Proposal

Master Thesis Research Proposal – A Simple One-pager Abstract
IMC University of Applied Sciences, Krems
Author – David Bobek
Title – SAIL: A Scalable AI Lifecycle Framework for Coordinated AI Adoption in Software Organizations
Purpose – The purpose of this paper is to develop and evaluate SAIL, a structured framework that enables software
organizations to adopt AI in a coordinated, scalable, and reusable manner. The expected outcome is a plug-and
play AI adoption model with clear guidelines for use case mapping, staged implementation (Awareness → Pilot
→ Scale → AI-Native), governance, and cross-team reuse—providing practical value for CTOs, engineering leads,
and innovation managers.
Research gap – While literature addresses enterprise architecture (Bernard, 2012), Digital Transformation (Warner
& Wäger, 2019), innovation diffusion (Rogers, 2003), dynamic capabilities (Teece, 2007), and resource-based
view (Barney, 1991), there is no integrated, use-case-driven framework designed specifically for scalable AI
adoption across software teams. Existing models focus on isolated AI pilots or generic transformation strategies,
lacking mechanisms for coordination, reuse, and progressive scaling. This study fills that gap by proposing and
conceptually validating SAIL as a practical, theory-informed framework tailored for software organizations.
Research question – How should AI adoption in software organizations be structured to ensure scalability,
coordination, and reusability across diverse use cases?
Theoretical lens – The study is grounded in five key theoretical foundations: (1) Enterprise Architecture (EA)
(Bernard, 2012) for systemic integration; (2) Digital Transformation (Matt et al., 2015) for organizational readiness; (3) Innovation Diffusion Theory (Rogers, 2003) to understand adoption dynamics; (4) Dynamic
Capabilities (Teece, 2007) for strategic agility in sensing, seizing, and transforming AI opportunities; and (5)
Resource-Based View (RBV) (Barney, 1991) to treat AI assets (models, data, knowledge) as valuable, rare, and
hard-to-imitate resources. These lenses collectively inform SAIL's design and evaluation.
Design/methodology/approach – This research follows a conceptual, theory-driven methodology using design
based research (Hevner et al., 2004). The approach includes: (1) a comprehensive literature review synthesizing

theories on AI adoption and organizational change; (2) framework development defining SAIL's pillars (use case
identification, adoption staging, governance, implementation roles, evaluation & reuse); and (3) conceptual
evaluation through theoretical application to realistic AI use cases (e.g., code generation, documentation
automation, sprint planning). For each use case, I will outline step-by-step how SAIL guides: identification →
prioritization → pilot design → scaling path → governance → reuse. This demonstrates SAIL's internal coherence,
scalability, and practical utility without primary data collection.
Time plan – Submit proposal: End of this week
• Finish literature review and start empirical part: By the end of September
• Submit your master thesis: By the End of the year
Expected challenges & limitations – As a conceptual study, the main limitation is the absence of real-world
validation. However, the use case walkthroughs are designed to simulate realistic organizational contexts,
enhancing practical plausibility. A key challenge is ensuring the framework remains both theoretically rigorous
and accessible to practitioners, which will be addressed through iterative refinement and alignment with industry
relevant examples.

Master Thesis

Title: SAIL – A Scalable AI Lifecycle Framework for Coordinated AI Adoption in Software Organizations
Author: [Your Name]
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Institution: IMC University of Applied Sciences, Krems
PROF **Date:** [Month, Year]

- Expected impact for academia and practice.

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6. Use Case Walkthroughs
7. Conclusion & Future Work
   References
   Appendices

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1. Introduction

1.1 Background

- Role of AI in modern software organizations.
- Industry applications (development, project management, decision-making).
- Drivers of adoption (efficiency, cost reduction, innovation).
- Pressures: regulatory, competitive, customer expectations.

SAIL – A Scalable AI Lifecycle Framework for Coordinated AI Adoption in Software Organizations

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Abstract

- Purpose and research problem
- Research gap in AI adoption frameworks
- Theoretical lenses applied
- Methodology (Design Science Research)
- Key contributions (framework + evaluation)
- Expected impact for academia and practice

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- Fragmented AI initiatives; isolated pilot projects.
- Lack of scalability and systematic governance.
- Coordination issues across departments/teams.
- Risks: inefficiency, duplication, lack of standardization.

1.3 Research Gap

- Existing frameworks address transformation broadly but not AI adoption specifically.
- AI maturity models focus on levels, not lifecycle coordination.
- Limited guidance on reuse and knowledge transfer across teams.
- Need for an integrated, lifecycle-based adoption framework.

1.4 Research Question and Objectives

- *RQ: How should AI adoption in software organizations be structured to ensure scalability, coordination, and reusability across diverse use cases?*
- Objectives:
    - Develop SAIL framework.
    - Integrate multiple theoretical lenses.
    - Apply framework to use case walkthroughs.
    - Highlight theoretical and practical contributions.

1.5 Structure of the Thesis

- Overview of chapters and flow of arguments.

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2. Literature Review

In order to ground the SAIL framework in established theory, this chapter will focus on the current state of research across five key theoretical lenses relevant to AI adoption in software organizations. The concept of AI adoption is multifaceted, involving technological, organizational, and strategic dimensions. The main challange is the lack of an integrated framework which is addressing the concept of "Full Lifecycle" adoption of AI in a coordinated and scalable manner. The aspect of AI being a very new technology, hinders the existence of established frameworks and supportive literature. Therefore, this chapter will rather review individual theories and models that are going to be synthesized later throughou the theoretical framework chapter.

2.1 Enterprise Architecture and AI Integration [REF]

In order to ground the SAIL framework in established theory the focus on Enterprise Architecture (EA) is crucial. Enterprise Architecture is providing a holistic approach to the problem of aligning IT with business strategy and goals. The principle of EA and its utilization in organizations is well documented in literature [REF]. However the not so well pointed out aspect is the type of company to which EA is applied. Different types of companies have different needs and requirements and technological readiness. Software organizations are typically more agile and introduction of major changes is easier to implement and does not create a lot of resistance. In contrast to this, traditional industries such as manufacturing or banking are more rigid and changes are harder to implement, thus EA frameworks in these industries are more rigid and bureaucratic.

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EA does not work as a silver bullet and it is not solving all problems by itself. There are several frameworks and methodologies which are used in practice. The most well known and implemented in companies are the frameworks are The Open Group Architecture Framework (TOGAF) and Zachman Framework. The mentioned frameworks are the current state of the art in EA and are widely used in practice. Each of the frameworks has its strengths and weaknesses and the choice of the framework depends on the context of the organization.
TOGAF being more dominant in the cases where the organization is more agile and dynamic, while Zachman Framework is more suitable for traditional and rigid organizations.

In the current Digital Transformation era, TOGAF is more suitable as more and more organizations are becoming agile and dynamic and the usage of AI can be implemented in a way that is more aligned with

TOGAF principles while still keeping the structure and rigor of EA. The usage and value extraction of AI in organizations is not a trivial task and it requires a structured approach. EA can provide the necessary structure and rigor to ensure that AI initiatives are aligned with business strategy and goals.

EA is therefore crucial for AI integration and scaling :

- It alligns AI initiatives with business strategy, ensuring that isolated pilots are connected to broader organizational goals and prevents existance of "siloed" AI projects.
- It provides a systemic view of the organization while having established governance mechanisms, which is crucial for managing the complexity of AI adoption across multiple teams and departments.
- It facilitates reuse of AI assets (models, data, knowledge) across teams by establishing common standards and repositories, thus preventing duplication of efforts and promoting efficiency.

On contrast the framework of Zachman is more rigid and bureaucratic and it is not so suitable for the dynamic nature of AI adoption. The Zachman points out that the architecture is a schema for organizing architectural artifacts (for example, design documents, specifications, and models) that takes into account both who the artifact targets (for example, business owner and builder) and what particular issue (for example, data and functionality) is being addressed. The Zachman framework is more suitable for traditional and rigid organizations where changes are harder to implement. The usage of AI in such organizations is more challenging as the adoption of AI requires a more agile and dynamic approach.

Both of the frameworks have their strengths and weaknesses and the choice of the framework depends on the context of the organization. However, for the purpose of this thesis, TOGAF is more suitable as it is more aligned with the principles of Digital Transformation and AI adoption.
Both of them were developed in the times of "pre-AI" era and therefore do not address the specific challenges and requirements of AI adoption. However, the principles and concepts of EA can be adapted and extended to address the specific needs of AI adoption in software organizations.
The SAIL framework will therefore build upon the principles of EA and adapt them to the specific context of AI adoption in software organizations.

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2.2 Digital Transformation and Organizational Readiness [REF]

The concept of Digital Transformation is closely related to the adoption of AI in organizations. Digital Transformation refers to the integration of digital technologies into all areas of a business, fundamentally changing how the organization operates and delivers value to customers. Year by year, more and more organizations are undergoing Digital Transformation in order to stay competitive in the market and the prevalence of AI is only amplifying this successful digital revolution. The proof of the fact that Digital Transformation is in fact a successful concept can be seen by comparing the amount of companies which have undergone Digital Transformation in the last decade and the revenue growth of these companies. The companies which have undergone Digital Transformation have seen a significant increase in revenue and market share, while the companies which have not undergone Digital Transformation have seen a decline in revenue and market share [REF].

The success of Digital Transformation can be observed in the performance of companies that have succesfully embraced it compared to those that have not. Firms that have implemented Digital

Transformation strategies report significantly stronger revenue growth and improved market share. Companies that are more digitally mature are up to 2.5 times more likely to see double-digit revenue growth than their less mature peers [REF]. Deloitte also says that digitally mature companies see an average revenue growth of about 45%, while less mature companies only see about 15% growth [REF]. BCG further highlights that successful transformations yield 15–25% increases in revenue and substantial efficiency gains [REF].

These results show that Digital Transformation is not just a theory; it is a real way to gain a competitive edge. As AI technologies become more and more a part of Digital Transformation, they are expected to help businesses make more money, run more smoothly, and stay strong over time.

Proof of Digital Transformation success:

- McKinsey (2021, 2023 updates): Companies that successfully undergo digital transformation are 2.5x more likely to report double-digit revenue growth compared to peers that lag behind in digital adoption【source: McKinsey Digital】.
- Deloitte (2023): Digitally mature companies achieve ~45% revenue growth on average , compared to ~15% growth for less mature companies【source: Deloitte Insights】.
- BCG (2020–2023 studies): Only about 30% of digital transformations succeed, but those that do deliver 15–25% increases in revenue and 30%+ improvement in operational efficiency【source: BCG Digital Acceleration Index】.
- Harvard Business Review (2022): Companies that invested heavily in AI and digital transformation were 5x more likely to gain market share than laggards【source: HBR – "Driving Digital Transformation with AI"】.

Regarding AI adoption, Digital Transformation provides several lessons:

- Organizational readiness is crucial. Successful Digital Transformation requires not just technology but also changes in culture, skills, and processes. Similarly, AI adoption needs organizational readiness to manage change effectively.
- Maturity models can guide progression. Digital Transformation maturity models outline stages from initial experimentation to full integration. AI adoption can benefit from similar staged approaches to manage complexity and scale effectively.

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The implementation of AI in organizations very much depends on the readiness of the organization to embrace change. This change comes in different forms, such as changes in culture, skills, and processes but also in the current technological infrastructure of the company and its ability to integrate new technologies. Challanges such as lack of permissions, lack of skills, lack of understanding of the technology and its potential, lack of resources and budget are all common barriers to the adoption of AI in organizations. These barriers can be overcome by following a structured approach to AI adoption, which is the main purpose of the SAIL framework. This would allow companies to overcome the barriers and successfully implement AI in their organizations and show them the standardized way of doing so and thus increase the chances of success while outlining which fields of the organization need to be changed in order to successfully implement AI.

The broad term of organizational readiness can be measured through different maturity models. The most well known and widely used maturity model is the Digital Maturity Model (DMM) developed by Deloitte. The DMM outlines five stages of digital maturity:

1. Initial: Ad hoc and uncoordinated digital initiatives.
2. Developing: Some digital initiatives, but still siloed and uncoordinated.
3. Defined: Digital initiatives are defined and coordinated across the organization.
4. Managed: Digital initiatives are managed and measured for impact.
5. Optimized: Digital is fully integrated into business strategy and operations.

In order to successfully implement AI in organizations, the assumption of high level of digital maturity is crucial. The higher the level of digital maturity, the higher the chances of success in implementing AI in organizations. The SAIL framework will therefore build upon the principles of Digital Transformation and adapt them to the specific context of AI adoption in software organizations.

2.3 Innovation Diffusion Theory [REF]

Innovation Diffusion Theory (IDT), developed by Everett Rogers, provides a valuable lens for understanding how new technologies, such as AI, are adopted within organizations. This theory is particularly relevant in the context of AI adoption in software organizations, where the pace of rapid industry change and technological advancement creates both opportunities and challenges for adoption.

IDT become relevant in the context of technology adoption in organizations. The theory outlines how innovations are communicated over time among the members of a social system. The key elements of IDT include the innovation itself, communication channels, time, and the social system. The rise of usage of IDT is closely related to the rise of technology adoption in organizations and the recognition that successful adoption of new technologies requires more than just the technology itself; it also requires effective communication and social dynamics within the organization.

Perfect example where IDT was successfully applied is in the Israeli tech sector, where early adopters in startups and tech companies drove the initial adoption of AI technologies, leading to broader acceptance across the industry. This diffusion was facilitated by strong networks and knowledge sharing among innovators and early adopters, which helped to build trust and demonstrate the value of AI. Thus creating a country which swiftly became the "Startup Nation" and a global leader in AI innovation while having an insignificant population of only 9 million people and the amount of AI startups per capita being the country with the highest number worldwide【source: Startup Genome Report 2023】.

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The key components of IDT include:

- Innovation: The acceptance of AI technologies as a new innovation within the organization.
- Communication Channels: The methods through which information about AI is shared within the organization (e.g., meetings, workshops, internal communications).
- Time: The duration over which AI adoption occurs, including the stages of adoption.
- Social System: The organizational culture and structure that influence how AI is perceived and adopted.

These key components were laid out in Rogers' seminal work "Diffusion of Innovations" (2003) more than two decades ago, but they remain highly relevant in today's context of rapid technological change and AI adoption. The ability to understand and leverage these components is crucial for successful AI adoption in software organizations. Each of these components plays a critical role in shaping the adoption process and determining the success of AI initiatives.
By following the principles of IDT, organizations are able to effectively manage the adoption process, address resistance, and build momentum for AI initiatives, while still being aware of the risks and challenges associated with AI adoption. The SAIL framework will therefore incorporate insights from IDT to guide the scaling strategies for AI adoption in software organizations.
The effective usage of IDT in organisations can be implemented through the following steps:

1. Start with innovators and early adopters: Identify and engage individuals or teams within the organization who show a strong interest in AI and are willing to experiment with new technologies. This will naturally create champions for AI adoption. The most important aspect is to identify the right people who are willing to experiment and take risks and give the people the freedom to do so. This will create a culture of innovation and experimentation within the organization.

2. Leverage communication channels: The usage of effective communication channels is crucial for spreading awareness. The spark that was created by the innovators and early adopters needs to be spread across the organization and let the fire of innovation spread. The most effective ways to do so are through company wide presentantions, demos, workshops and upper management support. The communication needs to be clear and concise and the benefits of AI adoption need to be highlighted.

3. Address concerns and resistance: It is natural for people to be resistant to change, the natural human behavior is to resist change and stick to the status quo. Therefore the emphasize on addressing concerns and resistance is crucial. This is done by creating a level of trust and transparency. The concerns of employees need to be addressed and the benefits of AI adoption need to be highlighted. For the successful adoption of AI the value proposition needs to be clear and the benefits need to outweigh the risks.

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4. Build a supportive social system: Organizational culture and structure play a crucial role in shaping how AI is perceived and adopted. This means that the culture of the organization needs to be supportive of innovation and experimentation. By fostering a culture that is exploratory and innovation driven we can create an environment where AI adoption can thrive. The kernel of the culture needs to allign with the long term mission and vision of the organization which at the end needs to be AI-Native.

By following the principles of IDT, organizations have a clear way to manage the adoption process, address resistance, and create a momentum where AI is embraced and incorporated into the culture which the SAIL framework will build upon.

2.4 Dynamic Capabilities Theory [REF]

Dynamic Capabilities Theory (DCT), introduced by David Teece, provides a valuable framework for understanding how organizations can adapt and thrive in rapidly changing environments such as the current AI landscape which is mostly characterized by extremely fast technological advancements and

changes. DCT as a theory is particularly emphasizing the importance of an organization's ability to sense, seize, and transform in order to maintain a competitive advantage. The winner is not the strongest or the most intelligent, but the one who is most adaptable to change while still achieving a sustained competitive advantage. DCT was origanlly developed in the context of strategic management and organizational theory, but its wide adoption in the tech and software industry is closely related to the rapid pace of technological change and the need for organizations to become more agile, adaptive and innovative in order to stay competitive.

DCT consists of three main components:

1. Sensing: The ability to identify and assess opportunities and threats in the external environment.
2. Seizing: The ability to mobilize disposable resources to capture value from opportunities.
3. Transforming: The ability to continuously renew and realign organizational processes and structures to adapt to changing environments while still maintaining operational efficiency.

The winners in the modern digital economy are those who can quickly sense new opportunities, seize them effectively, and transform their organizations to stay ahead of the competition. These 3 simple steps might seem trivial, but they are the key to success. This type of mental allignment will be extremely relevant for the successful adoption of AI in organizations. By not following these principles, organizations risks moving and operating outside of their core competencies and thus deviating from their core mission and vision. Having a clear 3 step approach helps the organization to stay focused and aligned while still being able to reflect and adapt to the changing environment.

DCT can be used in both small and large organizations, but the implementation might differ. In small organizations, the decision-making process is typically more centralized, allowing for quicker sensing and seizing of opportunities. On the other hand the lack of available and disposable resources might hinder the ability to seize opportunities effectively and thus leading to a more visionary mindset instead of an operational one. In large organizations, the decision-making process is typically more decentralized and complex, which in most cases leads to slower sensing and seizing of opportunities. The advantage of large organizations is the availability of resources which allows them to seize opportunities more effectively and while not being as visionary as small organizations, they are more operationally efficient and the ability to transform and capitalize on opportunities is higher.

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The usage of DCT can be perfectly showcased on an rather succesful startup from the heart of Tel Aviv called "Waze". Waze was founded in 2006 and was acquired by Google in 2013 for $1.1 billion. The success of 3 Jewish founders Ehud Shabtai, Amir Shinar, and Uri Levine can be attributed to their ability to sense the opportunity of real-time traffic information, seize the opportunity by developing a mobile app that leveraged user-generated data, and transform the organization by continuously updating and improving the app based on very crucial user feedback【source: Waze History】[REF].

2.5 Resource-Based View (RBV) and AI Assets [REF]

- VRIN framework: data, algorithms, expertise as resources.
- Building sustained competitive advantage through AI.
- Risks of resource imitation or commoditization.

2.6 Related AI Adoption Models [REF]

The AI adoption models that are currently existing in literature and practice are mostly focused on the maturity of AI adoption in organizations. These models are typically structured around different levels of maturity and their intended use is to help organizations assess their current state of AI adoption and identify areas for improvement. This is a very useful approach, which can help organizations where to start and what are the prerequisites for successful AI adoption. However, these models are mostly focused on the maturity of AI adoption and do not provide a structured approach to the actual adoption process itself. This is the research and market gap where the SAIL framework is trying to fill in. The most well known and widely used AI maturity models are the following:

1. AI Maturity Model by Deloitte: This model outlines five levels of AI maturity, from "Ad Hoc" to "Optimized". It focuses on areas such as strategy, governance, data management, and talent. The model is useful for assessing the current state of AI adoption but does not provide a structured approach to the adoption process itself【source: Deloitte AI Maturity Model】.
2. AI Maturity Model by PwC: This model also outlines five levels of AI maturity , from "Initial" to "Transformational". It emphasizes the importance of culture, leadership, and change management in addition to technical capabilities. Similar to the Deloitte model, it is useful for assessment but lacks a structured adoption process【source: PwC AI Maturity Model】.
3. AI Maturity Model by Gartner: This model outlines four levels of AI maturity, from "Experimentation" to "Transformation". It focuses on areas such as strategy, governance, data management, and talent. The model is useful for assessing the current state of AI adoption but does not provide a structured approach to the adoption process itself【source: Gartner AI Maturity Model】.
4. AI Maturity Model by Forrester: This model outlines five levels of AI maturity, from "Ad Hoc" to "Optimized". It emphasizes the importance of culture, leadership, and change management in addition to technical capabilities. Similar to the Deloitte model, it is useful for assessment but lacks a structured adoption process【source: Forrester AI Maturity Model】.
   These models are certainly useful for organizations in order to approach the topic of AI adoption and understand where they currently stand. Every company and business operating in the market needs to start somewhere and these models provide a good starting point. However, the main question is still opened and that is "What next?" and "How to actually implement AI in a structured way?". This question is still not answered by the existing models and is the most crucial one as the actual conversion of the theoretical knowledge into practical implementation is the most challenging part, but is the only part which actually creates value. Staying too long undercover with reasearch gets you only as far as the size of the company's budget allows you to go. The actual implementation and value creation is the only thing which will make the company successful in the long run. The purpose of the SAIL framework is to convert the theoretical knowledge into practical implementation and provide a structured approach to the adoption process itself. While focusing on mostly internal aspects of the organization and efficiency, resulting in reduction of overhead costs and increase of productivity.

2.7 Synthesis and Identified Gaps

- Comparative analysis across theories and models.
- Explicit statement of gaps.
- Justification for creating SAIL.

In order to properly justify the creation of the SAIL framework it is crucial to identify the gaps in the current approaches and frameworks outline in the previous chapters.

The identified gaps include:

- Lack of lifecycle orientation: The current models which are existing are not providing an approach which is covering the entire lifecycle of AI adoption, from the early initial awareness until the late stages of full integration and being AI-Native.
- Insufficient focus on coordination: Models which are currently out in the market are not giving a proper emphasis on the coordination of AI initiatives across different teams and the knowledge transfer between them. This is leading to fragmented and siloed efforts which are not creating the desired value.
- Neglection of "Reuse Mechanisms": Reuse of AI assets (models, data, knowledge) is not being properly addressed in the existing frameworks. The ability to reuse AI assets across various teams and projects is crucial for efficiency and scalability which often leads to effort duplication and inefficiency
- Holistic integration of theoretical lenses: While certain individual theories are providing valuable insights, the holistic approach of integrating these insights into a cohesive framework is missing.
- Practical applicability: Many of the existing models are theoretical and are only observant in nature and lack practical guidelines for implementation in real-world organizational contexts. The "call to action" is missing.
- Scalability challenges: Scalability is a crucial aspect of AI adoption, especially in large organizations with multiple teams and departments. It often serves as the hindrance for successful AI adoption as local usage in a team is not being scaled across the organization.

The identified gaps are the building blocks for the development of an approach which is addressing lifecycle orientation, coordination, reuse, holistic integration of theoretical lenses, practical applicability and scalability challenges. Framework which is able to encompass all of these aspects will be the first of its kind and will provide a significant contribution to both theory and practice. Such a framework does not only fills the existing gaps but also provides a structured approach to AI adoption that is both theoretically informed and practically applicable. The outcome of this synthesis is the justification for creating the SAIL framework, which aims to address these gaps and provide a comprehensive solution for AI adoption in software organizations.

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In order to properly visualize the synthesis of the different theoretical lenses and existing models, a comparative table is created. This table outlines the key components of each theory and model, highlighting areas of overlap and divergence. The table also identifies the specific gaps that SAIL aims to address, providing a clear rationale for its development.

Theoretical Lens / Model	Key Components	Overlaps with SAIL	Divergences from SAIL	Identified Gaps Addressed by SAIL

Theoretical Lens / Model	Key Components	Overlaps with SAIL	Divergences from SAIL	Identified Gaps Addressed by SAIL
Enterprise Architecture (EA)	Alignment of IT with business strategy; systemic integration; governance; TOGAF & Zachman frameworks.	Provides structure for aligning AI with strategy; governance mechanisms support coordination.	EA developed in pre-AI era; lacks explicit lifecycle focus and reuse mechanisms.	Adds lifecycle orientation, AI-specific governance, and reuse of assets across projects.
Digital Transformation (DT)	Integration of digital technologies; cultural and organizational readiness; maturity models (Deloitte DMM).	Provides staged adoption maturity models; highlights readiness as key success factor.	Focuses broadly on digital change, not AI-specific challenges.	Tailors maturity concepts to AI lifecycle; adds detailed adoption steps beyond general digital readiness.
Innovation Diffusion Theory (IDT)	Adoption curve (innovators → laggards); communication channels; social systems.	Provides lens for understanding AI adoption dynamics; role of innovators/early adopters.	Focused on diffusion, not organizational coordination or reuse.	Adds mechanisms for organizational scaling, coordination, and cross-team knowledge reuse.
Dynamic Capabilities Theory (DCT)	Sensing, seizing, transforming; adaptability in dynamic environments.	Provides agility lens for AI adoption and scaling; emphasizes transformation.	Does not provide structured process for AI lifecycle adoption.	Embeds sensing–seizing–transforming into AI lifecycle stages with concrete governance and processes.
Resource-Based View (RBV)	VRIN resources (valuable, rare, inimitable, non-substitutable); focus on data, algorithms, expertise.	Highlights data and AI models as strategic resources; underpins value creation logic.	Lacks process orientation; focuses on resources rather than adoption mechanisms.	Adds structured lifecycle for capturing, reusing, and leveraging AI resources across the organization.

Theoretical Lens / Model	Key Components	Overlaps with SAIL	Divergences from SAIL	Identified Gaps Addressed by SAIL
AI Maturity Models (Deloitte, PwC, Gartner, Forrester)	Staged assessment of AI readiness and maturity across dimensions (strategy, governance, data, talent).	Useful diagnostic tools; provide starting point for adoption journey.	Static assessment focus; no step-by-step lifecycle or reuse strategies.	Adds structured lifecycle roadmap; ensures adoption beyond maturity assessment into implementation.

This comparative analysis clearly demonstrates the unique value proposition of the SAIL framework. By integrating insights from multiple theoretical lenses and addressing the specific gaps identified in existing models, which SAIL aims to fill.

The gap of not having the structured approach to the entire AI adoption lifecycle, from initial awareness to full integration is addressed by SAIL through its clearly defined stages of adoption (Awareness → Pilot → Scale → AI-Native).

3. Theoretical Framework

The following chapter will outline the theoretical framework of SAIL. Answering the questions like "Why does SAIL exist?", "What theoretical foundations is it built upon?" and "How do these theories inform the design of the framework?". The goal of this chapter is to provide a clear understanding of the theoretical underpinnings of SAIL and how are these theories being integrated into a cohesive framework.

3.1 Conceptual Foundations of SAIL

- Purpose of a lifecycle adoption framework.
- Positioning relative to Digital Transformation and EA.
- Addressing fragmentation through coordination and reuse.

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In order to properly understand the conceptual foundations of SAIL, it is extremely crucial to understand the purpose of a lifecycle adoption framework. The main purpose of SAIL and any lifecycle adoption framework is to provide a holistic and structured approach for a set of activities, in this case the adoption of AI in a coordinated and scalable manner. This aspect of lifecycle orientation is crucial as it is not narrowly focused on a single aspect of the adoption process, but looks on the landspace from an overarching perspective. The lifecycle orientation can be understood as a series of stages that an organization goes through in order to successfully adopt and integrate AI into its operations while approaching the topic from a comprehensive perspective.

3.1.1 Purpose of Scalabile Artificial Intelligence Lifecycle (SAIL)

The purpose of Scalabile Artificial Intelligence Lifecycle (SAIL) is to create a structured and systematic approach for software organizations to adopt, scale, and integrate AI technologies effectively. SAIL is

aiming to serve as a roadmap that guides organizations through the complex journey of AI adoption and integration, ensuring that AI initiatives are aligned with business objectives, coordinated across teams, and capable of delivering sustained value.

SAIL framwework will not serve as a rigid prescription, but as a practical playbook which will provide actionable steps for enterprises to follow. It will not be a theoretical model. It will not be a true "one-size-fits-all" solution. It will not be an assesment model. It will not be a maturity model. It will not be a diagnostic tool.

It will be a lifecycle-based roadmap outlining the stages of AI adoption, from initial awareness to full integration and being AI-Native, while staying true to solving the identified gaps and use cases in the operational context of the organization.

Enterprises are currently standing in front of a major technological shift, where AI is swiftly becoming a core component of business strategy and operations. The ability to effectively exploit and leverage this technology is becoming a key determinant of competitive advantage.

Efficiency is not secondary and innovation is not a luxury, but a necessity for survival in the modern digital economy. Being second is equivalent to being last.

3.1.2 Positioning Relative to Digital Transformation and Enterprise Architecture

While SAIL is conceived as an independent framework, it lies at the confluence of Digital Transformation and Enterprise Architecture (EA). To ensure that AI initiatives remain consistent with corporate strategies and organizational objectives, SAIL must rest on the principles of both Digital Transformation and EA.

Whereas companies will not transform themselves to fit the SAIL framework, the framework itself must adapt to the organizational context and structural realities. By applying EA principles, SAIL guarantees that AI initiatives are embedded within the larger enterprise architecture rather than developed in isolated silos. Since such global alignment is indispensable, it provides the foundation for scalability and acts as the enabler of coordination across organizational teams.

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3.1.3 Addressing Fragmentation through Coordination and Reuse

Even when organizations produce strong ideas or embrace advanced technologies, such efforts inevitably fail without a clear coordination mechanism. Because coordination is frequently overlooked prior to innovation, promising concepts often remain unrealized, become fragmented, or duplicate existing efforts, thereby undermining potential synergies. By embedding coordination at the very outset of AI adoption, organizations establish the conditions for effective integration and sustainable scaling of AI initiatives.

Although AI adoption often appears to originate at the top, in reality it begins at the operational level, where individuals experiment with technology and emerge as its earliest champions. Only when senior management creates the necessary environment and allocates appropriate resources can these bottom-up innovations thrive. Since coordination and information exchange serve as the glue of the adoption process, they ensure alignment, integration, and synergy across organizational activities.

The conceptual foundations of SAIL will be built upon theoretical lenses which will be outlined in the following chapter.
They will each provide a beneficial and crucial part of the puzzle and will be carefully integrated into the design of the framework.

3.2 Integration of Theoretical Lenses

- EA → systemic integration.
- Digital Transformation → readiness and strategic alignment.
- Innovation Diffusion → adoption dynamics across teams.
- Dynamic Capabilities → agility in scaling and transformation.
- RBV → AI as strategic assets.

Integration as a business process is the act of coupling different systems and processes together in order to seize value and synthesize a final form of the product. This type of synthesis involves cherry-picking the best parts of each individual component and linking them together in order to compliment each other and create a more valuable system.

SAIL framework will be built upon the integration of the theories analysed in the chapter of Literature Review, where the analysis of the existing literature and a brief introduction of the concepts was conducted. The answer which needs to be provided is how these theories support the design of the framework.

3.2.1 EA and SAIL

Enterprise Architecture (EA) will be the backbone of the creation of the SAIL framework. EA can be understood as the practice of analyzing, designing, planning, and implementing enterprise analysis in order to execute on business strategies. As SAIL framework is aiming to provide a structured approach to the adoption of AI in organizations, the similiarity of the outlined set of processe can not be overlooked. This approach in enterprise architecture is crucial for not only setting up initial organisation when going through the adoption process, but also whenever enterprises are scaling or implementing new technologies or processes. Regarding EA as already mentioned SAIL will focus more on the model of TOGAF as it is more flexible and adaptable to the current technological landscape and SAIL is expected to be more implementation oriented and practical especially in the context of digital business and companies which have started their digital transformation journey and are lookging to implement AI in their operations. SAIL will need to be aligned with the existing enterprise architecture of the organization and most importantly will need to complement it. The principles of a succesful EA will be the guiding principles for the design of SAIL and will need to truly ensure that AI will not act as a disruptive force, but rather as a true enabler of efficiency and innovation.

3.2.2 Digital Transformation and SAIL

Digital Transformation consists of the integration of digital technologies into all areas of a business, while fundamentally changing how the business operates and delivers value to customers. Digital Transformation is a major step for businesses which are not yet connected to the digital world and are still operating in a traditional way. Not every single business is required to undergo a digital transformation, but for those who do, it is a major step which requires a lot of resources and

commitment. The root principle of Digital Transformation is the ability to not only adapt and embrace new technologies, but also to change the work culture in which the business and the teams whithin the business operate. This might be a challenging task, as it requires a lot of change management and the ability to overcome resistance. The SAIL as a framework will have the presumption that the organization is already digitally mature and has already undergone a digital transformation. By targeting digitally mature organizations, SAIL will be able to focus on the actual adoption of AI and not on the prerequisites which are required for a successful adoption. This will lead to efficient and streamlined internal process rollout and not wasting resources on the prerequisites. This also rules out the risk of failure due to lack of readiness and thus increases the chances of success. The principles of Digital Transformation are still going to hand in hand with SAIL, as SAIL will not be acting as a digital transformation framework, but rather as an AI transformation framework which is complementing the existing digital transformation efforts of the organization.

3.2.3 Innovation Diffusion Theory and SAIL

Innovation Diffusion Theory (IDT) is a theoretical framework which explains how, why, and at what rate new ideas and technology spread through cultures. The ideology underlying IDT and SAIL is innovation and the adoption of new technologies. The principles of IDT will be crucial for the design of SAIL, as it will provide a clear understanding of how AI adoption is happening in organizations and what are the key factors which influence the adoption process. From early adopters to laggards, the principles of IDT will be taken into consideration when discussing and implementing the collaboration and coordination mechanisms of SAIL. The principles of communication channels, social systems, and time will be crucial for the design of SAIL and its stages of adoption will be inspired by the IDT framework. SAIL will encompass the principles of IDT regarding reuse and knowledge transfer between teams and will provide a clear roadmap for the adoption process. IDT supports SAIL as SAIL is based on innovation and is one of its core principles. The innovation aspect in SAIL is the use case driven approach, where the adoption is driven by the actual use cases and their value proposition. This is a crucial aspect as it ensures that the adoption is not happening in a vacuum, but is driven by the actual needs of the organization.

3.2.4 Dynamic Capabilities Theory and SAIL

Dynamic Capabilities Theory (DCT) is a theoretical framework which is explaining how organizations can adapt and thrive in rapidly changing environments. DCT and SAIL are closely related as SAIL will integrate the 3 main components of DCT into its design and those being the sensing, seizing, and transforming. SAIL will be starting with the sensing of opportunities, where the organization will need to perform a short analysis and audit on the gaps which they will be need to fill in order to successfully adopt AI. This will be followed by the seizing of opportunities and prepare a framework which will serve as a benchmark for the actual adoption process. The final step will be the transforming of the organization, where efficient communication and implementation of the framework will be crucial for the success. The principles of DCT are in fact very crucial and relevant for the SAIL framework as they will inspire the design of the framework and SAIL will build upon the principles of DCT in order to provide a structured approach to the adoption process. The ability to sense, seize, and transform will be crucial for the success of the adoption process and will be the guiding principles for the design of SAIL.

3.2.5 Resource-Based View and SAIL

Resource-Based View (RBV) serves as an actor in the process of internal business analysis and strategy formulation. RBV focuses on the internal resources of the organization as the primary source of competitive advantage. The principles of RBV deeply aligns withe the principles of SAIL, as SAIL will be focusing on the internal resources of the organization and how to leverage them in order to successfully adopt AI and where AI becomes an internal digital product and a strategic asset. While not only staying passive as an asset but becoming an active resource in the disposable of the company to transofrm and adapt to the changing environment. The principles of VRIN (valuable, rare, inimitable, non-substitutable) will be crucial for the design of SAIL, as the internal digital products which the new AI initiatives will create need to be aligned with the principles of VRIN in order to provide a sustained competitive advantage. The principles of RBV will be crucial for the design of SAIL, as they will provide a clear understanding of how to leverage the internal resources of the organization in order to successfully adopt AI and create value.

3.3 Principles Derived for Framework Design

The outcome of the synthesis of the theoretical lenses and the conceptual foundations of SAIL will be the derivation of the key principles which will guide the design of the framework. These principles will be crucial for the success of the adoption process and will ensure that the framework is aligned with the theoretical underpinnings. The key principles which will guide the design of SAIL are:

- Scalability: Scalability acts as a principle of the framework, as it will ensure that the adoption process is not happening in a vacuum and will be able to outgrow the initial adopters working on the AI solution during their pilot phase. The ability to scale the adoption process across different teams and departments will be crucial for the success of the adoption process and will ensure that the AI initiatives are able to deliver sustained value. Scalability will be achieved through the use of coordination mechanisms and reuse mechanisms which will be outlined in the following principles.
- Coordination: Coordination as an actor in the process has been already outlined in the previous chapter and will be crucial for the success of the adoption process as without a clear communication no message will be able to be delivered and the adoption process will fail with certainity. This polemical message is crucial for the design of SAIL and insisting on the importance of coordination will be the one of the most detrimental aspects of the framework.
- Value-driven use case prioritization: The adoption process will be driven by the actual use cases and their value proposition. This will be achieved by the initial DCT analysis which will be performed at the beginning of the adoption process by a small team of experts. The use cases will be prioritized based on their feasibility, impact, and alignment with the overall business strategy. This will ensure that the adoption process is not happening in a vacuum and is driven by the actual needs of the organization. The early adopters acting as the champions of the adoption process will be crucial for the success of the adoption process and will ensure that the AI initiatives are able to deliver sustained value.
- Mechanisms for capturing and reusing AI assets: The ability to capture and reuse AI assets (models, data, knowledge) remains as an important factor of the framework and the ability to repurpose AI
  initiatives and being able to branch from the initial use case will be very beneficial for the success of the adoption process as the teams will be able to save time and solve multiple usecase withe the same AI asset. This will ensure that the adoption process is not happening in a vacuum and

the AI asset will be able to deliver value accros multiple divisions and departments. The reuse mechanisms will be crucial for the success of the adoption process and will ensure that the AI initiatives are able to deliver sustained value.

4. Research Methodology

The upcoming chapter will focus on the research methodology which will be used for the development of the SAIL framework. This chapter will outline the research design, literature review approach, framework development process, and conceptual evaluation via use cases. Research methodology is a crucial aspect of any research project, as it is going to define and establish the credibility and validity of the research findings. The chosen methodology will be aligned with the research question and objectives, ensuring that the research is able to provide a solid an comprehensive answer to the research question of "How can software organizations effectively adopt and scale AI technologies through a structured lifecycle framework?".

4.1 Research Design – Design Science Research

This thesis is using the model called Design Science Research (DSR) as the research methodology. DSR is a research paradigm which is focused on the creation and evaluation of artifacts (models, methods, frameworks) in order to solve real-world problems. This thesis is focused on the creation of a conceptual framework (SAIL) that solves a real-world problem (AI adoption in software organizations). The DSR methodology is particularly well-suited for this research as it provides a structured approach for the development and evaluation of the framework. The target of this thesis is not literature review or empirical research, nor is it a metanalysis of existing frameworks. The primary and sole goal of this thesis is the resugence of a new framework which is able to solve the identified gaps and use cases in the operational context of the organization.

The DSR methodology consists of three main cycles: relevance cycle, rigor cycle, and design cycle. The relevance cycle is focused on the identification of the problem and the context in which the problem exists. The rigor cycle is primarily focused on the review of existing literature and theories in order to provide a theoretical foundation for the framework that is being developed. The last stage of the DSR methodology is the design cycle, which is focused on the actual development and evaluation of the framework. The last stage will be the most important one, as the actual process of pitching and outlining the framework will take place. The evaluation of the framework will be done through the use of realistic use cases, which will be outlined in the following chapter. The use cases will be used to evaluate the framework against multiple criteria, such as coherence, scalability, and reusability. The use cases will be selected based on their relevance to the research question and their ability to provide a comprehensive evaluation of the framework. The use cases will be based on realistic scenarios that software organizations might face when adopting and scaling AI technologies.

To adhere to the DSR methodology, the research will be conducted in a structured manner, following the three cycles outlined above.

4.1.1 Relevance Cycle

The relevance cycle will be focused on the identification of the problem and the context in which the problem exists. The problem of AI adoption in software organizations has been identified as a real-world problem that needs to be addressed. The context in which the problem exists is the software industry, which is rapidly evolving and adopting new technologies. The relevance cycle will also involve the identification of the stakeholders who are affected by the problem, such as CTOs, innovation managers, and engineering leads. The relevance cycle will provide a clear understanding of the problem and its context, which will inform the development of the framework. Relavance as a cycle will be outlined in the SAIL framework as the first stage of the adoption process, where the organization will need to perform a short analysis and audit on the gaps which they will be need to fill in order to successfully adopt AI. This will prove whether the organization is ready to adopt AI and will provide a clear understanding of the problem and its context, which will inform the development of the framework and therefore the relevance cycle is being integrated into the design of SAIL.

Connection of Relevance cycle to SAIL:

- SAIL is addressing fragmentation through coordination and reuse, which is a real-world problem that needs to be addressed.
- The Relevance cycle emphasizes on the importance of understanding the context in which the problem exists, and on the practical needs
- Use cases will act as a bridge between theory and practice, ensuring that the framework is relevant to the needs of software organizations.

The Relevance Cycle guided SAIL's development, by being able to identify the aoption challanges while ensuring that the framework is addressing the practical needs of software organizations.

4.1.2 Rigor Cycle

The goal of the rigor cycle is to provide a solid theoretical foundation for the framework that is being developed. The rigor cycle is involving the review of existing literature which was done in the chapter of theoretical frameworks where a thorough analysis of the existing literature and theories was conducted and its connection was established and the gaps were identified. By being able to connect the existing theories to the design of the framework, the rigor cycle increases on the validty as the framework is not being developed in a vacuum, but is based on solid theoretical foundations. Rigor cycle basis its foundational principles on the integration of multiple theoretical scopes and lenses into one meta-model which serves as the backbone of the framework. The principles derived from the synthesis of the theoretical lenses will be crucial for the design of SAIL, as they will provide a clear understanding of how to leverage the internal resources of the organization in order to successfully adopt AI and create value.

Connection of Rigor cycle to SAIL:

- Chapter of theoretical frameworks provided a solid theoretical foundation for the framework that is being developed.
- The listed theories of EA, Digital Transformation, IDT, DCT, and RBV serve as information sources for the design of SAIL.
- Ensures that SAIL is not arbitrary but is grounded in established knowledge.

The Rigor Cycle ensured that SAIL is grounded in established knowledge, by providing a solid theoretical foundation for the framework that is being developed.

4.1.3 Design Cycle

The design cycle or otherwise known as the build and evaluate cycle will be the cycle which lays its scope on the foundational principles of the SAIL framework. The design cycle is focused on the actual development and evaluation of the framework. The primary focus of this thesis is the development of the framework, which will be done in a structured manner, in the upcoming chapter. The evaluation of the framework will be done through the use of realistic use cases where each use case will be evaluated against multiple criteria and will be specified on how to overcome it in a structured manner. The use cases will be selected based on their relevance and the possibility of them occuring in a real-world scenario in the ambit of software organizations. The foundation of the model will be based on the principles derived from the synthesis of the theoretical lenses, however as it is a new framework, it would be unprofessional to limit the level of innovation and creativity by simple observing the existing theories. SAIL as a framework will be innovative and creative in its design, while still being grounded in established knowledge. While the theoretical lenses provide the foundation, the novel contributions of SAIL are a product of independent thought and design. This balance between theory and innovation is crucial for the success of the framework, as it ensures that the framework is both relevant and practical. By pushing the boundaries of existing knowledge, SAIL aims to provide a new and breakthrough approach to AI adoption in software organizations.

Connection of Design cycle to SAIL:

- The design cycle is focused on the actual development and evaluation of the SAIL framework which is the primary focus of this thesis.
- Use cases will be used in the evaluation process of the framework, ensuring that the framework is practical and relevant.
- While grounded in theory, SAIL incorporates innovative elements that extend beyond existing models.

The Design Cycle facilitated the creation of SAIL. It is inevitable that the design of SAIL will be innovative and creative, while still being grounded in established knowledge and the process of outlining followed by the evaluation of the framework will be done through the use of realistic use cases.

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4.2 Literature Review Approach

The question of why each of the theories was chosen and how they are connected to the design of SAIL was already answered in the chapter of theoretical frameworks, however in order to provide a clear understanding of the literature review approach, the following segment will elaborate on the search strategy, inclusion/exclusion criteria, and the process of synthesizing theory.

4.2.1 Search Strategy, Databases, Keywords

The search strategy for the literature review was focused on identifying relevant articles, models, and frameworks that are addressing the topic of AI adoption in software organizations, which is the primary focus of this thesis. The search was done over multiple databases, including Google Scholar, IEEE

Xplore, ACM Digital Library. These databases were helpful in providing a wide range of articles and models from both academic and industry sources. The search was not only limited to academic articles, but also included industry reports and whitepapers from leading consulting firms such as Deloitte, PwC, Gartner, and Forrester.

The problematic aspect of AI adoption as already mentioned is a very recent topic and therefore the most relevant and up-to-date information can be found either by direct reports of large consulting firms or in conference papers and articles or journals which are focusing on the topic of AI adoption and its challenges.

The keywords used in the search included combinations of terms such as "AI adoption", "Artificial Intelligence implementation", "Digital Transformation" and other outlined frameworks. Regarding the research on the already existing frameworks, the process was more straightforward as the frameworks are already established and therefore the search was more focused on finding the most relevant and up-to-date information about the frameworks and their principles.

4.2.2 Inclusion/Exclusion Criteria

The inclusion criteria for selecting articles and models were based on their relevance to the research question, publication date (preferably within the last 10 years to ensure contemporary relevance), however this was not a strict rule as some of the theories are older but still relevant such as the IDT. Inclusion of the articles was also based on their citation count, with a preference for highly cited works which indicates their influence and acceptance not only in the academic community but also in the industry.

4.2.3 Process of Synthesizing Theory

The process of synthesizing theory through the literature review involved a thorough analysis of the selected articles and models. The main motivation behind the synthesis was to identify the key principles and concepts that are relevant which are relevant in the context of AI adoption in software organizations. The main contribution of the synthesis was the identification of the gaps and the ideation process started with the cardinal question of "Where do existing frameworks fall short in addressing the challenges of AI adoption in software organizations?" This question was crucial for the design of SAIL, and the frameworks which are crucial and are the cornerstone of the design of SAIL. There were many more frameworks which were analysed, but the ones which were chosen are the ones which are most relevant and are truly the depiction of the vision of the SAIL framework. Frameworks which were not chosen were either too generic and did not provide any specific insights into the topic of AI adoption or were too specific and did not provide a holistic view of the adoption process. In the end the list of the theories which were chosen are the ones which are most relevant and are truly the foundation of the design of SAIL, both from the perspective of theory and practice.

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4.3 Framework Development Process

- Iterative design and refinement.
- Mapping theories to practical framework elements.

The framework development process will be based on an iterative design and refinement approach. Multiple iterations of this framework were done in order to ensure that the framework is practical and

relevant and the final version of the framework is the one which is able to solve the identified gaps and use cases in the operational context of the organization, which is the one that will be presented in the upcoming chapter.
This process of the development and the refinement of the framework was done in a structured manner, following the principles derived from the synthesis of the theoretical lenses. Each of the theoretical lenses defined in the chapter 3 will need to be connected to a realisitc part of th SAIL framework, otherwise the point of the chapter 3 is simply lost. The following segment will outline the mapping of the theories to practical framework elements.

- Enterprise Architecture (EA) → systemic integration: EA principles are guiding the design of SAIL to ensure that AI initiatives are embedded within the larger enterprise architecture rather than developed in isolated silos. The improtance of this theoretical framework will play part on effective integration and sustainable scaling of AI initiatives.
- Digital Transformation → readiness and strategic alignment: SAIL presumes that the organization which shall adopt the framework is already digitally mature and has already undergone a digital transformation. This leads to efficient and streamlined internal process rollout and not wasting resources on the prerequisites, such as data infrastructure and digital culture.
- Innovation Diffusion Theory (IDT) → adoption dynamics across teams: IDT does not only serve as the amplifier of the innovation aspect of SAIL and the use case driven approach, but still gives the framework a clear understanding of how AI adoption is happening.
- Dynamic Capabilities Theory (DCT) → agility in scaling and transformation: The principles of sensing, seizing, and transforming are guiding the design of SAIL and are integrated into the stages of adoption. The ability to sense, seize, and transform will be crucial for the success of the adoption process and will be the guiding principles for the design of SAIL.
- Resource-Based View (RBV) → AI as strategic assets: The principles of RBV are guiding the design of SAIL to ensure that the internal digital products which the new AI initiatives will create need to be aligned with the principles of VRIN in order to provide a sustained competitive advantage.

Each of these theories is a unique piece of the puzzle and when combined together they are able to create a ruleset and outline the scope of the SAIL and give an estimate on the ability of the framework to solve the identified gaps and use cases in the operational context of the organization.

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4.4 Conceptual Evaluation via Use Cases

Extremely crucial part of the DSR methodology is the evaluation of the developed framework. Great idea is only as great as the strongest mechanism which is validating it. The larger and harsher the validation mechanism is, the more credible and valid the idea becomes. By testing the framework against realistic use cases which are not only focused on extreme scenarios, but also on the more common ones, the framework is able to prove its versatility and applicability in a wide range of scenarios. The framework will most likely not be able to solve every single use case which is thrown at it due to extremely large amount of unknown and unpredictable factors which are influencing the adoption process. However, by trying to solve a wide range of use cases, which occur at the companies will give a clear understanding of the strengths and weaknesses of the framework and will provide a solid foundation for future research and development of the framework. The interpretation of the results will be crucial for the success of the framework, as it will provide a clear understanding of the strengths and weaknesses of the framework and will inform future research and development of the framework. The outcomes will need to be interpreted in a structured manner with the ability to reduce

a bias and provide a clear understanding of the strengths and weaknesses of the framework. By having a great suite of testing scenarios, the framework is able to prove its versatility and applicability in a wide range of scenarios. The choice of usecases might be even more crucial than the actual design of the framework, as the use cases will be the ones which will validate the framework and will provide a clear understanding of its strengths and weaknesses. Seeing from which aspect the framework is outperforming and from which aspect it is underperforming will be crucial for the future development of the framework and will provide a solid foundation for future research and development of the framework and its adoption in the real-world scenarios.

5. Framework Development (SAIL)

5.1 Overview of SAIL Framework

- Core design logic.
- Lifecycle perspective.
- Visual diagram.

The Structured AI Lifecycle (SAIL) framework is a nexus between the theoretical foundations of AI adoption and the practical realities faced by software organizations. SAIL is designed to provide a structured approach of company-wide AI adoption, ensuring that business value is maximized while being focused on the operational aspect of the business.
By building on the theoretical foundations outlined in chapter 3 and methodological rigor from chapter 4, SAIL operates in a manner of defining clear design principles and practical steps such as scalability, coordination, value-driven use case prioritization, reuse mechanisms, and governance structures.

SAIL is structured into eight-step lifecycle stages, each addressing a critical phase of AI adoption. The AI adoption journey encompasses stages from early initial opportunity identification to full AI-native integration and optiomization. Each stage is designed to solve a specific set of challenges that organizations typically face during their AI adoption journey. None of these stages exist in isolation; rather, they are interconnected and their combined effect is greater than the sum of their parts. The butterfly effect of each stage is crucial as individual decisions on stage level amplify the overall success of the AI adoption journey.

The north star of SAIL is to ensure that AI initiatives are not only successfully launched but are also scalable, coherent, and reusable across the organization.
Furthermore SAIL will be presented in a visual diagram which will outline the different stages of the framework and their interconnections. The visual representation will provide a clear understanding of the framework and will serve as a reference point for the implementation of the framework in real-world scenarios. The SAIL framework is iterative and flexible, allowing organizations to adapt it to their specific contexts while adhering to the core principles of effective AI adoption and therefore the need to have edge cases and deviations from the outlined path is inevitable.

In the following segments each of the stages of the SAIL framework will be outlined in a structured manner, providing a clear understanding of the framework and its practical application.

5.2 Adoption Stages (Awareness → Pilot → Scale → AI-Native)

- Awareness: building knowledge, initial exploration.
- Pilot: testing in limited scope, measuring outcomes.
- Scale: expanding across units, refining governance.
- AI-Native: embedding AI into strategy, culture, and processes.
- Success factors and risks for each stage.

5.3 Governance and Roles

- Role of CTOs, innovation managers, engineering leads.
- Governance mechanisms: policies, ethics, compliance.
- Decision-making structures.
- Risk and accountability management.

5.4 Use Case Mapping & Prioritization

- Criteria: feasibility, impact, alignment with strategy.
- Prioritization frameworks (e.g., impact-effort matrices).
- Portfolio approach to managing multiple use cases.

5.5 Evaluation and Reuse Mechanisms

- Capturing lessons learned.
- Creating knowledge repositories.
- Facilitating cross-team reuse.
- Feedback loops for continuous improvement.

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6. Use Case Walkthroughs

6.1 Use Case 1

6.2 Use Case 2

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6.3 Use Case 3

- Description of each use case scenario.
- Application of SAIL stages and principles.
- Evaluation against criteria: coherence, scalability, reusability.

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7. Discussion

7.1 Theoretical Contributions

- How SAIL extends existing frameworks.
- Integration of multiple theoretical lenses into one model.

7.2 Practical Implications for Software Organizations

- Playbook for CTOs and managers.
- Guidelines for avoiding fragmented AI adoption.

7.3 Comparison with Existing Models

- Side-by-side strengths and weaknesses.
- Unique value of SAIL (lifecycle + coordination + reuse).

7.4 Challenges and Limitations

- Conceptual boundaries.
- Risks of overgeneralization.
- Directions for empirical follow-up.

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8. Conclusion & Future Work

8.1 Summary of Findings

- Restate research question and main outcomes.

8.2 Contributions to Theory and Practice

- Academic relevance.
- Practical usability for organizations.

8.3 Future Research Directions

- Empirical testing of SAIL.
- Expansion to other industries beyond software.

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8.4 Final Reflection

- Broader perspective on AI adoption journey.
- Closing thought on the role of frameworks in Digital Transformation.

References

[Use [REF] placeholders during drafting; insert proper citations later.]

Appendices

- Extended diagrams of SAIL.

- Comparison tables of frameworks.
- Additional case walkthrough details.