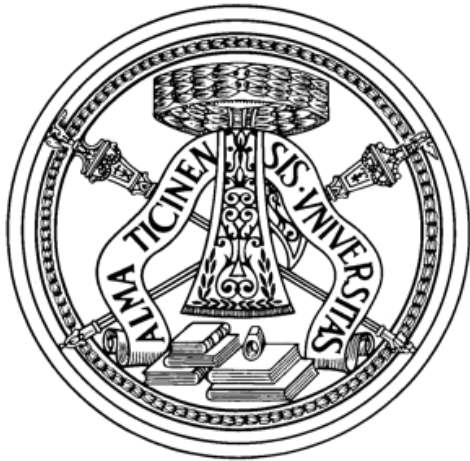


University of Pavia - University of Bergamo

Executive Doctor of Philosophy



An “ACTIVE CHANGE” framework for Scaled Agile transformation in large enterprises

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*To my family,
to my "wife" Lisa and my son Giorgio, an endless source of inspiration, love, and strength.
Every day, with your support, we turn dreams into reality and challenges into opportunities.
Your presence gives meaning to my journey, and your love makes every achievement possible.
With you, nothing is impossible.*

*Alla mia famiglia,
a mia "moglie" Lisa e a mio figlio Giorgio, fonte inesauribile di ispirazione, amore e forza.
Ogni giorno, con il vostro sostegno, trasformiamo sogni in realtà e ostacoli in opportunità.
La vostra presenza dà senso al mio cammino e il vostro amore rende possibile ogni conquista.
Con voi, nulla è impossibile.*

*"I demolished the bridges behind me, so there was no choice but to move forward"
"Ho demolito i ponti alle mie spalle, così non mi è rimasta altra scelta che andare avanti"
Fridtjof Nansen*

*"Not all storms come to disrupt your life. Some come to clear your path"
"Non tutte le tempeste arrivano per sconvolgere la tua vita. Alcune arrivano per spianarti la strada"
Seneca*

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This journey was anything but linear. It was a rollercoaster of enthusiasm and exhaustion, confidence and doubt. More than once, I wondered whether I had taken on too much. Balancing academic work with professional responsibilities and personal life often felt like trying to fix something essential while everything else kept moving.

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But is this really the end of the journey? Knowing myself, probably not. Curiosity rarely settles. More than an arrival, this feels like another step along a path that continues to evolve, driven by questions, exploration, and the desire to keep learning overtime.

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Abstract

The Agile methodology, originally developed for software development, has seen a significant trend of being scaled up to enterprise-level transformations. This shift aims to harness the benefits of Agile across entire organizations, promoting greater flexibility, faster delivery, and improved customer satisfaction. However, one of the foundational principles of Agile is the maintenance of small, cross-functional teams. This principle presents substantial difficulties when attempting to scale Agile practices to the enterprise level, where the complexity and size of operations can hinder the straightforward application of Agile methodologies.

The objective of this research is to critically evaluate the effectiveness of major Agile frameworks when implemented in large-scale organizations. The research is structured in multiple stages to ensure a comprehensive analysis. The initial stage involves conducting a systematic literature review. This review aims to identify and classify the primary challenges and success factors encountered during a Scaled Agile transformation. By meticulously analyzing existing literature, this study seeks to build a solid theoretical foundation that highlights the common obstacles and key elements that contribute to successful Agile transformations in large enterprises.

Following the literature review, the second stage of the research involves executing a detailed survey. This survey is designed to gather empirical data from professionals and organizations that have undergone Agile transformations. The survey aims to assess the impact and outcomes of these transformations, providing a practical perspective on the theoretical findings from the literature review. It also seeks to evaluate the actual relevance and applicability of the identified challenges and success factors in real-world scenarios. The combination of theoretical and empirical insights aims to offer a well-rounded understanding of the dynamics involved in scaling Agile practices.

The third stage of the research focuses on an in-depth case study analysis. This case study examines a specific instance of a Scaled Agile transformation within an international telecommunications operator. The focus is on the creation of digital B2B services, such as Cloud and IoT solutions. This case study provides a detailed exploration of how Agile principles and frameworks are adapted and implemented in a large, complex organization. It highlights the practical challenges and successes experienced during the transformation process, offering valuable lessons and insights for other large enterprises considering similar initiatives.

The final phase of the research consolidates the findings from the systematic literature review, the survey, and the case study analysis. This phase aims to synthesize the results into a coherent and actionable framework that can guide large organizations in their Agile transformation journeys. The goal is to define a structured approach that addresses the unique challenges of scaling Agile practices in large enterprises, providing practical recommendations and strategies to facilitate successful Agile transformations. By integrating theoretical knowledge with empirical evidence and real-world case study insights, this research aspires to contribute significantly to the body of knowledge on enterprise Agile transformations and offer practical solutions to enhance their effectiveness.

Sintesi della ricerca

La metodologia Agile, inizialmente sviluppata per lo sviluppo software, ha visto una crescente tendenza alla sua estensione a trasformazioni su scala aziendale. Questo cambiamento mira a sfruttare i benefici dell'Agile in tutta l'organizzazione, promuovendo maggiore flessibilità, tempi di delivery più rapidi e una migliore soddisfazione del cliente. Tuttavia, uno dei principi fondamentali dell'Agile è il mantenimento di team piccoli e cross-funzionali, principio che comporta notevoli difficoltà nel tentativo di scalare le pratiche Agile a livello enterprise, dove la complessità e le dimensioni operative ostacolano l'applicazione lineare dei modelli Agile.

L'obiettivo di questa ricerca è valutare criticamente l'efficacia dei principali framework Agile quando implementati in organizzazioni di grandi dimensioni. La ricerca è articolata in più fasi per garantire un'analisi completa. La fase iniziale prevede una revisione sistematica della letteratura con l'obiettivo di identificare e classificare le principali sfide e i fattori di successo riscontrati durante una trasformazione Agile scalata. Attraverso un'analisi accurata della letteratura esistente, lo studio intende costruire una solida base teorica che metta in luce gli ostacoli comuni e gli elementi chiave che contribuiscono al successo delle trasformazioni Agile nei grandi contesti aziendali.

Successivamente, la seconda fase della ricerca prevede l'esecuzione di un'indagine dettagliata. Il sondaggio è progettato per raccogliere dati empirici da professionisti e organizzazioni che hanno intrapreso trasformazioni Agile, al fine di valutarne l'impatto e i risultati. L'obiettivo è fornire una prospettiva pratica rispetto ai risultati teorici emersi dalla letteratura, e verificare la rilevanza e l'applicabilità concreta delle sfide e dei fattori di successo identificati.

La terza fase si concentra su un'analisi approfondita di un caso di studio. Viene esaminata una trasformazione Agile scalata all'interno di un operatore internazionale di telecomunicazioni, con focus sulla creazione di servizi digitali B2B, come soluzioni Cloud e IoT. Il caso offre un'esplorazione dettagliata di come i principi e i framework Agile siano stati adattati e implementati in un'organizzazione ampia e complessa, mettendo in evidenza sfide operative e successi concreti, utili per altre aziende che intendano intraprendere iniziative simili.

La fase finale della ricerca consolida i risultati emersi dalla revisione sistematica della letteratura, dal sondaggio e dall'analisi del caso di studio. L'obiettivo è sintetizzare tali evidenze in un framework coerente e applicabile che possa guidare le grandi organizzazioni nei percorsi di trasformazione Agile. L'intento è definire un approccio strutturato in grado di affrontare le specificità dello scaling Agile in contesti enterprise, offrendo raccomandazioni e strategie pratiche per abilitare trasformazioni efficaci. Integrando conoscenze teoriche, dati empirici e insight da casi reali, questa ricerca ambisce a contribuire significativamente alla letteratura sulla trasformazione Agile a livello enterprise, offrendo soluzioni pratiche per aumentarne l'efficacia.

1 Introduction

In an era marked by accelerated digital transformation, large enterprises find themselves at a crossroads, caught between traditional operational modes and the compelling need to innovate rapidly. Agility serves as the critical fulcrum that balances these divergent demands, enabling organizations to adapt to market fluctuations, capitalize on digital advancements, and meet volatile customer needs effectively [1, 2]. Agile methodologies, initially incubated within the realms of software engineering, have gained traction across diverse organizational functions and industries. Despite the broader adoption, these methodologies primarily targeted small teams and defined projects, leading to questions about their scalability and applicability in large, complex enterprises.

Within the Agile methodology spectrum, several frameworks have been designed to tackle the challenges associated with scaling Agile practices across extensive organizational landscapes [3]. These frameworks aim to harmonize Agile practices across multiple interacting teams, manage dependencies, and align Agile transformation with the strategic imperatives of the organization. Despite their promise, there remains a lacuna in understanding how these frameworks can be customized to serve the unique demands and complexities of digital transformation initiatives within large enterprises.

One key aspect that intensifies the complexity of Scaled Agile transformation is the interplay between the Agile practices and the existing organizational culture. Hierarchical structures, deeply ingrained processes, and traditional role definitions often conflict with the fluid, collaborative nature of Agile frameworks. This culture-practice dissonance not only affects the efficiency of Agile practices but also poses significant managerial challenges that extend beyond the scope of project management into governance and strategy [4].

Moreover, the geographic dispersion of teams in global organizations adds another layer of complexity, affecting coordination, communication, and control in Agile settings. How can large enterprises create a unified Agile culture in a landscape punctuated by geographical, cultural, and functional silos?

Additionally, the role of technology in facilitating or impeding the Scaled Agile transformation is nontrivial. The harmonization of Agile practices often necessitates a complementary ecosystem of digital tools and platforms that can provide real-time insights, foster collaboration, and enable effective decision-making. The technology aspect, therefore, goes beyond being a mere enabler and becoming an active agent in the Agile transformation process.

1.1 Agile overview

Agile methodologies emerged in the late 20th century as a response to the inadequacies of traditional project management approaches in the rapidly evolving field of software development. The historical roots of Agile can be traced back to the 1990s when software projects frequently encountered delays, budget overruns, and failure to meet user requirements. To address these issues, industry experts sought more flexible and adaptive approaches.

The formalization of Agile methodologies occurred in 2001 with the creation of the Agile Manifesto. Seventeen software developers, frustrated with the limitations of the traditional Waterfall model, convened at a ski resort in Utah to outline a new approach to software development. The result was the Agile Manifesto, which articulated four core values and twelve guiding principles aimed at improving the development process by emphasizing flexibility, collaboration, and customer satisfaction.

1.1.1 Agile values

The values form the cornerstone of Agile methodologies, prioritizing human interactions, adaptive planning, and delivering real, usable software. They establish a foundational philosophy that guides Agile practices, ensuring a flexible and customer-centric approach to software development.

- **Individuals and interactions over processes and tools:** This value highlights the importance of the people involved in the development process and their interactions. Agile prioritizes the effectiveness of communication and collaboration among team members over the rigid adherence to processes or reliance on tools.
- **Working software over comprehensive documentation:** The primary measure of success in Agile is the delivery of working software, rather than the production of extensive documentation. While documentation has its place, it should not impede the delivery of functional software.
- **Customer collaboration over contract negotiation:** Agile emphasizes ongoing collaboration with customers to ensure their needs are understood and met. Rather than focusing solely on the terms of a contract, Agile teams engage customers throughout the development process to adapt to their changing requirements.
- **Responding to change over following a plan:** Agile recognizes that change is inevitable and often beneficial. Instead of strictly adhering to a predefined plan, Agile teams remain flexible and responsive to new information, requirements, and market conditions.

1.1.2 Agile principles

The principles embody the core tenets of Agile methodologies, focusing on adaptability, teamwork, and delivering value to the customer. They serve as the fundamental guidelines that drive Agile practices, ensuring a responsive and collaborative approach to software development.

1. **Customer satisfaction through early and continuous delivery:** The highest priority in Agile methodologies is to satisfy the customer by delivering valuable software early and continuously. This approach ensures that the customer sees tangible progress and can provide feedback that guides further development.
2. **Welcoming changing requirements:** Agile processes are designed to accommodate changing requirements, even late in development. This flexibility allows teams to adapt to new information and shifting market conditions, providing a competitive advantage to the customer.

3. **Frequent delivery of working software:** Agile encourages the delivery of working software frequently, ranging from every couple of weeks to a few months. The preference is for shorter timescales to maintain momentum and allow for regular feedback and improvements.
4. **Daily collaboration between business and development teams:** Effective Agile projects require continuous collaboration between business stakeholders and developers. Daily interactions ensure alignment on goals, immediate resolution of issues, and a shared understanding of project progress.
5. **Building projects around motivated individuals:** Agile methodologies emphasize the importance of motivated individuals. Teams are provided with the necessary environment and support and are trusted to complete their work efficiently. This empowerment leads to higher morale and productivity.
6. **Face-to-Face communication:** The most effective method of conveying information within a development team is through face-to-face conversations. This principle underscores the value of direct communication to avoid misunderstandings and enhance team cohesion.
7. **Working software as a measure of progress:** In Agile, the primary measure of progress is working software. Unlike traditional metrics that focus on documentation or milestones, Agile prioritizes the actual product and its functionality as indicators of success.
8. **Sustainable development pace:** Agile promotes sustainable development practices where sponsors, developers, and users can maintain a constant work pace indefinitely. This prevents burnout and ensures steady progress over time.
9. **Continuous attention to technical excellence and good design:** Agile teams continuously focus on technical excellence and good design, which enhances their ability to be Agile. High-quality code and thoughtful design practices facilitate easier modifications and faster response to change.
10. **Simplicity:** Simplicity, defined as the art of maximizing the amount of work not done, is essential in Agile. By focusing on the essential tasks and eliminating unnecessary work, teams can streamline processes and increase efficiency.
11. **Self-organizing teams:** The best architectures, requirements, and designs emerge from self-organizing teams. Agile empowers teams to take ownership of their work, make decisions, and innovate, leading to more effective and creative solutions.
12. **Regular reflection and adjustment:** At regular intervals, Agile teams reflect on their effectiveness and adjust their behaviors accordingly. This continuous improvement cycle ensures that the team evolves and adapts to new challenges and opportunities.

1.1.3 Differences between waterfall and Agile methodologies

The Waterfall and Agile models represent distinct methodologies in project management, each with unique characteristics and approaches. These methodologies have evolved from different historical contexts and address the needs of project management in diverse ways (Figure 1).

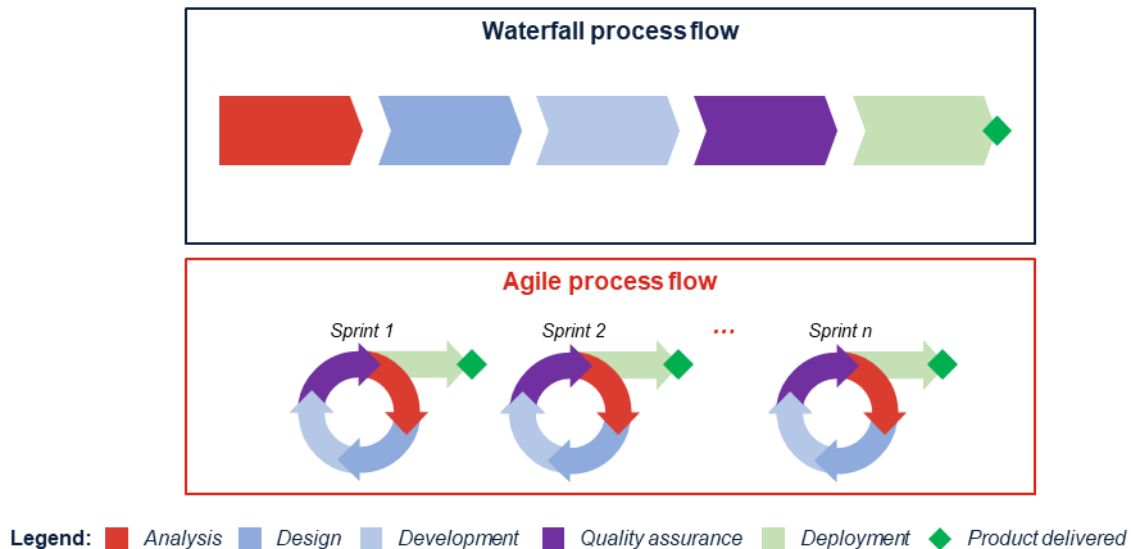


Figure 1 - Waterfall and Agile process flow

Waterfall model

This model involves distinct phases such as analysis, design, development, testing, and deployment, which must be completed in order before moving to the next phase. Each phase has specific deliverables and a review process, ensuring thorough documentation and minimal overlap between stages. Requirements are typically gathered and finalized at the project's inception, and the project's success hinges on the accuracy and completeness of this initial planning phase. Changes during the project lifecycle are often discouraged or difficult to incorporate, making this model suitable for projects with stable, well-defined requirements.

Waterfall's strength lies in its structured approach, which can provide clarity and predictability, especially in large-scale projects with fixed requirements. Its linear nature simplifies project tracking and management, allowing for detailed project schedules and milestones. However, this rigidity can also be a drawback, as it may not accommodate changes easily, leading to potential issues if initial requirements are not accurately captured or if external conditions evolve.

Agile model

Agile methodologies, in contrast, emphasize iterative development, where projects are broken down into small, manageable units called iterations or sprints. Each iteration involves a complete cycle of planning, design, development, testing, and review, producing a functional product increment at the end. This approach allows teams to gather feedback continuously and incorporate changes throughout the project lifecycle. Agile methodologies encourage collaboration and communication among cross-functional teams, stakeholders, and customers, fostering a more dynamic and responsive development process.

The Agile model's flexibility makes it well-suited for projects with dynamic requirements and those needing rapid adaptation to changing conditions. By delivering functional increments regularly, Agile teams can provide early value to customers and stakeholders, ensuring that the product aligns with user needs and expectations. This iterative approach also promotes continuous improvement, as teams reflect on their processes and outcomes after each iteration and make necessary adjustments for subsequent cycles.

Key differences:

- **Flexibility:** Waterfall is rigid and linear, requiring a clear path from start to finish. Agile is flexible and iterative, accommodating changes and evolving requirements throughout the project.
- **Requirements:** In Waterfall, requirements are defined and fixed upfront. Agile allows for evolving requirements, adapting to new insights and feedback as the project progresses.
- **Documentation:** Waterfall emphasizes comprehensive documentation at each phase to ensure clarity and completeness. Agile focuses on minimal, relevant documentation, prioritizing working software and customer collaboration.
- **Team structure:** Waterfall follows a top-down hierarchy with distinct roles and responsibilities for each phase. Agile promotes cross-functional, self-organizing teams that work collaboratively across all project stages.
- **Delivery:** Waterfall delivers a final product at the end of the project lifecycle. Agile delivers functional increments regularly, providing early and continuous value to customers.
- **Change management:** Waterfall has limited ability to handle changes once the project starts, as changes can disrupt the linear progression. Agile is designed to embrace and adapt to change, allowing for frequent reassessment and course corrections.

1.1.4 Scaled Agile operating model

Scaling Agile within an organization fundamentally transforms its structure and operations. Traditional, hierarchical organizations operate like "machines," characterized by rigid processes and clear, siloed divisions of labor. In contrast, an Agile organization functions more like an "organism," marked by interconnections and collaboration across departments (Figure 2).

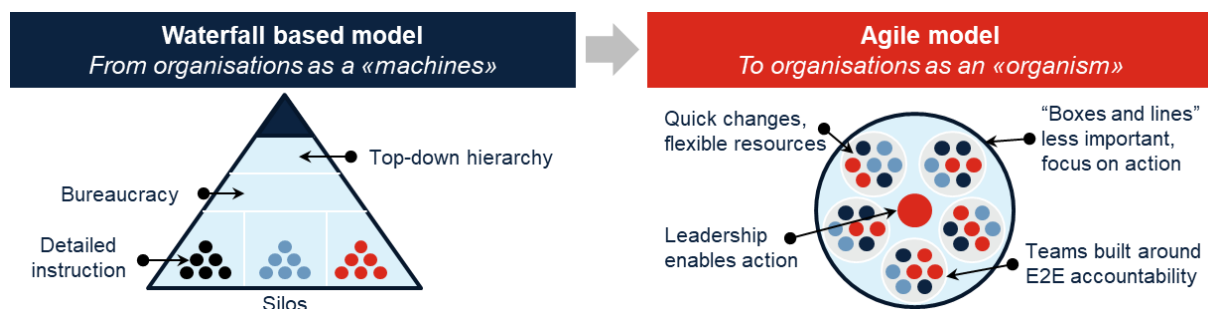


Figure 2 - Differences between waterfall and Agile operating model

- **Traditional Waterfall model – Organization as a "machine"**: In this model, decision-making is centralized, with instructions flowing downward in a top-down hierarchy. The Waterfall model relies heavily on extensive documentation and formal approval processes, resulting in bureaucratic inertia. Departments function in silos, operating independently with minimal cross-functional interaction. Instructions are detailed and unchanging, set at the start of the project.
- **Agile model – Organization as an "organism"**: Conversely, an Agile organization is built around interconnected teams that work collaboratively across departments. Resources and team compositions are flexible, adjusted as needed to respond to changing requirements. Leadership in an Agile organization provides vision and direction but empowers teams to make their own decisions. Teams take end-to-end accountability for the entire lifecycle of a project, from conception to deployment.

This transformation enhances collaboration through increased communication and cooperation among teams, leading to more innovative solutions. The organization becomes more adaptable, capable of quickly responding to changes in the market or customer needs. Continuous improvement is achieved through regular reflection and feedback loops, ensuring ongoing enhancements in processes and outcomes.

1.2 Research questions and scope

This research advances the academic debate by addressing two gaps that remain only partially explored in the existing literature. First, studies on Scaled Agile transformation have not yet produced a unified process oriented perspective capable of capturing the sequential interactions between challenges, coping mechanisms and organizational responses in large enterprise settings. Second, empirical evidence is still limited regarding the specific organizational domains that undergo the most significant transformation when Agile practices are scaled. Prior research has predominantly examined individual frameworks, isolated categories of success factors or single sector case studies, resulting in a fragmented and often non comparable body of knowledge. This thesis addresses these limitations by providing a consolidated process based interpretation of how large enterprises navigate Agile scaling, by reducing the fragmentation of existing findings through a cross domain analysis of success factors and challenges, and by identifying with greater analytical precision the domains in which transformation pressures concentrate. In doing so, the study clarifies how Scaled Agile adoption unfolds across both process dynamics and organizational structures, thereby extending the theoretical foundations of enterprise level agility.

This research endeavors to delve deep into these aspects, examining the Scaled Agile transformation in large enterprises with a particular focus on digital transformation. For the accomplishment of this study's objectives, the focus is directed toward examining large-scale Agile transformation using a process-oriented perspective. This approach captures the dynamics between challenges faced, coping mechanisms employed, and actions taken for scaling Agile methods.

The inquiry is structured around two research questions, aimed at delineating a series of best practices for successfully implementing a Scaled Agile transformation:

RQ1: What key success factors and challenges are influential in implementing large-scale Agile transformation within a large enterprise environment?

This question is academically relevant because existing literature provides fragmented and sector specific evidence on why Agile scaling succeeds or fails in complex organizations. By isolating success factors and barriers across a broad sample, the research aims to clarify which conditions consistently enable or hinder large scale Agile adoption. The goal is to advance theoretical understanding of the determinants of Agile scalability in enterprise contexts.

RQ2: Which are the most impacted domains during the implementation of a large-scale Agile transformation within a large enterprise environment?

This question is important because scholarly work has not yet reached consensus on which organizational domains absorb the highest level of change when Agile is scaled. Understanding where the impact concentrates allows researchers to refine theories of organizational adaptation and to identify the domains that drive or constrain enterprise level agility. The aim is to demonstrate how transformation pressure distributes across functions and why certain areas become critical leverage points in Scaled Agile initiatives.

Together, these research questions seek to contribute to academic discourse by explaining not only what enables successful scaling but also where transformation efforts generate the most structural, cultural and operational change within large enterprises.

1.3 Research methodology

This research is based on a structured approach designed to ensure scientific rigor and value. The methodology is divided into three main phases: Thesis, Theory, and Prototype, each serving a distinct purpose in addressing the research objectives (Figure 3).

- **Thesis phase:** The first step in the research process is the Thesis phase, which focuses on defining the research questions. This phase is crucial as it sets the scope and focus of the entire research. The research questions are formulated to identify the key aspects of Agile adoption in large enterprises and the factors influencing successful Agile transformations. By clearly defining these questions, the research aims to guide the subsequent phases towards addressing specific, relevant issues in the context of Scaled Agile methodologies.
- **Theory phase:** The second step is the Theory phase, which involves a thorough analysis of the current state of academic research through a systematic literature review. This review aims to gather comprehensive insights into existing knowledge, theories, and practices related to Agile methodologies and their application in large enterprises. By systematically reviewing relevant literature, the research identifies gaps, challenges, and success factors associated with Agile adoption.

Using the information obtained from the systematic literature review, the research proceeds to build an online survey. This survey is designed to evaluate the actual adoption of Agile practices in large enterprises, focusing on their experiences, challenges, and outcomes. The survey data provides empirical evidence to complement the theoretical insights from the literature review.

Additionally, this phase includes the analysis of a structured case study involving a global telecommunications operator that widely uses Agile methodologies to define B2B digital services. The case study provides practical insights into the application of Agile in a real-world, large-scale context, highlighting both challenges and success factors.

- **Prototype phase:** Based on the challenges and success factors identified during the Theory phase, the third phase, known as the Prototype phase, aims to define a modular framework. This framework is intended to simplify the adoption of Scaled Agile transformations in large enterprises. The modular nature of the framework ensures its adaptability and scalability, making it suitable for various organizational contexts and needs.

The framework is designed to address specific challenges identified in the literature review and case study analysis, providing practical solutions and guidelines for successful Agile transformation. While this phase concludes with the development of the framework, the next step, not covered in this thesis, involves testing the framework in a large corporate setting to evaluate its effectiveness and practical applicability.

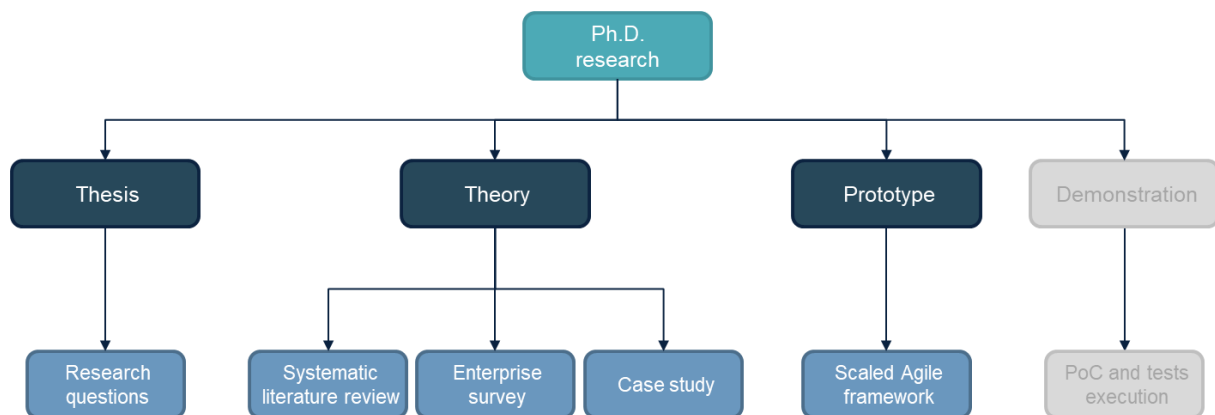


Figure 3 - Research methodology

1.4 Thesis structure

The methodology of this research is meticulously reflected in the index of chapters, providing a clear guide for the reader through the various steps of the study. The thesis encompasses a range of academic and business-oriented perspectives to ensure a comprehensive and structured analysis. The following outline presents the detailed structure of the thesis:

- **Chapter 1 - Introduction to Agile and Scaled Agile concepts:** The first chapter introduces the fundamental concepts of Agile and Scaled Agile methodologies. It defines the research questions that guide the study and outlines the research methodology used to address these

questions. This chapter sets the stage for the entire research by establishing the context and objectives.

- **Chapter 2 - Systematic literature review:** Chapter 2 presents a systematic literature review to assess the status of academic research on Agile methodologies. This review aims to extract key insights and identify gaps in the existing body of knowledge. By analyzing a wide range of sources, the chapter provides a solid theoretical foundation for the research.
- **Chapter 3 - Online survey analysis:** In Chapter 3, the research analyzes data collected through an online survey conducted between May 2024 and August 2024. This survey gathers diverse viewpoints from companies in the process of adopting a Scaled Agile approach or those already using a Scaled Agile model. The analysis offers empirical evidence on the challenges and success factors experienced by these companies.
- **Chapter 4 - Case study analysis:** Chapter 4 delves into a structured case study of a global telecommunications operator that has implemented Agile strategies in multiple waves. This case study examines how the company tailored its Agile transformation to meet evolving digital needs, providing practical insights into the application of Agile methodologies in a large-scale context.
- **Chapter 5 - Definition of a modular Scaled Agile framework:** Based on the insights gained from the literature review, survey analysis, and case study, Chapter 5 defines a modular Scaled Agile framework. This framework addresses the challenges and success factors identified in the previous chapters and provides a structured approach to facilitate a smooth transition to Scaled Agile for large enterprises.
- **Chapter 6 - Summary and future roadmap:** The final chapter summarizes the findings and results of the entire research. It synthesizes the key insights from each chapter and outlines the roadmap for future evolution and application of the modular Scaled Agile framework. This chapter concludes the thesis by highlighting the contributions of the research and proposing directions for further study.

This structured approach ensures that the reader can easily follow the progression of the research, from the introduction of concepts to the development of practical frameworks and conclusions. Each chapter builds upon the previous one, creating a cohesive narrative that integrates academic research with real-world application.

2 Systematic Literature Review

This chapter outlines the strategy adopted for the systematic literature review and defines the specific objectives guiding the analysis. Its primary aim is to consolidate existing academic knowledge on Scaled Agile transformation, identify recurrent success factors and challenges, and highlight unresolved theoretical gaps that justify the subsequent empirical investigation. The expected outcome is a structured synthesis of the state of the art that clarifies what is already known, what remains inconsistent, and which areas require further inquiry to support the development of the research framework.

The strategy for the systematic literature review is described in detail, presenting the steps followed to ensure methodological rigor and analytical robustness. This study updates and extends previous literature reviews by integrating more recent contributions and by adopting a process oriented classification that enables a clearer interpretation of how large enterprises approach the scaling of Agile practices [5].

2.1 Research scope

The term “large-scale” in the context of Agile transformation is multifaceted, often interpreted through a variety of metrics such as the number of individuals or teams involved, financial investment, complexity of the project, and duration. Instances characterized as “large-scale” are quite diverse, from those incorporating 40 individuals and seven teams to settings with over 50 team members [6].

Other studies classify Agile transformations with up to 50 participants as “small-scale”, while tagging those involving 50 to 100 people, covering all occupational roles, as “large-scale” [7]. The most expansive configurations include up to 300 individuals situated at multiple sites [8].

For the purpose of this study, “large-scale” is defined as Agile transformations involving a minimum of 50 individuals or at least 6 collaborating teams. This definition extends to various roles beyond traditional ones and is relevant to organizations singularly focused on Scaled Agile transformation as well as specialized divisions within broader, diversified entities. Additionally, it is worth noting that the complexity and difficulty of Agile adoption tends to increase proportionally with the size of the organization, a challenge that necessitates a more tailored approach to implementation.

2.2 Searching strategy

Upon identification of the research questions, we established a series of relevant keywords to guide the scholarly inquiry. These selected keywords encompass:

- Scaled Agile transformation
- Large-scale Agile transformation
- Enterprise Agile frameworks
- Agile transformation in large organizations
- Organizational change and Agile
- Agile governance in large enterprises

- Challenges in Scaled Agile transformation
- Benefits of Scaled Agile transformation
- Case studies on enterprise Agile transformation

Subsequently, we utilized these keywords to execute a systematic search across highly reputable academic repositories, including:

- Scopus
- Web of Science
- IEEE
- ScienceDirect
- ACM Digital Library

2.3 Selection strategy

The research is anchored in a robust two-step approach, concentrating on the intricacies of Scaled Agile transformation within large corporations. In the initial phase, a systematic literature review is undertaken, diligently pinpointing the primary challenges and success factors associated with such transformations. After this foundation, the research delves into the second phase, emphasizing the mapping of these identified challenges and success factors. This detailed mapping is aimed at discerning which success factors have the potential to address one or multiple challenges directly (Figure 4). In addition to this, the study also undertakes an analysis of the domains most impacted by these challenges, utilizing the socio-technical framework as a lens.

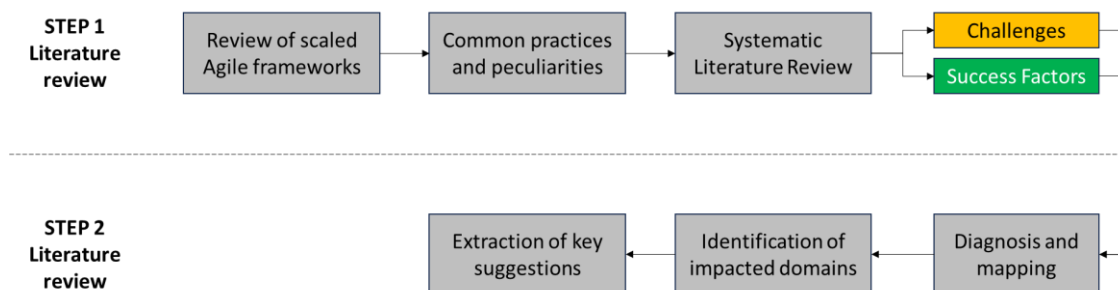


Figure 4 - Research process

In the execution of the literature review, a three-tiered selection strategy is employed to sift through potential research papers. Initially, a preliminary screening is conducted where articles are eliminated based on a set of predefined criteria, including relevance of the title, language limitations, empirical nature and journal or conference ranking (Table 1). Specifically, papers with irrelevant titles, non-English content, non-empirical research methods, or publications in low-ranked journals or conferences are systematically removed.

Inclusion criteria	Exclusion criteria
<ul style="list-style-type: none"> • Publications dated from 2008 to the present, with the starting point being the year the first Scaled Agile framework, LeSS, was introduced • Peer-reviewed articles from conferences and journals focusing on the realms of computer science and management • Articles ought to detail Scaled Agile adoption and transformation in Large Enterprises 	<ul style="list-style-type: none"> • Works like books, white papers, posters, and non-peer-reviewed articles in general • Papers that appear more than once across online libraries • Non-English content or non-empirical research methods • Conference or journal ranking below the B grade • Research focused only on the technical side of the Scaled Agile implementation

Table 1 - Inclusion and exclusion criteria

Following this, a short reading phase ensues, wherein articles are subjected to further scrutiny based on their abstracts and research questions. At this stage, only papers in which at least one of the selected keywords appears in the title or in the abstract are retained, as this criterion was adopted to ensure that the relevance of each contribution is grounded in the core focus of the study rather than in peripheral mentions. Papers that do not align well with the targeted focus are excluded. Finally, a full reading of the remaining articles is undertaken to determine their applicability to the subject matter of Scaled Agile transformation. Any paper that either lacks a focus on Scaled Agile transformation or is strictly centered on software development is excluded from the final set of literature to be reviewed.

After employing this three-tiered selection strategy, 51 papers were identified that align perfectly with the research purpose. These papers will undergo a detailed analysis to further understand Scaled Agile transformation in large enterprises (

Search for papers	Searched in Scopus, Web of Science, IEEE, ScienceDirect, ACM Digital Library	2237
Preliminary screening	Excluded irrelevant papers, duplicates, non-English, non empirical research papers (based on title, abstract and conclusions)	891
Quality assessment	Excluded papers not matching the inclusion criteria	51

Figure 5).

Search for papers	Searched in Scopus, Web of Science, IEEE, ScienceDirect, ACM Digital Library	2237
Preliminary screening	Excluded irrelevant papers, duplicates, non-English, non empirical research papers (based on title, abstract and conclusions)	891
Quality assessment	Excluded papers not matching the inclusion criteria	51

Figure 5 - Filtering process

2.4 Classification strategy

The distribution of the selected publications on Scaled Agile transformation in large organizations reveals a discernible trend, culminating in a significant peak in 2019 (Figure 6).

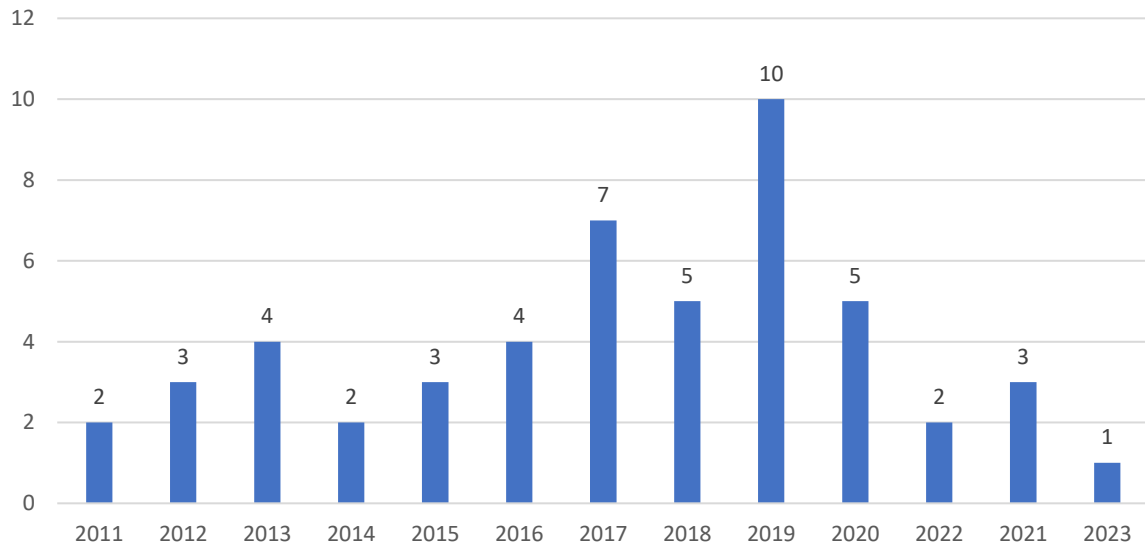


Figure 6 - Distribution of publications over the years

This peak is particularly significant as it aligns with a period when numerous companies reported encountering challenges with the implementation of Scaled Agile frameworks. These challenges were not merely operational but also strategic, as organizations grappled with integrating Scaled Agile methodologies at a broader, organizational level. In some cases, these difficulties were profound enough to prompt companies to reconsider or even retract their initial adoption of these frameworks. The years surrounding 2019, specifically from 2017 to 2020, also show an increased academic interest in this field, reflecting the growing relevance of Scaled Agile transformation in large organizations and the complexities associated with its implementation.

The distribution of papers on Scaled Agile transformation shows a marked concentration in Europe, particularly in Germany and the Nordic countries. With a total of 38 publications, Europe significantly surpasses other continents, highlighting a strong interest and engagement in Scaled Agile methodologies within this region. The combined contributions from Germany, Finland, Norway, Sweden, and the United Kingdom form a substantial part of Europe's total output in this field (Figure 7).

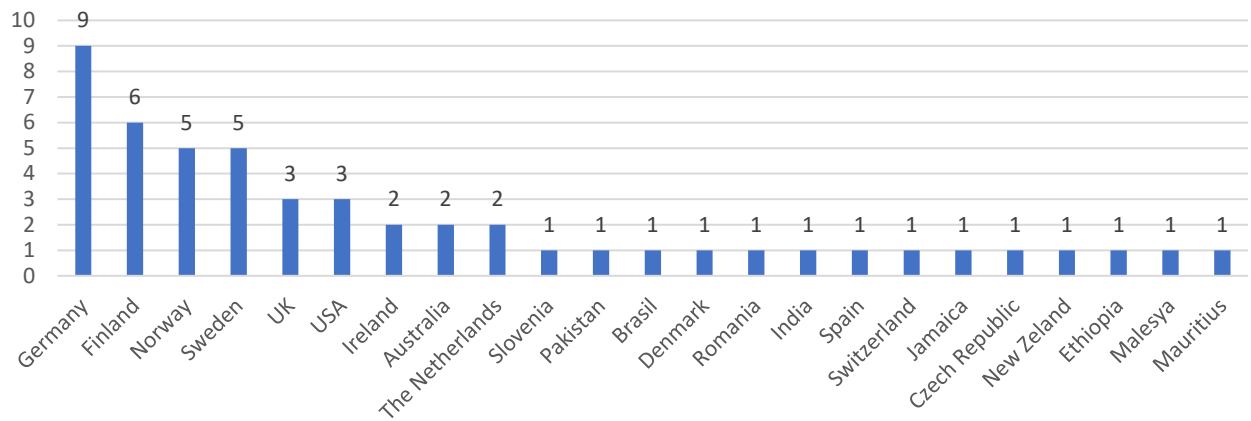


Figure 7 - Distribution of publications across countries

Germany is notable for its strong industrial base and established technological sector, environments that are conducive to both adopting and academically exploring Scaled Agile frameworks. Similarly, the Nordic countries demonstrate a significant engagement with Agile methodologies. This trend in the Nordics can be attributed to their progressive technological landscapes, innovative business cultures, and a propensity for organizational flexibility and innovation, all of which are essential for the successful implementation of Scaled Agile frameworks.

The analysis of the research approach used in the selected papers reveals a predominant interest in case studies. This trend indicates a shift towards a more concrete analysis of the benefits and challenges of implementing Scaled Agile frameworks in large enterprises. Case studies provide in-depth insights into real-world applications, offering a practical perspective on the complexities and outcomes of these transformations (Figure 8).

Framework comparisons are also widely utilized to delineate the pros and cons of various Scaled Agile frameworks, aiding organizations in identifying the most suitable framework based on industry specifics or areas of application. Such comparisons are crucial for decision-makers seeking to understand which frameworks align best with their organizational needs and goals. Similarly, conceptual analyses focus on the development of customized versions of mainstream Scaled Agile frameworks. This approach addresses the limitations inherent in existing frameworks, proposing modifications or adaptations to better suit specific organizational contexts. The interest in conceptual analyses reflects an ongoing effort to refine and evolve Scaled Agile methodologies, ensuring they remain relevant and effective in diverse business environments.

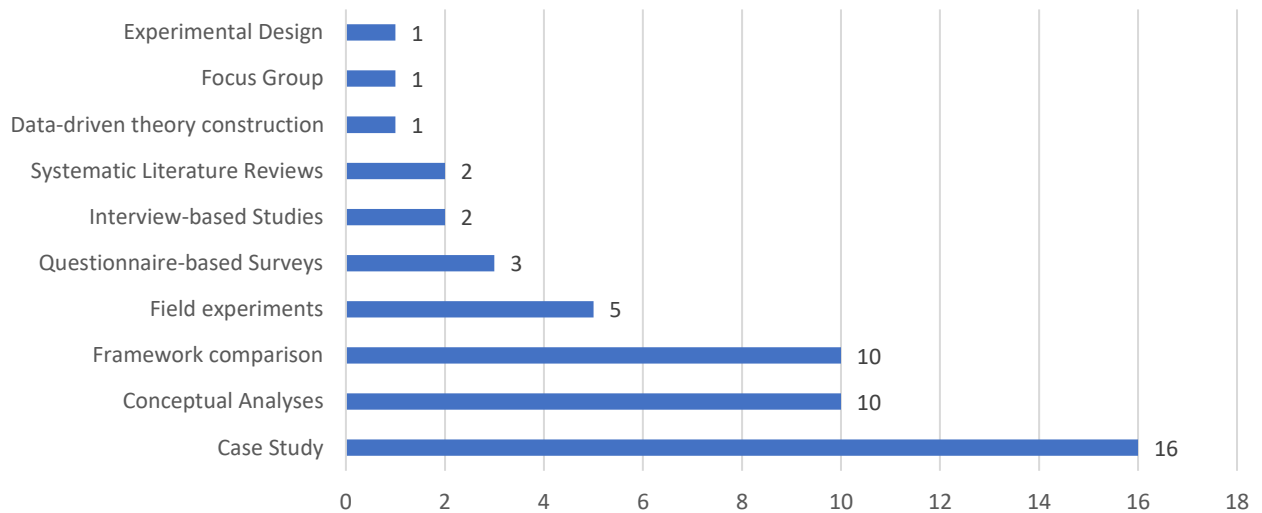


Figure 8 - Distribution of Publications by Research Approach

2.5 Keyword co-occurrence analysis

To identify the latent thematic structures that characterize international research on large scale Agile transformation, the study performs a systematic keyword co-occurrence analysis supported by Orange3 Text Mining [9], an open source cognitive computing environment designed for advanced corpus exploration. This tool enables the construction of analytical pipelines that combine linguistic preprocessing, token frequency inspection, vector based representations and similarity based clustering. Its modular design makes it suitable for detecting how specific concepts tend to appear together across heterogeneous academic contributions, thereby providing a structured view of the conceptual architecture emerging from the literature.

The selection of the concepts included in the co-occurrence table followed a rigorous multistage procedure. Initially, titles, abstracts and author provided keywords from all documents in the corpus were processed to extract the full set of unique terms associated with Agile scaling, organizational change and socio technical dynamics. This raw list of terms was then filtered through substantive criteria to retain only the constructs meeting at least one of the following conditions:

- terms appearing across a meaningful subset of documents, ensuring that the concept represents a stable topic rather than an isolated formulation
- terms occurring in papers belonging to multiple research traditions, including case studies, empirical evaluations, surveys and conceptual analyses, thus demonstrating transversal relevance
- terms recognized as established constructs within the discourse on Agile at scale, as evidenced by recurrent usage across several authors and publication years

This filtering strategy ensures that the table represents recurring scholarly concerns rather than sporadic terminology introduced in individual studies.

The classification of co-occurrence intensity from Low to Very high was derived through a mixed approach that integrates computational signals generated by Orange3 Text Mining with a qualitative validation step. Three quantitative indicators informed the assessment:

- the frequency with which two concepts appear together within the same document
- the diffusion of the pair across the corpus, measured as the number of papers in which the two concepts co appear
- the semantic proximity of the pair, estimated through vector space similarity scores produced by the tool

To reinforce the validity of the analysis, these quantitative indicators were complemented by a targeted reading of representative papers to verify that high similarity scores corresponded to a substantive conceptual relationship rather than to lexical coincidence. This interpretative layer safeguards the analysis from misleading associations that may arise in automated text processing.

The final intensity scale reflects the integration of computational evidence with scholarly judgement.

1. **Low** indicates minimal co-occurrence, suggesting limited conceptual association within the literature
2. **Medium** denotes recurring yet non dominant connections between concepts
3. **High** corresponds to strong thematic relationships that appear consistently across research contexts, methodologies and publication years
4. **Very high** is reserved for concept pairs that exhibit pervasive co-occurrence, high semantic similarity and broad diffusion across the corpus, marking them as structural pillars of the current academic debate on Agile transformation at scale

2.5.1 Interpretation of co-occurrence results

The co-occurrence matrix constructed on the reduced set of conceptual categories reveals a clear and compact thematic structure that mirrors the dominant lines of inquiry in the international literature on large scale Agile transformation. Despite the streamlined configuration, the relationships captured remain strong and coherent, reinforcing the idea that research in this field gravitates around a few tightly interdependent constructs (Table 2).

	Agile transformation	Scaled Agile framework	Multi-team coordination	People and culture	Team autonomy
Agile transformation	—	High	High	Very high	Medium
Scaled Agile framework	High	—	Very high	Medium	Very high
Multi-team coordination	High	Very high	—	Medium	Very high
People and culture	Very high	Medium	Medium	—	Medium
Team autonomy	Medium	Very high	Very high	Medium	—

Table 2 - Heatmap of keyword co-occurrence intensities

The strongest cluster links Agile transformation with the People and culture dimension, which displays the highest level of association. This pattern shows that scholars consistently interpret transformation at scale as a socio cultural process rather than as a purely methodological shift. Cultural alignment shared behavioral norms and communication practices are repeatedly positioned as foundational drivers in the success or failure of enterprise level Agile initiatives.

A second cluster emerges from the very high co-occurrence among scaled Agile frameworks, multi-team coordination and team autonomy. These three constructs form a structural core in the literature. The strong association between frameworks and coordination reflects the recurrent emphasis on dependency management, synchronization mechanisms and cross team collaboration. The equally strong link with autonomy highlights that empowerment is viewed as both an enabler and a tension point within large scale contexts. Autonomy appears as an attribute that must be balanced with system level coherence provided by frameworks and coordination routines.

People and culture maintains medium intensity links with coordination and autonomy, signaling that behavioral and cultural aspects underpin not only transformation as a whole but also the dynamics that arise when teams interact at scale. These connections indicate that coordination effectiveness and autonomy management both depend on shared values, communication norms and psychological readiness for distributed decision making.

Overall, the results point to a conceptual landscape organized around three reinforcing axes: socio cultural adaptation, structural mechanisms for coordination and autonomy design. These axes define the core vocabulary with which the academic community interprets the challenges and enablers of Agile transformation in large enterprises, and they provide a clear theoretical space within which the thesis positions its contribution.

2.6 Results and discussion

The results and discussion of the systematic literature review detail the key findings and their implications. This section synthesizes the insights gained from the reviewed studies, comparing them to provide a comprehensive understanding of the current state of Agile methodologies.

2.6.1 Scaled Agile frameworks

In an endeavor to provide a comprehensive view of Agile transformation methodologies, this analysis scrutinizes some of the most widely adopted frameworks that organizations employ to scale Agile practices. The frameworks examined here include Disciplined Agile Delivery (DAD), Large Scale Scrum (LeSS), Nexus, Scaled Agile Framework (SAFe), Scrum at Scale, and the Spotify Model. Each of these frameworks offers distinct features, roles, and scaling capabilities, aimed at addressing the unique challenges of different organizational contexts [10]. The following in-depth assessment delves into the core principles, operational modalities, and distinct advantages of each framework, to offer nuanced insights into their efficacy for Scaled Agile transformations.

Disciplined Agile Delivery (DAD)

Developed in 2011 by Scott Ambler and Mark Lines, DAD aims to supplement Scrum methodologies with additional strategies and practices drawn from other Agile methodologies such as Extreme Programming (XP), Unified Process (UP), and Kanban. DAD encompasses the complete product lifecycle, from ideation to operational support. Structured into three distinct phases, DAD promotes an incremental building of a product. Its roles are categorized into primary roles: team lead, product owner, architecture owner, team member, and stakeholder, which are constant across teams of varying sizes, and secondary roles: specialist, integrator, domain expert, technical expert, and independent tester, which appear in larger teams for specific duration [11].

DAD scales in two dimensions: tactical agility and strategic agility. Tactical agility involves adapting the framework to fit various contexts such as team size, geographical distribution, and project complexity. Strategic agility takes a broader approach by promoting the adoption of lean and Agile strategies across the organization.

LeSS (Large Scale Scrum)

LeSS was designed to extend the capabilities of Scrum for large-scale and multi-location projects. It mandates organizational changes in addition to the traditional Scrum practices, focusing on the formation of cross-functional teams by eliminating traditional roles like project manager and team leader. The LeSS methodology adheres to the principles and practices of various Agile methods, emphasizing simplicity, transparency, customer focus, and continuous improvement. LeSS prescribes simultaneous ending of sprints for all teams, who work from a common product backlog [12].

LeSS supports a maximum of 64 team members, distributed across up to eight teams. For larger implementations, LeSS Huge offers an advanced model with multiple LeSS structures and additional roles like area-specific product owners.

Nexus

Initiated by Ken Schwaber in 2015, Nexus aims to coordinate multiple Scrum teams, ideally between 3 and 9, in developing a unified product. Nexus extends Scrum's rules, roles, and events, focusing specifically on managing dependencies and synchronizations between teams. The Nexus Integration Team plays a pivotal role in ensuring each sprint's successful delivery. It is comprised of a Product Owner, a Scrum Master, and additional roles specifically dedicated to mentoring and integrating the work of the Scrum teams.

Transparency in Nexus enables the visualization of the integrated status of all product increments, aiding in better coordination and integration.

Scaled Agile Framework (SAFe)

SAFe targets the challenges of agility in large-scale contexts and is structured into three levels: team, program, and portfolio. At each level, SAFe integrates lean and Agile principles and practices, establishing standards for team size and coordination. The framework introduces variations to the

traditional Scrum team, calling it ScrumXP, and allows roles like the Product Owner and Scrum Master to serve multiple teams [13].

The Agile Release Train (ART) is a key construct that synchronizes multiple teams in time-bound "Program Increments," delivering a Potentially Shippable Increment (PSI) every quarter. Portfolio-level considerations in SAFe include investment themes and value streams to align various ARTs.

Scrum @ Scale

Created to scale the Scrum framework for multi-team environments, Scrum at Scale aims to manage the complexity of coordinating multiple teams while delivering customer value. Its structure consists of two cycles: the Scrum Master cycle and the Product Owner cycle, coordinated by a Scrum of Scrums. New roles and events, such as the Scaled Daily Scrum (SDS) and Scrum of Scrum of Scrums (SoSoS), appear to facilitate coordination and transparency across teams [14].

The Executive Action Team (EAT) coordinates higher-level organizational concerns, engaging with managerial and financial divisions for effective scaling.

Spotify

Spotify's unique approach to scaling Agile methodologies is encapsulated in the Spotify Tribe Engineering Model. Comprising seven elements: squads, tribes, chapters, guilds, trios, alliances, and chief architect, the model promotes autonomous cross-functional teams (Squads) that are grouped into feature-focused Tribes. Chapters and Guilds serve as forums for specialization and common interests, respectively [15].

Trios and Alliances are higher-level organizational constructs, the former involving a tribe lead, product area, and design area, while the latter is a combination of three trios. The Chief Architect role is central to maintaining technological integrity and evolving system architecture.

This framework allows Spotify to maintain agility and collaboration at scale, promoting an organic, sustainable growth trajectory for the organization.

2.6.2 Mapping of main Scaled Agile frameworks on socio-technical system principles

In socio-technical systems theory, six foundational principles provide a comprehensive lens for understanding and optimizing complex systems involving both human elements and technological components. These principles are people, infrastructure, technology, culture, processes, and goals [16].

In the context of Scaled Agile transformation, understanding these principles becomes crucial for a comprehensive approach to change management.

The "**people**" principle necessitates a keen focus on role definitions, team dynamics, and individual competencies within the context of Agile implementation. Aligning these human-centric aspects with the social prerequisites of the transformation process not only augments productivity levels but also enhances the general well-being of the workforce.

The “**infrastructure**” principle entails the need to build a robust framework that can support Agile methods. This infrastructure should be designed considering the existing systems in place and how they can be adapted or replaced to suit Agile transformation requirements. It involves both tangible assets, like hardware, and intangible aspects, like software and data architecture.

The “**technology**” principle aligns closely with the technical dimensions of Agile transformation. Technologies should be chosen and implemented in a way that they augment rather than hinder the Agile processes. This requires a deep understanding of how technology interacts with human elements, especially in terms of user experience and interface design.

For the “**culture**” principle, the emphasis is on fostering an organizational culture that is conducive to Agile methods. This involves creating an environment where adaptability, continuous learning, and collaboration are valued. Organizational culture should be evaluated and, if needed, restructured to remove any impediments to Agile transformation.

When discussing “**processes**,” these should be designed or re-engineered to be in alignment with Agile principles. The processes should be iterative, flexible, and should allow for feedback loops. Moreover, they should be set up to permit cross-functional interactions, thereby enhancing both social and technical integration.

Lastly, the “**goals**” of the organization and of the Agile transformation itself should be clearly defined and communicated. These goals act as the driving force behind all activities and decisions. By ensuring that the goals encapsulate both social and technical ambitions, an organization can strive for a balanced and effective transformation.

Utilizing these six principles as a framework, the study conducts a comprehensive analysis and comparison of major Scaled Agile frameworks.

Agile framework	Focus	Goals	Methodology	Scale	Culture	People	Processes	Infrastructure	Technology
Disciplined Agile Delivery (DAD)	Full lifecycle, inception to post-production	<ul style="list-style-type: none"> Balanced transformation, Business and technical alignment 	<ul style="list-style-type: none"> Scrum XP UP Kanban 	Team to organizational levels	<ul style="list-style-type: none"> Adaptive Learning oriented 	<ul style="list-style-type: none"> Role emphasis Human-centric 	Three phases: <ul style="list-style-type: none"> Inception Construction Transition 	Modifiable, both hardware and software	<ul style="list-style-type: none"> Flexible Optimized UI/UX
Large-Scale Scrum (LeSS)	Scaling Scrum	Team organization alignment	<ul style="list-style-type: none"> Scrum Agile practices 	Up to 8 teams	<ul style="list-style-type: none"> Empowerment Decentralized leadership 	<ul style="list-style-type: none"> Feature teams Human interaction 	<ul style="list-style-type: none"> Scrum-based Empirical 	Incremental improvements	<ul style="list-style-type: none"> Agile-supporting technologies
Nexus	Multi-Scrum team coordination	<ul style="list-style-type: none"> Single product backlog, Team alignment 	<ul style="list-style-type: none"> Scrum 	3-9 teams	<ul style="list-style-type: none"> Collaborative Cross-team 	<ul style="list-style-type: none"> Role clarity Inter-team 	<ul style="list-style-type: none"> Scrum extended Dependencies managed 	Scrum extension	<ul style="list-style-type: none"> Iterative development support
Scaled Agile Framework (SAFe)	Large-scale Agile	<ul style="list-style-type: none"> Customer-centricity Business outcomes 	<ul style="list-style-type: none"> Scrum Lean XP 	Three Level <ul style="list-style-type: none"> Team Program Portfolio 	<ul style="list-style-type: none"> Lean-Agile transformation 	<ul style="list-style-type: none"> Defined Agile roles 	Agile Release Trains (ARTs)	Robust Flexible	<ul style="list-style-type: none"> Continuous delivery DevOps
Scrum at Scale	Complex project scaling	Shared vision, alignment	<ul style="list-style-type: none"> Scrum 	Linearly scalable	<ul style="list-style-type: none"> Transparency Inspection 	<ul style="list-style-type: none"> Cross-functional Self-organizing 	Two cycles: <ul style="list-style-type: none"> Scrum Master Product Owner 	Adaptable	<ul style="list-style-type: none"> Scaling support
Spotify Model	Customized to Spotify	Alignment and autonomy	<ul style="list-style-type: none"> Scrum Kanban Team choice 	Up to 100 in a tribe	<ul style="list-style-type: none"> Autonomy Purpose 	Fluid roles: <ul style="list-style-type: none"> Tribe Lead Chapter 	<ul style="list-style-type: none"> Micro-level Agile work 	Flexible	<ul style="list-style-type: none"> Quick iterations UI/UX focus

Table 3 - Mapping of main Scaled Agile frameworks on socio-technical system principles

Focus

In the realm of Agile frameworks, the focus varies significantly, ranging from comprehensive life cycles to specific dimensions such as scaling and coordination. Disciplined Agile Delivery (DAD) offers a wide spectrum of focus, encompassing a product's entire lifecycle from inception to post-production. LeSS and Nexus concentrate on scaling Scrum for large projects and multiple locations, while SAFe aims at large-scale Agile development. In contrast, Scrum at Scale focuses on adapting the Scrum framework for more complex projects. Spotify's model adopts a more tailor-made approach, emphasizing agility based on Spotify's unique organizational needs [17].

Goals

While DAD aims for a balanced transformation journey by clearly defining both business and technical goals, LeSS seeks to align team goals with organizational objectives. Nexus, on the other hand, concentrates on creating a single product backlog to align all teams to shared goals [18]. SAFe places a strong emphasis on customer-centricity and value delivery, aligning goals with business outcomes. Scrum at Scale and Spotify are unique in ensuring all teams have a shared vision and common set of goals, with a particular focus on alignment and autonomy.

Methodologies incorporated

DAD integrates multiple methodologies like Scrum, Extreme Programming (XP), Unified Process (UP), and Kanban, offering a rich tapestry of methods for Agile development. LeSS and Nexus extend the Scrum framework, incorporating other Agile practices where applicable. SAFe amalgamates Scrum, Lean, and XP, offering a more eclectic approach. Scrum at Scale sticks to Scrum methodology while the Spotify Model gives teams the discretion to choose from Scrum, Kanban, and other Agile practices [19].

Scale

When it comes to scalability, DAD offers tactical and strategic agility at both team and organizational levels. LeSS and SAFe provide specific models for larger scale projects, such as LeSS Huge and the Portfolio level in SAFe. Nexus aims at medium sized projects involving 3 to 9 Scrum teams, while Scrum at Scale focuses on linear scalability across multiple Scrum teams. Spotify's model is designed for tribes of up to 100 people, offering a balance between scale and agility [20].

Culture

Cultural attributes differ across frameworks, with DAD encouraging an adaptive, learning culture. LeSS advocates a culture of empowerment and decentralized leadership, while Nexus and Scrum at Scale foster a culture of collaboration, transparency, inspection, and adaptation. SAFe facilitates a Lean-Agile transformation, emphasizing adaptability and a customer-centric focus. The Spotify model values a culture of autonomy, mastery, and purpose [21].

People

In the people dimension, DAD emphasizes roles rather than job titles, leaning towards a more human-centric nature of Agile teams. LeSS focuses on feature teams over component teams, while Nexus emphasizes role

clarity and inter-team coordination. SAFe and Scrum at Scale delineate clear roles like Product Manager and Scrum Master but adapt them to fit the scaling context. Spotify introduces unique roles like Tribe Lead and Chapter, advocating for fluid and adaptive team structures [22].

Processes and lifecycle phases

DAD's lifecycle comprises three main phases: Inception, Construction, and Transition, offering a more structured approach. LeSS and Nexus follow Scrum-based lifecycles, with Nexus adding dimensions for dependencies and synchronisms. SAFe builds its processes around Agile Release Trains (ARTs) with specific timeboxes. Scrum at Scale introduces two cycles, the Scrum Master cycle, and the Product Owner cycle. Spotify, however, avoids defining explicit lifecycle phases, focusing instead on Agile work methodology at a micro-level.

Infrastructure and technology

Infrastructure and technology considerations vary across these frameworks. DAD allows for modifiable infrastructure to suit Agile methods, including both hardware and software requirements. LeSS and SAFe advocate for an IT environment that is both robust and flexible. Nexus and Scrum at Scale assume that the existing infrastructure can be adapted for Scaled Scrum, while Spotify's model remains flexible in this regard. On the technology front, most frameworks emphasize technologies that facilitate iterative development, continuous delivery, and excellent user interface and experience [23].

2.6.3 Main challenges in scaling Agile in large enterprises

Successfully integrating Agile methodologies within an organization requires overcoming multiple layers of resistance. This resistance comes in various forms and complexities, each with its own set of challenges and implications. A detailed examination of these sub-challenges follows, with the aim of facilitating a nuanced understanding that can guide targeted intervention strategies.

2.6.3.1 Resistance to change

Comfort zone disruption - The inertia dilemma

Employees often find comfort in established routines, workflows, and job descriptions. The introduction of Agile methodologies tends to disrupt these well-entrenched patterns. This disruption manifests as resistance to change, usually because of a lack of understanding of Agile benefits or due to apprehensions about new responsibilities. Inertia can be so strong that even in organizations with a history of being open to change and innovation, resistance remains prevalent. This form of resistance tends to reduce the overall speed of Agile adoption and can cause productivity losses, particularly during the transitional phase [24].

Skepticism about Agile - Myths and misunderstandings

Skepticism about the efficacy of Agile methodologies is another barrier. This skepticism is not just restricted to front-line employees but can extend to department heads and even executives. Often, resistance stems from myths or misunderstandings about what Agile can or cannot do. For example, the misconception that Agile is only suitable for small projects can hinder its adoption in enterprises that primarily deal with large-

scale initiatives. Such skepticism may require educational programs to demystify Agile practices and demonstrate their applicability across a range of project sizes and complexities [25].

Too much enthusiasm - The double-edged sword

Surprisingly, too much enthusiasm can also be a barrier to effective Agile adoption. Initially, teams may approach Agile methodologies with an almost evangelical zeal, only to lose interest when the transition does not yield immediate benefits. Over-enthusiasm can also result in a rigid and dogmatic approach to Agile practices, which is counter to Agile inherent flexibility. Teams may adopt Agile frameworks with high fidelity but without adapting them to their unique organizational context, thereby missing out on the benefits of agility [11].

Top-down resistance - The imposed change problem

When the decision to adopt Agile methodologies originates from senior management without adequate buy-in from operational staff, it can result in substantial resistance. Employees, feeling that the changes are being imposed from the top, may not only resist but also become disengaged, reducing their commitment to the organization's objectives. This form of resistance is heightened when the rationale behind the Agile transformation is not adequately communicated, causing fragmentation in the organization's understanding and interpretation of Agile principles [26].

Bottom-up reluctance - The control paradox

In instances where the drive for Agile adoption emerges from team-level initiatives, managerial reluctance can become an impediment. Senior and middle management may perceive Agile as a dilution of their control and authority. They may withhold critical resources or provide lukewarm support that undermines the transition process. To counteract this, targeted training may be needed for management to understand that Agile, while promoting team autonomy, also requires effective leadership to align individual efforts with organizational goals [27].

2.6.3.2 Lack of Agile knowledge

Insufficient training and coaching - The unavailable resources

Lack of training and coaching are often glaring issues in the Agile transformation journey. This deficiency usually results from managerial hesitance to allocate sufficient funding for these activities. In some instances, this reluctance has led to teams being ill-prepared for the Agile shift, causing the eventual abandonment of Agile methodologies. An even less severe but still problematic outcome is reduced team motivation due to inadequate training [28]. Moreover, in environments where multiple teams require coaching, the demand frequently surpasses the capacity of available coaches. When it becomes challenging to fill coaching roles with experienced individuals, organizations sometimes resort to appointing less seasoned Agile practitioners. This creates a risk of improper instruction in Agile practices, leading to unsuccessful broader adoption after initial pilot successes [29].

Misinterpretation of Agile concepts - The knowledge gap

When teams within the same organization adopt Agile methodologies without unified guidance, the resulting inconsistency can lead to friction and fragmentation. This divergence complicates task allocation when there is a need to move people between teams. Standardizing Agile approaches across teams is essential to mitigate these challenges and facilitate effective forecasting and benchmarking. Various misconceptions about what Agile development entails often create obstacles. For example, the failure to comprehend the core values of the Agile manifesto can lead to skewed practices, like focusing merely on faster product delivery at the managerial level. Misunderstandings at the team level include perceiving Agile as an excuse for sloppy development practices or as a threat to individual career growth. These misconceptions can result in poor implementation, such as teams presenting unfinished work during reviews and accumulating backlogs of bugs [30].

Partial and inaccurate Agile adoption - The customization pitfall

Poor customization of Agile practices to fit organizational needs can further compound the challenges. In some instances, this has led to skipping essential Agile practices, thus failing to enact meaningful change. Other pitfalls include replacing Agile terminology with familiar but outdated language, thereby stifling new ways of thinking and impeding cultural transformation [31]. In some cases, the adoption of Agile is misunderstood to be synonymous with the use of specific tools or management software. This shallow focus on tools, instead of the principles they are designed to facilitate, often leads to frustration and ineffectiveness [32].

Ambiguity in managerial roles - The hierarchical conundrum

The role of middle management in an Agile transformation often remains nebulous, contributing to the challenges faced. This uncertainty is problematic, as middle management is crucial in facilitating the cultural shift required for Agile transformation. Attempts to blend traditional managerial roles with Agile responsibilities, like combining project management with Scrum Master duties, frequently result in conflicts of interest and ineffective guidance. This can morph managerial roles into ones that police rather than support teams, thus defeating the purpose of Agile adoption [26] [27].

2.6.3.3 Transition turbulence

Waterfall persistence - The management quandary

Even after adopting Agile, management in some organizations continues to adhere to the waterfall model, creating a paradox in Agile implementation. Such persistence often manifests as an emphasis on up-front project planning and frequent meetings, irrespective of the Agile methods in place. This inconsistency undermines confidence in Agile, especially when reports are not delivered in familiar formats, making Scrum teams appear unreliable [33]. Moreover, challenges faced during Agile transformation can cause teams to revert to familiar traditional practices. Stress stemming from schedule pressures and change overload can pull people back into old ways of working, undermining Agile transformation efforts.

Legacy commitments - The transformational trap

Failure to adjust workloads to facilitate Agile transformation can lead to unsuccessful implementation. Teams that start the Agile journey in a state of over-commitment find it hard to adapt, making it difficult to absorb new working methods and learn Agile practices. Moreover, in the wake of Agile transformation, some organizations hold fast to old commitments, leading to task overload and the neglect of new Agile practices. This focus on previous engagements can result in specific personnel becoming overloaded with work, thereby pushing the Agile method to the breaking point [33]. In addition, the inability to reconfigure physical spaces as per Agile guidelines presents another challenge. Resistance to changing office layouts not only affects team dynamics but also impedes Agile events such as daily stand-ups, as dedicated rooms may not be available, necessitating the booking of conference rooms [34].

Concurrent methodologies - The dual system approach

During transitional phases, especially when organizations are navigating the waters of digital transformation, they sometimes opt to run Agile and traditional methodologies simultaneously. This decision is usually driven by the belief that it offers a safety net, allowing them to harness the advantages of Agile while retaining the perceived stability of traditional methods. However, this dual approach often introduces unforeseen complexities. Organizational tensions arise due to differing priorities and operational paces between the two methodologies. Teams working with traditional methods, for instance, might work towards long-term goals with extensive planning phases, while Agile teams operate in short, iterative cycles focused on delivering incremental value. These disparities can strain inter-team communications and mutual understanding [35].

Persistent bureaucracy - The procedural hurdle

The persistence of old bureaucratic practices, even after Agile adoption, poses challenges. Agile teams often must comply with old procedures, leading to excessive documentation and multiple approval gates that stifle Agile practices. Moreover, pre-existing internal silos, both in terms of boundaries and specialized knowledge, can complicate Agile implementation. Conflicting team priorities and frequent relocations to match skill demands create planning difficulties, making it hard to implement Agile uniformly across the organization [36].

2.6.3.4 Multi-team environments

Coordination complexities - The inter-team challenge

Difficulties in interfacing between multiple Agile teams often emerge as a prominent challenge when organizations scale their Agile practices. This complexity, rooted in the nature of Agile itself, stems from its primary focus on individual teams. Agile methodologies prioritize the autonomy and self-organization of single teams. They advocate for small, cross-functional teams that can independently manage, develop, and deliver increments of the product. However, when multiple Agile teams work on different components of a large product or various projects within the organization, challenges arise. These teams, while Agile in their isolated capacities, often have interconnected work. They might depend on each other for shared resources, data, or functionalities. Such dependencies, if not managed effectively, can introduce delays, bottlenecks, and misalignments [37].

Autonomous overreach - The contextual disconnect

Organizations sometimes design team models around high levels of autonomy, aligning well with Agile principles. However, issues emerge when these autonomous teams focus solely on their individual goals at the expense of organizational objectives. Such an approach hampers cross-team coordination, particularly when different teams work for different clients, but their applications are interconnected. Even minor deviations, such as differing sprint durations across teams, can result in delivery delays. Moreover, exposing other parts of an organization to Agile methodologies often encounters resistance, particularly from departments that are not directly involved in development activities or technology-oriented tasks. This tension undermines the holistic adoption of Agile, as achieving full transformational benefits requires an organizational-wide paradigm shift. Departments ranging from marketing and sales to finance and legal are among those most affected by this challenge [38].

Global scope and local constraints - The geographical quagmire

Scaling Agile across geographically distributed locations introduces unique challenges, including missing key meetings and difficulties coordinating across time zones. While waterfall methodologies might allow for isolating different project segments at disparate locations, Agile collaborative nature complicates this approach. Distributed organizations need to invest extra effort into maintaining effective communication when implementing Agile [39].

Reward mechanisms - The HR conundrum

Human Resources departments sometimes inadvertently act against Agile adoption by maintaining reward structures focused on individual performance. Such a model contradicts Agile team-centric philosophy, thereby undermining its full implementation. In extreme cases, the practice of tracing failures back to individual team members has been reported, which is contrary to Agile principles [40].

2.6.3.5 Requirement and progress management

High-level requirements - The complexity quandary

In large development projects, it becomes apparent that high-level requirements management is not only essential but also complex. While some Agile methods like DSDM provide a structured approach to high-level requirements management, widely adopted ones like Scrum and XP do not offer this. The issue amplifies when product complexity necessitates multiple layers of product management. Moreover, when requirements are formed by multiple stakeholder groups and development teams cannot maintain direct contact with them, the absence of high-level requirements management becomes a major hindrance [41].

Requirement elaboration - The refinement dilemma

Organizations often initially define requirements at a very high level, documented in marketing requirements documents or functional specifications. These high-level requirements then need to be broken down into detailed tasks that Agile development teams can handle. When, how, and to what level these requirements should be elaborated become intricate questions to answer, affecting the efficiency of the entire development process [41].

User stories creation - The estimation impasse

The Agile development model creates a dichotomy between long-term and short-term planning. Agile backlogs typically focus on immediate tasks, neglecting the need for long-term planning. Balancing both without compromising the agility of the development process poses a set of unique challenges. Both product managers and business analysts face challenges in creating high-level requirements that are broken down by development teams for effort estimation. Large chunks of requirements delivered by high-level product management result in development teams investing considerable time in defining suitably sized stories. Furthermore, mastering the process of creating user stories demands significant learning and adaptation, both for product management and development teams [42].

Product release - The timing challenge

Agile emphasis on short development cycles can clash with the need for long lead times in certain release activities. Marketing departments, for example, may require three months to prepare a product launch, but Agile development flexible approach to feature development complicates this process [43]. Moreover, the iterative nature of Agile development impacts timings in the software delivery life cycle, often causing issues in coordinating with other organizational functions. Functions that were previously committed to a long-term plan now need to adapt to incremental deliveries, which can disrupt existing processes and schedules.

Compliance constraints - The Agile-regulation clash

Certain regulatory processes play a crucial role in the business operations of various industries, especially those involved in international trade or dealing with sensitive technologies. One such process is the acquisition of export clearances and licenses. These permits ensure that goods, technologies, or services comply with a country's export regulations and are critical for businesses that wish to operate in the global marketplace. To obtain these clearances, organizations often need to provide detailed specifications of the product, including its features, functionalities, and sometimes even its underlying technologies. [44, 45].

2.5.4 Main success factors to scale Agile transformation in large enterprises

Successfully integrating Agile methodologies within an organization does not merely depend on addressing potential resistance, but also on harnessing key success factors that propel Agile transformations forward. These success factors play a pivotal role in ensuring that the Agile transition is not only smooth but also sustainable in the long run. A comprehensive exploration of these crucial elements is presented below, with the intent of providing a strategic blueprint for organizations aiming to thrive with Agile.

2.6.4.1 Management and leadership support

Management support - The crucial foundation

The necessity of solid management support in the adoption of Agile methodologies is paramount. Upper management's engagement and commitment are instrumental in effecting substantial change, such as the switch to Agile. Managers play a critical role in ensuring the longevity of this change, as they have the authority to remove obstacles. Their support is also vital in situations requiring adjustments to release schedules and in the allocation of additional resources for training and coaching. Moreover, an overt display of managerial involvement serves as a motivating factor for employees. Such visibility encourages staff to

embrace new ways of working. Examples include training sessions directly organized by senior executives and their consistent presence at development events like sprint demos. The visible backing from corporate level often catalyzes spontaneous Agile adoption within teams [46].

Mapping to previous workflows - A strategy for management buy-in

While Agile often demands a substantial shift in working methods, some level of mapping to older practices can ease the transition. In some instances, it's possible to present Agile as a natural evolution of existing practices, rather than a disruptive change. Such a mapping strategy often helps in securing management buy-in and facilitating a smoother transformation process [47].

Coordinated change leaders - Orchestrators of transformation

Transitioning an organization's way of working demands coordinated leadership. Beyond the guidance offered by Agile coaches, specific change leaders also play a significant role. These leaders often act as the spokespeople for the transformation process and might comprise a multi-disciplinary team representing different parts of the organization. The accountability extends to line and project managers who also serve as agents of change [48].

Unbiased change leaders - The advantage of fresh perspectives

There exists an advantage in engaging change leaders free from prior organizational constraints or conflicts. Whether new hires or external consultants, these leaders can concentrate exclusively on effective Agile implementation. Their impartial viewpoint enables a clear assessment of areas needing adjustments in the Agile adoption process.

Product owner role - The voice of the customers

The effectiveness of the Product Owner role stands as a pivotal factor in Agile transformation. Numerous instances have highlighted the consequential impact of this role on the success or failure of Agile projects. Notably, when this role is well-defined and well-executed, it leads to increased team performance and accurate work products. Early engagement of Product Owners is vital, and in many cases, these individuals become advocates for Agile methods, fostering collaboration between business and technology departments [49].

2.6.4.2 Training and coaching

Agile training - A lever for successful transformation

Training in Agile methods remains foundational to the chances of success in organizational transformation. This training extends beyond skill development to also influence attitudes towards change. Studies corroborate that the quality and extent of training play a decisive role in the success or failure of an Agile transformation. Training serves not only as a skill-building platform but also as a medium for changing organizational attitudes. Further deepening the efficacy of training initiatives, the acquisition of external expertise has been highlighted as a potent success factor. The external expert often acts as a knowledge multiplier within the organization, enabling a nuanced understanding that general and theoretical advice might not provide [50].

[Agile coaching - Navigating practical application](#)

Agile coaching is an invaluable asset in the Agile transformation journey, given that Agile prioritizes mindset over prescriptive practices. Real-time coaching offers significant benefits in guiding teams through the practical implementation of Agile methods. Coaches serve as mentors and course correctors, directing the teams towards an understanding of Agile principles. The utility of both internal and external coaches has been emphasized, combining organizational familiarity and impartial perspectives. Moreover, the specificity of coaching is vital. Coaching should delve deep into both Agile values and processes for a balanced understanding. It should encourage a culture of constant learning and adaptability, rather than rigidity towards a particular method. Coaching should be systematic, featuring recurring events, external expert presentations, and communities of practice, to ensure adequate coverage and prevent misguided Agile adoption [51].

[Agile education for management - The road to effective implementation](#)

Educational initiatives targeted at management continue to be crucial for earning Agile support. These educational programs help in averting a top-down, command-and-control approach, thereby promoting Agile adoption. A well-structured educational program can even convert potential detractors into Agile champions by dispelling myths and facilitating the uniform implementation of Agile methods across the board [52].

[Product owner training - Integrated pathways to Agile success](#)

Educational initiatives targeted specifically at the Product Owner role not only emphasize critical Agile principles but also delve into backlog management, user story breakdown, and Agile planning. Concurrently, these initiatives also address the broader challenge of requirements management by teaching how to skillfully break down high-level requirements into manageable user stories. Providing specialized tool support and facilitating open communication between Product Owners and teams serve to make this integration seamless. When both specialized training for Product Owners and adept requirements management are harmoniously implemented, they serve as pivotal elements in the successful adoption of Agile methodologies [52].

[Customization of Agile approach - Tailoring for organizational fit](#)

Customization remains a recurrent theme in the successful implementation of Agile. Teams often need to adapt standard Agile practices to suit their unique requirements and contexts. Any customization must align with core Agile principles. The process of customization is never static; it requires continual adjustments and periodic evaluations. Additionally, the importance of a single, unified approach to Agile cannot be overstated. A unified approach simplifies terminology, enhances cross-team collaboration, and facilitates the scaling of Agile practices. This uniformity also aids in performance tracking, given the standardized metrics across diverse teams [53, 54].

[2.6.4.3 Clear and smooth transition](#)

[Making change non-negotiable - The path to irreversible transformation](#)

Feedback from personnel remains a key consideration; however, the focus should be on conveying the irrevocable nature of the new working paradigm. In instances where the transformation is wide-ranging, the

sheer scale serves as a testament to its non-negotiable status. This eliminates counterproductive debates about the efficacy of specific methodologies such as Scrum and encourages adherence to new operational strategies. Organizations with deeply rooted cultures should perpetually reinforce the change vision, celebrating each progressive step as a victory. Mechanisms that mandate change, such as periodic deliverables, can also serve to instill a sense of urgency and a drive for change [25].

[Sustaining strong commitment - Preserving resolve through challenges](#)

The commitment from leadership serves as the cornerstone for transformative efforts, especially when challenges threaten to derail the process. The adoption of Agile practices aims to rectify existing operational inefficiencies but may also unveil latent organizational challenges. A strong commitment is manifest in a focused adherence to chosen Agile practices, constant evaluation of their efficacy, and explicit communication of expectations to the teams. This level of dedication assures teams that the transformation is both necessary and beneficial [55].

[Pilot implementation - Building credibility and acceptance](#)

The initiation of pilot projects has emerged as a significant success indicator in several instances. These pilots cultivate organizational confidence in Agile methodologies and enhance general acceptance both at the management and operational levels. Management approval often follows successful pilot outcomes, serving as an impetus for broader adoption across various departments. Moreover, the utility of pilot projects extends beyond initial acceptance; they also act as learning platforms for the organization. These pilots provide insights into the most effective ways to introduce new methodologies to teams and management, serving as risk-mitigation tools for larger-scale transformations [56].

[Simplicity in practice and process - Focusing on what works](#)

A recurring recommendation advocates for the simplification of organizational structures and processes, especially in complex and global settings. Simplification not only alleviates the complications associated with the implementation of Agile practices but also garners favorable responses from both employees and management. The focus should be placed on engaging team members and establishing processes based on proven practical results [57].

[2.6.4.4 Team engagement](#)

[Identify Agile advocates - Guiding change through right personnel](#)

The identification of individuals predisposed to Agile methodologies proves vital for steering transformation in the intended direction. While technical competency remains a factor in team composition, the integration of individuals with suitable personalities gains emphasis for Agile teams. The presence of individuals opens to collaboration and willingness to discard preconceptions catalyzes the change process. Moreover, the inclusion of staff with prior Agile experience significantly enhances the initiation phase of transformation. This experience plays a critical role in enabling entire departments, such as product management, to transition towards Agile methodologies. The integration of Agile-experienced developers into teams serves to elevate the team's overall understanding and execution of Agile development [49].

Business & technology buy-in - Broadening stakeholder acceptance

Involvement of both business and technology departments proves essential in expanding stakeholder acceptance during Agile transformation. Methods like online feedback channels and numerous feedback sessions are instrumental in fostering a collaborative atmosphere. This unified approach not only garners organizational support but also encourages active engagement across business and technology sectors in the newly adopted Agile practices [58].

Teams and squads self-organization - Fostering ownership and commitment

Self-organization within teams and squads significantly contributes to the internalization of Agile methodologies. Management's inclination towards directives often stunts this organic growth of Agile frameworks. In contrast, teams and squads that are allowed the autonomy to self-organize experience an increase in both ownership and commitment. This empowerment not only leads to a more thorough adoption of Agile practices but also elevates overall productivity and team morale [38] [59].

Decentralized adoption - Harnessing bottom-up support for Agile transformation

In the face of diminishing returns from top-down initiatives, a decentralized approach gains prominence. Encouraging teams to independently develop and showcase Agile best practices not only transfers ownership but also reinforces the internalization of new methodologies. The voluntary adoption of Agile methods by individual teams, unencumbered by overarching mandates, fosters authentic bottom-up support. This decentralized strategy allows teams the flexibility to adapt Agile practices to their specific contexts, culminating in a more organic and successful transformation.

2.6.4.5 Culture and Communication

Sponsoring Agile change - Effective communication

Clear messaging forms the backbone of a successful Agile transformation. Utilizing multiple channels like interactive workshops, coaching sessions, and newsletters ensures that the new Agile approach is understood and embraced. While the concept of overcommunication might seem counterintuitive, it solidifies understanding and buy-in. Moreover, outlining the goals of the Agile transformation brings clarity and purpose to the organization. Special communication events serve to reiterate the benefits and the 'why' behind the transition, boosting overall enthusiasm and commitment [60].

Highlighting early success - Creating positive momentum

Celebrating early wins, however small, can serve as a catalyst for change. Showcasing these successes not only piques interest but also strengthens the organization's commitment to the Agile path. This early momentum can lead to further resource allocation for training and coaching, propelling the transformation forward. However, transparency is crucial for Agile transformation. Sharing both successes and challenges openly fosters a culture of trust and enables quick adaptation. This culture aligns all team members, keeping everyone focused and moving in the same direction [61].

Agile communities - A catalyst for change

The formation of Agile communities has proven to be a vital element in facilitating Agile transformation. These communities act as a force capable of overcoming challenges that might be too formidable for individuals to tackle alone. Furthermore, these Agile communities serve as incubators for Agile awareness, creating champions who further spread the Agile ethos [62].

Organizational alignment - Speaking a unified language

The alignment of objectives across all organizational levels stands as an imperative factor for the large-scale adoption of Agile methods. Success stories should be promoted, and challenges must be collaboratively addressed to achieve this alignment. In some instances, a structured roll-out process has been employed to ensure a uniform transition to Agile practices across multiple teams [59].

2.6.5 Most impacted domains of a large-scale Agile transformation

The systematic literature review reveals that specific categories of challenges associated with adopting Scaled Agile methodologies are effectively addressed by corresponding categories of success factors. Each challenge category is mapped to a success factor category, providing a clear strategy for overcoming obstacles in Scaled Agile adoption. Below, each challenge category is discussed along with its related success factor category (Figure 9):

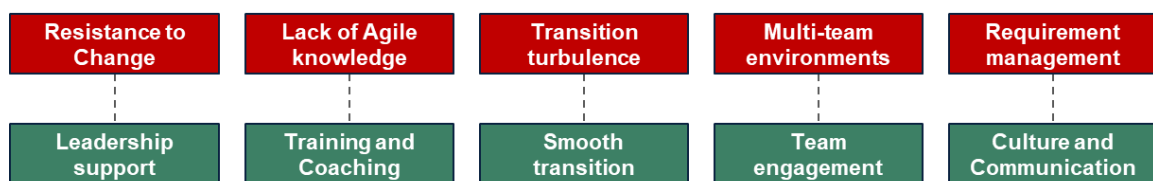


Figure 9 - Mapping of key challenges and related success factors

Resistance to Change - Leadership Support: Resistance to change is a significant barrier in the adoption of Scaled Agile, often stemming from fear of the unknown and reluctance to alter established workflows. Strong leadership support is crucial in guiding and motivating the organization through this transition. Effective leaders set a clear vision, demonstrate commitment to the Agile transformation, and actively engage with teams to address their concerns. This not only removes resistance but also boosts the overall adoption of Agile methodologies by fostering an environment of trust and openness.

Lack of Agile Knowledge - Training and Coaching: The lack of understanding and expertise in Agile principles among team members can impede effective implementation. Comprehensive training and coaching are essential to equip teams with the necessary skills and knowledge. Structured training programs and ongoing coaching reinforce Agile practices, ensuring that teams are well-prepared and confident. This approach not only mitigates the knowledge gap but also accelerates the adoption of Agile by building a solid foundation of expertise within the organization.

Transition Turbulence - Smooth Transition Strategies: Transition turbulence can disrupt workflows and cause confusion during the shift from traditional project management to Scaled Agile. Implementing smooth transition strategies, such as phased rollouts and clear communication plans, minimizing disruptions and ensuring a seamless shift to Agile practices. These strategies provide the necessary support during the

transition period, helping to manage expectations and reduce resistance, thereby facilitating a smoother and more efficient adoption of Agile methodologies.

Multi-team Environments - Team Engagement: Large enterprises often struggle with coordination and communication in multi-team environments. Fostering team engagement is essential to align goals and ensure cohesive efforts towards common objectives. Regular cross-team meetings and the use of collaborative tools enhance engagement and coordination. By promoting a culture of open communication, organizations can effectively manage multi-team environments, thereby improving the efficiency and effectiveness of Agile adoption.

Requirement Management - Culture and Communication: Requirement management in a Scaled Agile framework can be complex, especially with diverse stakeholders and evolving needs. Cultivating a strong culture of communication is vital to ensure that all requirements are understood and addressed. Open and transparent communication channels help in aligning requirements and fostering collaboration among stakeholders. This approach not only resolves requirement management issues but also enhances the overall Agile adoption process by ensuring that all stakeholders are on the same page.

2.7 Theoretical gaps emerging from the literature review and positioning of the thesis

The systematic literature review reveals a wide but fragmented body of knowledge on Scaled Agile transformation. Contributions typically analyse isolated elements such as individual frameworks, specific success factors or particular categories of challenges, without linking these findings into a sequential understanding of how large enterprises experience Agile scaling over time. Evidence is also dispersed regarding which organizational domains absorb the highest impact during transformation, with no consolidated view of how social and technical dimensions interact. The table below synthesizes the main findings while explicitly highlighting the theoretical gaps that define the conceptual space addressed by the thesis (Table 4).

Theoretical gaps in literature review	Theoretical space addressed by the thesis
Lack of a process oriented classification linking success factors to specific transformation stages	Development of a sequential interpretation that connects success factors to the unfolding dynamics of Agile scaling
Absence of an integrated view showing how challenge categories interact and evolve during the scaling process	Modelling of challenge interdependencies and identification of recurrent patterns in large enterprise environments
Limited comparisons linking framework features to transformation processes rather than structural attributes	Socio technical evaluation of frameworks according to their influence on change dynamics across the scaling journey
Lack of empirical integration between socio technical principles and success factors and challenges	Use of socio technical principles to determine which domains are most affected in large scale Agile transformation
No consensus on which domains absorb the highest transformation pressure or why certain areas become leverage points	Identification of priority domains through the cross mapping of challenges and success factors
Lack of consolidation across contexts and absence of unified analytical frameworks	Construction of a cross domain synthesis that reduces fragmentation and integrates dispersed findings

Table 4 - Synthesis of literature findings and emerging theoretical gaps

The synthesis makes clear that the literature offers valuable but disjointed insights that do not yet converge into a coherent, process based understanding of Agile scaling in large enterprises. By addressing the missing links between challenges, success factors and organizational impact domains, and by framing them within an integrated socio technical interpretation, the thesis positions itself within the theoretical gaps highlighted above and provides a consolidated foundation for advancing enterprise level agility.

2.8 Influential authors and reference journals in scaled Agile transformation research

The systematic literature review not only consolidates the current state of scholarly knowledge on scaled Agile transformation but also provides a foundation for future extensions of the review. As the field continues to evolve, this corpus can serve as a reference point for new investigations focused on specific subdomains, such as multi team coordination, Agile governance, or socio technical dynamics. Within this perspective, the analysis of the selected publications reveals a clearly identifiable core of influential authors, high impact academic journals and recurrently cited conference venues that shape the international debate on Agile transformation at scale. These elements represent the intellectual infrastructure of the domain and constitute the natural starting point for future research and for subsequent updates of the systematic review.

2.8.1 Influential authors

The corpus shows a concentration of contributions around a small number of authors who have played a significant role in shaping the empirical and conceptual foundations of scaled Agile transformation.

- **Klaus Dikert, Maria Paasivaara and Casper Lassenius:** These authors appear prominently in the review through multiple publications [3, 12], as well as indirect citations [39]. Their work is deeply embedded in the empirical study of large scale Agile transformations, with a focus on challenges, patterns and organizational change dynamics in distributed and complex environments. Their research consistently informs international discussions on the conditions that enable or hinder Agile scaling.
- **Nils Brede Moe and Tore Dingsøy:** These authors are central figures in the Scandinavian research tradition on Agile development [6, 38, 59]. Their work explores inter team collaboration, distributed Agile settings and the socio technical features of large scale Agile organizations. Their empirical orientation and sustained publication record position them as key contributors in understanding coordination, communication and knowledge sharing in scaled Agile contexts.
- **Dean Leffingwell:** Although his name does not appear explicitly in the bibliographic list, the corpus includes several studies on the Scaled Agile Framework [13, 39, 47, 63], for which he is the principal creator. His influence therefore manifests indirectly through the widespread academic examination of the SAFe framework. His conceptual contribution has shaped much of the contemporary discourse on Agile scaling models.
- **Karl Skogmar and Håkan Sundmark:** Their names do not appear directly in the selected publications. However, they are well known within the broader Agile community, particularly in relation to large scale software engineering. Their absence from the review corpus indicates that, in the specific sample analyzed, their work is not among the dominant references.

2.8.2 Reference academic journals

The review highlights several journals that serve as primary publication venues for research on scaled Agile transformation. These journals represent the disciplinary space where empirical and conceptual advancements in Agile scaling are most frequently disseminated.

- **Journal of Systems and Software:** Appearing in multiple entries [3, 19, 20], this journal is a leading outlet for empirical and applied research in software engineering, including Agile transformation in complex organizational environments. Its presence in the corpus indicates its centrality in shaping academic discussions on large scale Agile practices.
- **Information and Software Technology (IST):** Referenced in multiple entries [21, 28, 41], IST frequently publishes studies on Agile methods, socio technical coordination, and organizational change in software intensive contexts. Its representation reflects the journal's status as a key contributor to the empirical foundation of Agile scaling.
- **Empirical Software Engineering (EMSE):** Appearing in a single but important paper [59], this journal is recognized for high quality empirical studies grounded in rigorous methodological designs. Its presence in the corpus evidences the significant role of empirical inquiry in understanding Agile transformation at scale.
- **IEEE Software:** Referenced in a single but important paper [15], this journal occupies an influential position as an interface between academic research and industrial practice. Its inclusion confirms its role in disseminating practitioner relevant insights on Agile adoption and scaling.

2.8.3 Relevant conference venues

The corpus also includes citations from highly regarded conference proceedings, which reinforce the role of conference led dissemination in the Agile research community. These conferences often publish cutting edge or early phase studies and are considered authoritative platforms in software engineering and Agile research.

- **XP Conference** [6, 57]: A key venue for research on Agile methods and extreme programming, with strong emphasis on empirical findings and organizational transformation.
- **International Conference on Software Engineering (ICSE)** [11, 45]: The premier conference in software engineering. Its inclusion demonstrates that Agile at scale is not only a niche topic but also relevant to the broader software engineering research community.
- **Agile Conference** [7, 8, 32]: A specialized venue dedicated to Agile methods, frequently hosting studies on frameworks, adoption patterns and organizational change processes.
- **International Conference on Agile Software Development (ICASD)** [10, 47]: An important platform for research on Agile teams, scaled practices and organizational adaptation.

Together, these venues reflect the interdisciplinary and empirically grounded nature of research on scaled Agile transformation and form a characteristic landscape that future studies should continue to monitor and engage with.

3 Enterprise Survey

In today's rapidly evolving technological landscape, companies are increasingly adopting Agile transformations to manage constant change and to engage customers directly in the production phase of digital services, rather than only at the end. The rise of cloud computing, the Internet of Things (IoT), and the disruptive advent of artificial intelligence (AI) have significantly heightened this need [64].

Agile methodologies provide a framework for businesses to be more responsive, flexible, and customer focused. By involving customers early and continuously throughout the development process, companies can ensure that the final products and services are better aligned with customer needs and market demands. This shift is crucial in an environment where technological advancements occur at an unprecedented pace, and customer expectations are continually evolving.

The adoption of cloud computing has transformed how businesses operate, offering scalable resources, cost efficiencies, and enhanced collaboration capabilities. It allows for rapid deployment of applications and services, which is essential for maintaining agility in a competitive market. Similarly, IoT has expanded the possibilities for data collection and real-time analytics, enabling businesses to make more informed decisions and create more personalized customer experiences.

Artificial intelligence, the most disruptive of these technologies, has opened new avenues for innovation and efficiency. AI-driven insights and automation can drastically reduce time-to-market, improve product quality, and enhance customer interactions. However, the integration of AI into business processes also presents significant challenges, including data privacy concerns, ethical considerations, and the need for specialized skills and knowledge [65].

Given these dynamics, it is imperative to understand how businesses are navigating their Agile transformation journeys. This survey was conducted to validate and compare the results emerging from the literature review. It aims to assess the actual impact of identified challenges and success factors on Agile transformations. By collecting data directly from companies undergoing these changes, the survey seeks to provide a comprehensive understanding of the practical implications and outcomes of Agile practices in the current technological context.

3.1 Survey objectives

The survey's objectives are multifaceted, aiming to provide a comprehensive understanding of Agile transformations. The survey seeks to:

- **Validation of literature findings:** Confirm whether the theoretical challenges and success factors identified in academic research align with the real-world experiences of companies
- **Impact assessment:** Evaluate the actual effects of these challenges and success factors on the success of Agile transformations
- **Critical domains identification:** Identify the specific domains and areas within businesses that are most critical for a successful Agile transformation, including understanding which aspects of the business are most impacted by Agile practices

- **Strategic insights:** Offer actionable insights and recommendations for businesses aiming to embark on or improve their Agile transformation journeys, highlighting best practices, common pitfalls, and strategies for overcoming challenges

In detail, the survey also aims to validate specific hypotheses that examine the relationship between industry, company size, and Agile performance. Specifically, it addresses the following key questions:

1. Are companies in the telecom, media, and technology sectors advantaged in Agile adoption due to their predisposition for technological innovation?

This question explores whether organizations in these sectors, known for rapid technological innovation, experience fewer challenges in adopting and scaling Agile methodologies compared to other sectors. The survey will evaluate whether their focus on innovation and digital transformation gives them an inherent advantage in successfully implementing Agile frameworks.

2. Are mid-to-large-sized companies (e.g., 251-500 and 500-1000 employees) able to achieve better Agile performance due to reduced scaling complexities?

This question explores whether mid-to-large-sized companies perform better in Agile adoption because their transformation efforts require less scaling compared to giant enterprises. The survey will assess whether the smaller scale of transformation in these companies contributes to more effective and streamlined Agile implementation, allowing them to achieve improved performance metrics.

3. Are mid-to-large-sized companies (e.g., 251-500 and 501-1000 employees) less impacted by the challenges of Agile adoption compared to giant enterprises (e.g., 1001-5000, 5001-10000, 10000+ employees)?

This question aims to investigate whether mid-sized organizations face fewer barriers during Agile adoption than larger enterprises, which often struggle with the complexities of organizational structure and change management. The survey will assess how company size influences the ease and success of Agile transformations.

4. Do more traditional sectors, such as financial services (e.g., banks and insurance companies), benefit more from the adoption of Agile success factors during a Scaled Agile transformations?

This question examines whether traditional industries, which tend to be more resistant to change, rely more heavily on key Agile success factors such as leadership support and structured training compared to more innovative, tech-driven sectors. The survey will determine if these success factors play a critical role in overcoming the unique challenges faced by companies in heavily regulated industries.

3.2 Survey methodology

This research was conducted within the Agile Lab, a dedicated unit that is part of the Institute for Transformative Innovation Research (ITIR) at the University of Pavia. The Agile Lab focuses on exploring and advancing Agile principles and practices in various organizational settings, making it a fitting environment for this study [66].

The survey was structured following proven best practices and utilized the language and taxonomy of Agile to ensure relevance and clarity for respondents familiar with these methodologies. By adopting this approach, the survey aimed to capture accurate and insightful data that reflect the real experiences and perspectives of businesses undergoing Agile transformations.

The survey was published on Google Forms, allowing for an accessible and user-friendly platform for data collection. It was available from May to August 2024, providing ample time for a diverse range of participants to contribute. This extended collection period ensured a broad and representative sample, enhancing the comprehensiveness and validity of the findings.

3.2.1 Survey structure

The survey was meticulously structured to gather comprehensive and relevant data, ensuring a thorough understanding of the Agile transformation landscape. The survey was divided into several sections, each designed to capture specific aspects of the respondents' experiences and insights [67, 68].

3.2.1.1 User and company profiling

The first section of the survey focused on profiling the respondents to ensure that the data collected was both relevant and representative. This section included detailed questions designed to capture essential background information about the respondents and their organizations. The questions in this section included:

- **Company name:** To identify the respondent's organization, allowing for potential follow-up and further segmentation of data.
- **Industry:** To categorize the company within a specific sector, providing context for the responses and enabling industry-specific analysis.
- **Company size:** To understand the scale of the organization, particularly important for assessing the feasibility and challenges of Scaled Agile transformations. Respondents were asked to specify the number of employees.
- **Function:** To determine the department or functional area of the respondent within the company, helping to identify which functions are most involved in Agile transformations.
- **Role:** To capture the specific job title or position of the respondent, providing insights into the diversity of perspectives.
- **Years of experience:** To gauge the respondent's level of expertise and familiarity with the industry and Agile methodologies, categorized into ranges.
- **Role in Agile project/transformation:** To identify the respondent's involvement in Agile projects, ensuring that the data collected is from those with direct, relevant experience. This includes specifying their role in the Agile transformation process.

3.2.1.2 Agile adoption and organization

The second section of the survey delved into the specifics of Agile adoption within the respondents' organizations. This section aimed to understand the extent and nature of Agile practices being implemented. The questions in this section included:

- **Year of adoption of the first Agile project (pilot):** To determine when the company first began its Agile journey. This helps in understanding the duration of Agile practices within the organization and correlating it with the maturity of their Agile processes.
- **Primary area of Agile adoption:** To identify which parts of the organization have adopted Agile practices. This question helps to see if Agile is confined to certain departments like software

development or if it has spread to other areas such as human resources, marketing, sales, customer service, or operations.

- **Establishment of communities of practices (knowledge sharing groups across different Agile teams):** To understand if and how communities of practice have been established within the organization. This includes various groups like Scrum Masters, Developers, Architects, Testing & QA, and UX/UI Design, which facilitate knowledge sharing and continuous improvement.
- **Level of Agile adoption within the company:** to assess the depth of Agile adoption, whether at the project level (individual projects adopting Agile practices), program level (multiple related projects adopting Agile practices), or portfolio level (organization-wide strategic adoption across all projects and programs). This helps to gauge the overall integration of Agile methodologies within the company.
- **Agile frameworks adopted:** To identify the specific Agile frameworks being used within the organization. This includes frameworks such as Scrum, Kanban, Lean, Scrumban, Scrum of Scrum, Disciplined Agile Delivery (DaD), Nexus, Scaled Agile Framework (SAFe), and Large Scale Scrum (LeSS), providing insights into the preferred methodologies and their application.
- **Collaboration among Agile teams:** To evaluate the extent and nature of collaboration between different Agile teams within the organization. This question explores whether teams have no formal collaboration, engage in informal ad-hoc meetings, or hold regular scheduled meetings, indicating the level of coordination and communication among Agile teams.

3.2.1.3 Agile performance

The third section of the survey focused on evaluating the performance indicators related to Agile adoption. This section aimed to assess how key performance metrics have changed as a result of adopting Agile methodologies. The questions in this section included:

- **How these indicators changed in the early stage of the Agile adoption compared to the initial state:** To assess the immediate impact of Agile adoption on key performance indicators, providing insights into the initial benefits and challenges faced by the organization.
- **How these indicators changed after a stable Agile adoption compared to the initial state:** To evaluate the long-term effects of Agile adoption on performance metrics, highlighting sustained improvements or persistent issues after the organization has achieved a stable Agile practice.
- **Deployment frequency:** To measure how often new features, updates, or releases are deployed, reflecting the efficiency and responsiveness of the Agile process.
- **Percentage of defects detected:** To gauge the quality of the output by measuring the proportion of defects (such as bugs, errors, or misalignments) identified relative to the total functions released, indicating the effectiveness of Agile practices in improving product quality.

3.2.1.4 Impact of main challenges and success factors

The fourth and fifth sections of the survey focused on evaluating the impact of various challenges and success factors identified in the systematic literature review. Respondents were asked to rate the impact of each item on a scale of 1 to 5 (very low, low, medium, high, very high). This combined section aimed to understand the key obstacles and enablers in the Agile transformation process.

The challenges were grouped into the following categories:

- **Resistance to Change:** Assessing the extent to which resistance from employees and management affects Agile adoption.
- **Lack of Agile knowledge:** Evaluating the impact of insufficient understanding and expertise in Agile methodologies within the organization.
- **Transition Turbulence:** Measuring the difficulties encountered during the transition phase from traditional to Agile practices.
- **Multi-team environments:** Understanding the challenges of coordinating and managing multiple Agile teams.
- **Requirement management:** Assessing the impact of managing and prioritizing requirements in an Agile setting.

The success factors were grouped into the following categories:

- **Leadership support:** Assessing the importance of support and commitment from senior management in successful Agile adoption.
- **Training and coaching:** Evaluating the impact of providing adequate training and coaching to employees on Agile methodologies.
- **Smooth transition:** Measuring the effectiveness of strategies and practices that facilitate a smooth transition to Agile.
- **Team engagement:** Understanding the role of team involvement and motivation in the success of Agile practices.
- **Culture and communication:** Assessing the impact of organizational culture and communication practices on Agile adoption and performance.

After evaluating both challenges and success factors, respondents were given the opportunity to add additional challenges and success factors not covered in the literature review. This approach ensured that the survey captured all relevant obstacles and enablers faced during Agile transformations, providing a comprehensive understanding of the factors influencing Agile adoption and success.

3.2.2 Exclusion criteria

To ensure that the survey results accurately reflect the experiences and challenges of companies undergoing Agile transformations, specific exclusion criteria were carefully implemented. These criteria were designed to filter out respondents who do not meet the necessary conditions for providing relevant and insightful data for this research. The following groups were excluded:

- **Consulting companies:** Consulting firms were excluded from the survey because their primary focus is on transforming their clients rather than undergoing internal transformations. Including these companies could have skewed the results, as their insights would pertain more to external transformation processes rather than internal Agile adoption and scaling.
- **Companies with less than 50 employees:** Organizations with fewer than 50 employees were not included in the survey to ensure the potential for executing a Scaled Agile transformation. Smaller companies might not face the same challenges and dynamics as larger organizations when it comes to scaling Agile practices. Therefore, to capture insights relevant to larger-scale Agile transformations, this exclusion was necessary.

- Lack of active role in Agile projects:** The survey was designed to collect data from individuals who have an active role in Agile projects. This criterion ensured that the respondents could provide first-hand impressions and experiences, which are crucial for understanding the practical aspects of Agile transformations. Including only those with direct involvement in Agile projects helped in gathering detailed and accurate information about the challenges and success factors encountered.

3.3 Survey findings

The survey collected a total of 118 responses, providing a broad base of data for analysis. However, to ensure the accuracy and relevance of the findings, responses that did not meet specific criteria were excluded from the final dataset. After applying these exclusion criteria, 105 valid responses remained for analysis. This refined dataset allowed for a more focused and accurate examination of the trends and insights within the Agile adoption landscape. The data was meticulously analyzed using IBM SPSS 29, a robust statistical software tool that ensured the reliability and validity of the results.

3.3.1 Company profiling

The industry distribution within the sample reveals a diverse representation across multiple sectors, reflecting the wide-ranging applicability of Agile methodologies. Notably, the Telecommunications industry stands out as the most prevalent, encompassing 20% of the total respondents. This is closely followed by the Technology sector, which accounts for 13% of the participants, and the Banking sector, contributing 12% to the overall sample. Manufacturing and energy also hold a significant portion, representing 10% of the respondents. Furthermore, industries such as Healthcare, Media, and Insurance each account for 8% to 7% of the sample, underscoring their relevance in the context of Agile adoption. Although smaller in proportion, industries like Utilities, Food & Beverage, and Automotive are not insignificant, with their contributions ranging from 1% to 4%, demonstrating the widespread reach of Agile practices (Figure 10).

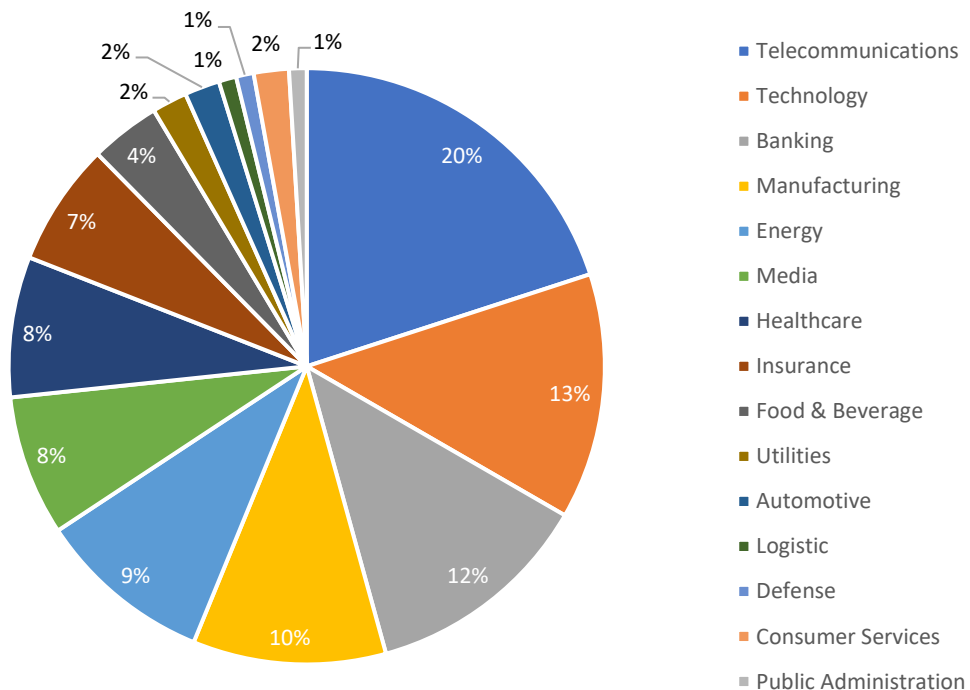


Figure 10 - Distribution of respondents by industry

When the data is analyzed by sector, a clear concentration is observed within the Telco-Media-Tech (TMT) sector, which dominates the sample with 41% representation. This substantial figure highlights the sector's leading role in driving Agile transformation. The Financial Services sector follows, comprising 19% of the sample, reflecting its growing engagement with Agile methodologies. The Energy and Utilities sectors together account for 12% of the respondents, while the Industrial sector contributes 13%. The remaining 15% of the sample is distributed across various other sectors, further emphasizing the broad adoption of Agile across different industry landscapes (Figure 11).

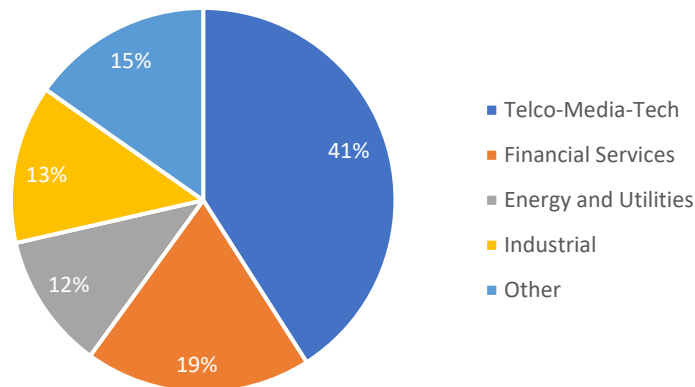


Figure 11 - Distribution of respondents by sector

The survey data highlights a notable concentration of responses from larger organizations, with a substantial 70% of respondents representing companies that employ more than 10000 people. Mid-sized companies, with workforces ranging between 5001 and 10000 employees, make up 10% of the sample, while those with 1001 to 5000 employees contribute an additional 12%. The survey also includes smaller organizations, with 5% of respondents coming from companies with 501 to 1000 employees, and 3% representing firms with 251 to 500 employees. This distribution reflects the varying scales at which Agile practices are being implemented, from large enterprises to smaller, more Agile organizations (Figure 12).

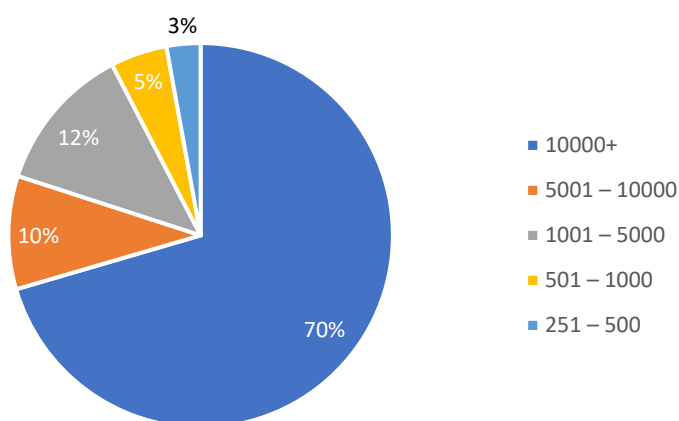


Figure 12 - Distribution of respondents by company size

3.3.2 User profiling

The survey's user profiling provides a detailed view of the respondents' professional backgrounds, offering insights into their roles, experience, and involvement in Agile projects. This demographic analysis is crucial in understanding the perspectives and experiences that shape the survey's findings.

A significant portion of the respondents, 64%, belong to the Information Technology function, underscoring the central role of IT professionals in Agile transformations (Figure 13). Sales and Marketing follow at a distant 12%, reflecting their growing engagement in Agile practices. Other functions such as Operations, Finance, and Customer Service are less represented, each contributing between 1% and 5% of the sample. This distribution suggests that Agile methodologies are driven by IT but also highlight its expanding influence in other business areas.

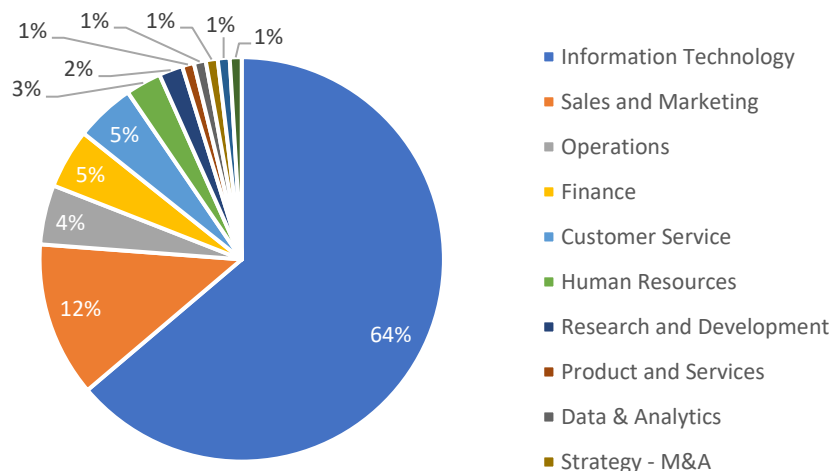


Figure 13 - Distribution of respondents by function

In terms of organizational roles (i.e., level of seniority), most of the respondents occupy Senior Management positions, accounting for 34% of the sample. Directors and Vice Presidents also play significant roles in Agile adoption, representing 22% and 16% of the sample, respectively. Middle Management and C-Level executives, including CEOs, CFOs, CTOs, and CIOs, contribute an additional 12% each, highlighting the diverse leadership engagement in Agile projects. Team Leaders and Project Managers, while fewer in number, are still essential, representing 4% of the respondents (Figure 14). This profile indicates a strong leadership involvement in Agile practices, which is critical for successful transformation initiatives.

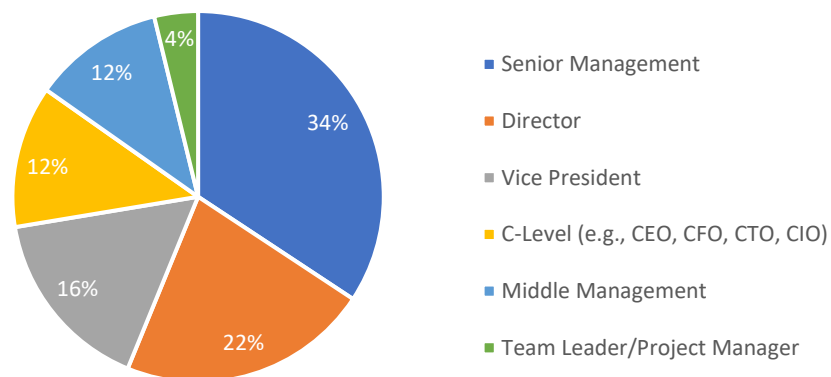


Figure 14 - Distribution of respondents by organizational role

When analyzing the respondents' experience, the data reveals that a substantial 68% have more than 15 years of professional experience, indicating that seasoned professionals are leading Agile initiatives (Figure 15). Those with 13 to 15 years of experience make up 18% of the sample, while 10 to 12 years of experience accounts for 8%. The presence of less experienced professionals, with 7 to 9 years and 1 to 3 years of experience, is minimal, at 5% and 1% respectively.

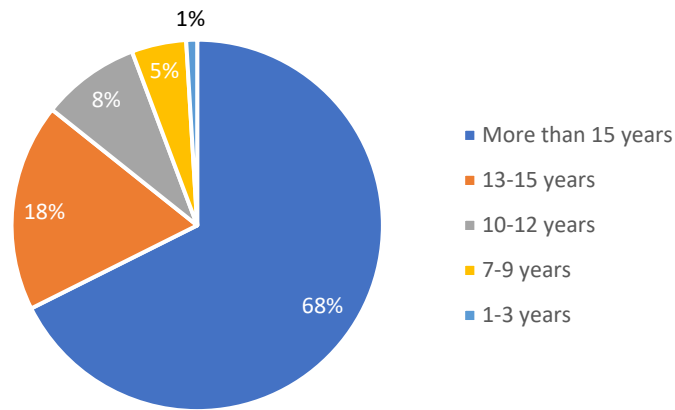


Figure 15 - Distribution of respondents by years of experience

Regarding the role in Agile projects, most of the respondents serve as Senior Stakeholders, making up 36% of the sample (Figure 16). Sponsors of Agile projects follow, representing 30%, indicating strong executive support for Agile transformations. Agile Coaches and Product Owners, critical roles in implementing and guiding Agile practices, account for 20% and 7% of the respondents, respectively. Meanwhile, Agile Team Members and Scrum Masters/Kanban Leads represent smaller portions of the sample, 5% and 1% respectively, reflecting their more specialized roles within Agile teams.

The full representation of individuals directly involved in Agile projects further underscores the focused and experienced nature of the survey respondents.

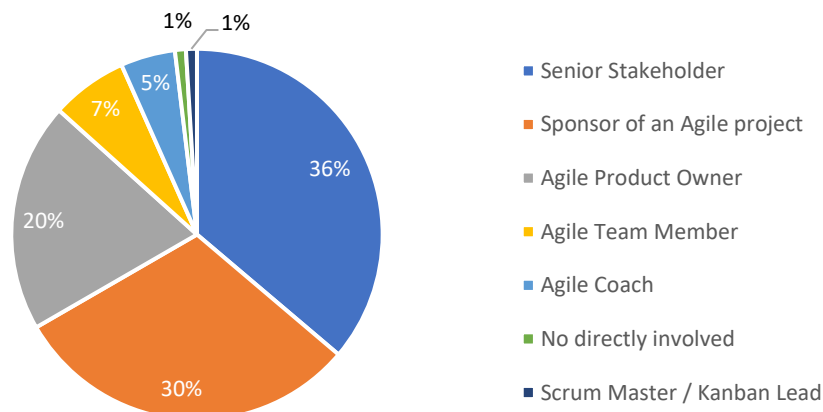


Figure 16 - Distribution of respondents by role in Agile projects

3.3.3 Agile adoption view

The survey data provides a detailed overview of the respondents' experiences with Agile adoption, highlighting the evolution and current state of Agile practices within their organizations.

Most of the respondents, 80%, reported that their organizations initiated their first Agile project between 2017 and 2019 (Figure 17). This period marks a significant phase of Agile adoption, indicating a widespread shift towards Agile methodologies during these years. Earlier adoption periods, such as 2011 to 2013, are much less represented, with only 1% of respondents, while 7% started adopting Agile between 2014 and 2016. More recent adoption, between 2020 and 2022, is represented by 10% of respondents, and only 2% have begun their Agile journey from 2023 to the present.

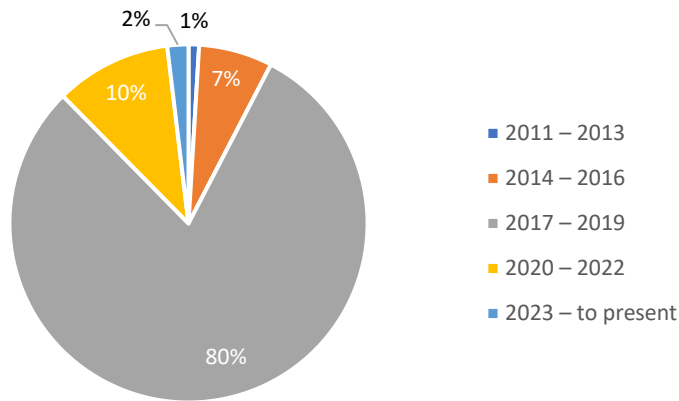


Figure 17 - Distribution of respondents by year of implementation of the first Agile project

When examining the primary areas of Agile adoption, Software Development overwhelmingly dominates, with 88% of respondents indicating this as the primary focus (Figure 18). Other areas such as Operations, Marketing, Data & Analytics teams, Sales, Agile at scale across the entire organization, Virtual Infrastructure Build, and Product Management account for much smaller portions of the sample, each ranging from 1% to 4%. This distribution highlights the strong association between Agile practices and software development, though it also suggests that other business functions are starting to explore Agile methodologies, albeit on a much smaller scale.

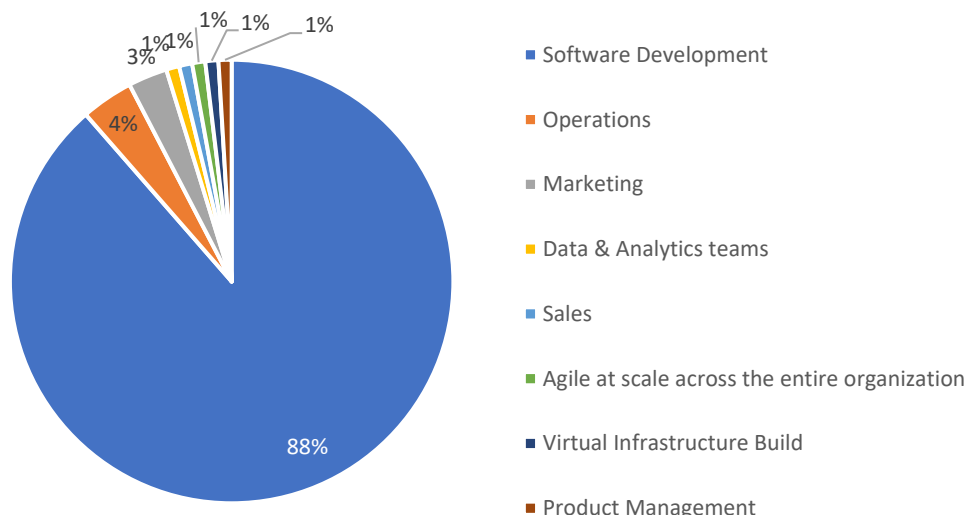


Figure 18 - Distribution of respondents by primary area of Agile adoption

The level of Agile adoption within companies varies significantly, reflecting different degrees of maturity and scalability in implementing Agile practices (Figure 19). Most of the respondents, 72%, report Agile adoption at the Program Level, indicating that multiple related projects within their organizations are adopting Agile

practices in a coordinated manner. This reflects a growing maturity in Agile practices, moving beyond individual projects to more integrated, multi-project initiatives. Additionally, 22% of respondents report adoption at the Portfolio Level, which represents the highest level of maturity and scalability, where Agile practices are strategically adopted across all projects and programs within specific areas. The remaining 6% of respondents indicate that Agile practices are still confined to individual projects, reflecting the early stages of Agile adoption.

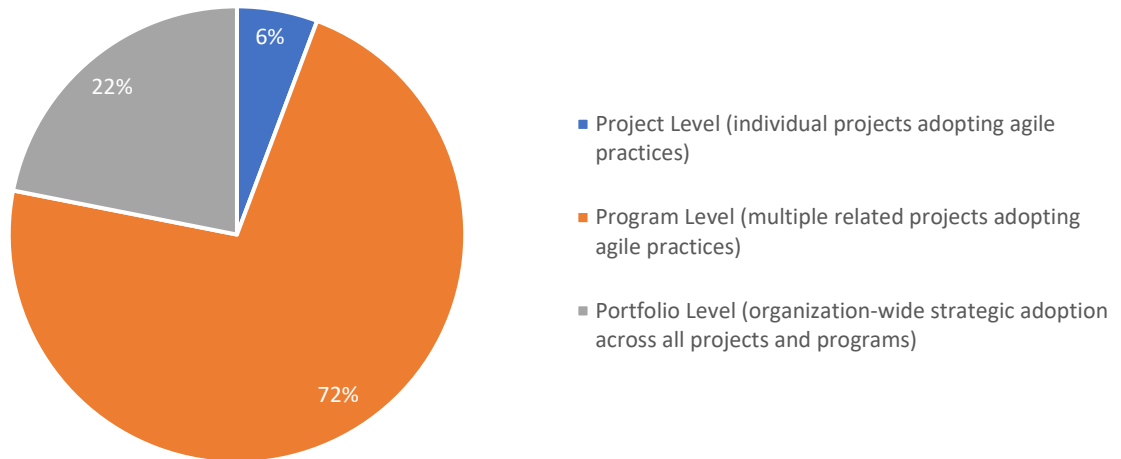


Figure 19 - Distribution of respondents by level of Agile adoption

Collaboration among Agile teams is a critical factor in the success of Agile adoption, and the survey data shows that most of the respondents, 93%, engage in regular scheduled meetings to facilitate this collaboration (Figure 20). This structured approach to communication ensures that teams remain aligned and can effectively coordinate their efforts. A smaller proportion, 5%, rely on informal ad-hoc meetings, which may indicate a more flexible or less formalized approach to collaboration. Only 2% of respondents report no formal collaboration, underscoring the importance of consistent communication and coordination in achieving Agile success.

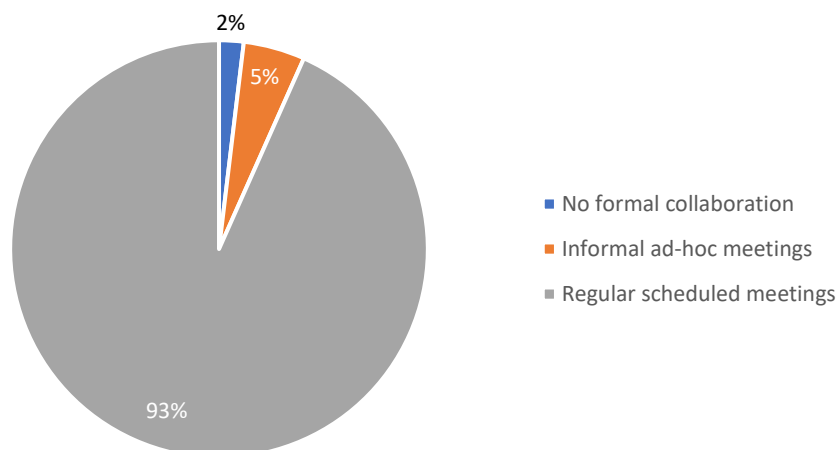


Figure 20 - Distribution of respondents by level of collaboration among Agile teams

3.3.4 Qualitative KPIs

The survey data provides a comprehensive look at six key qualitative performance indicators (KPIs) in relation to Agile adoption. By comparing the impact of Agile practices at the early stage of adoption to their effects after a stable adoption phase, we can observe significant changes in team productivity, customer satisfaction, employee satisfaction, delivery time, response to change, and quality of deliverables.

Team productivity

In the early stage of Agile adoption, 55% of respondents reported a slight increase in team productivity, while 23% noted a significant increase. However, 11% still experienced a slight decrease, and 10% saw no change. After the transition to stable Agile adoption, the results shifted dramatically, with 81% of respondents reporting a significant increase in productivity and 16% noting a slight increase. The number of respondents who experienced any decrease in productivity dropped to 1%, indicating that sustained Agile practices lead to substantial improvements in team efficiency (Figure 21).

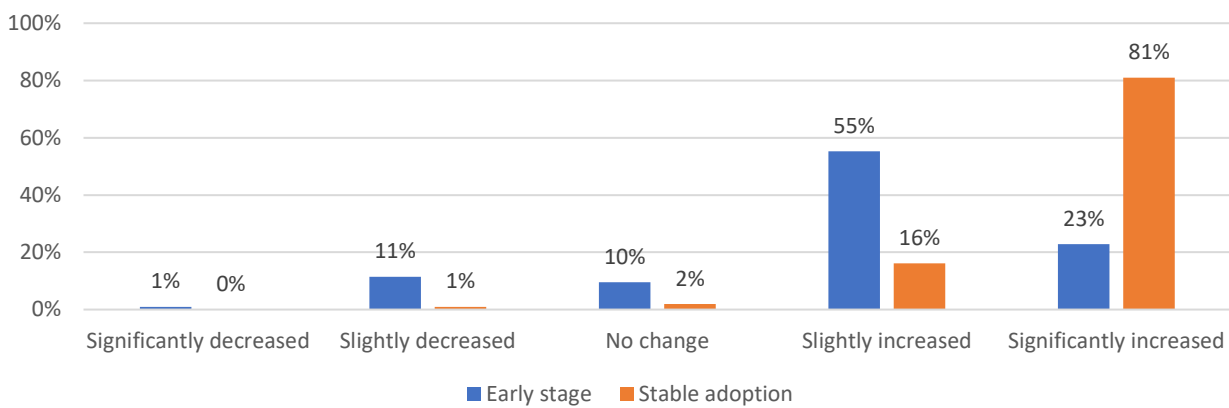


Figure 21 - Team productivity at the early stage and after a stable Agile adoption

Customers satisfaction

At the early stage of Agile adoption, 66% of respondents observed a slight increase in customers satisfaction, while 6% reported a significant increase. However, 24% noticed no change, and a small percentage (5%) experienced a decrease in satisfaction. With stable Agile adoption, the percentage of respondents reporting a significant increase in customers satisfaction jumped to 55%, with an additional 41% noting a slight increase. The data clearly suggests that as Agile practices become more ingrained, customer satisfaction improves significantly (Figure 22).

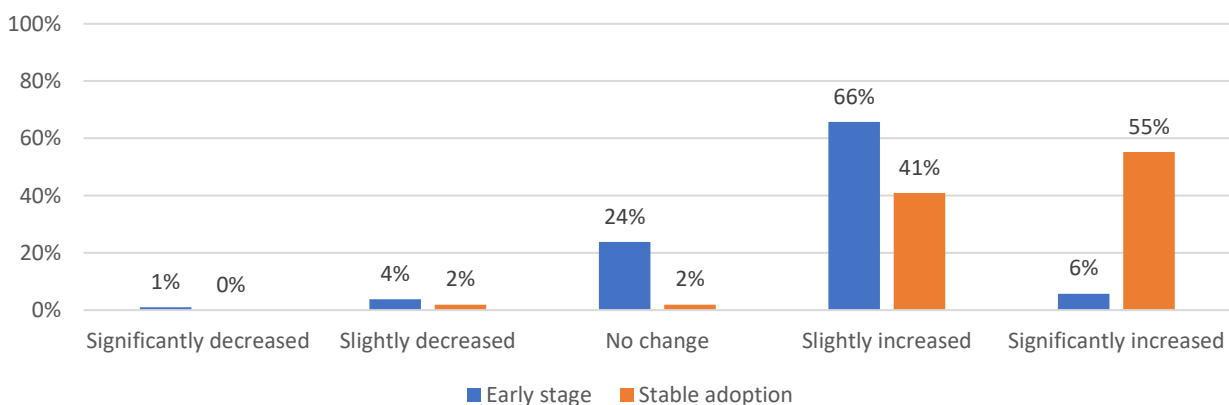


Figure 22 - Customer satisfaction at the early stage and after a stable Agile adoption

Employees satisfaction

Employees satisfaction showed notable improvements during both the early and stable stages of Agile adoption. Initially, 70% of respondents reported a slight increase in satisfaction, with 2% noting a significant increase. Interestingly, 15% reported no change, and 13% saw a slight decrease. In the stable adoption phase, the percentage of respondents who experienced a significant increase in satisfaction rose to 42%, and those reporting a slight increase remained high at 51%. The overall trend indicates that while initial challenges may exist, long-term Agile adoption positively impacts employees satisfaction (Figure 23).

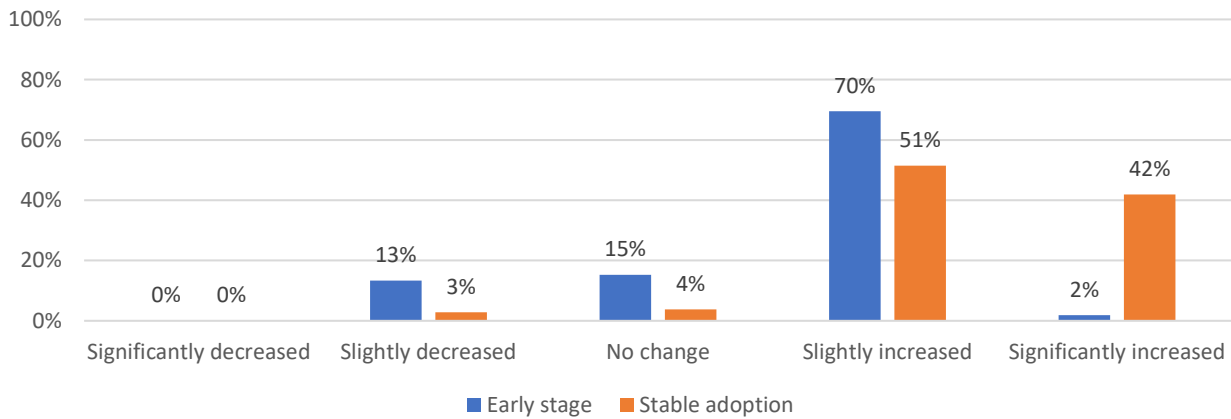


Figure 23 - Employees satisfaction at the early stage and after a stable Agile adoption

Delivery time

In the early stage of Agile adoption, 50% of respondents saw a slight improvement in delivery time, with 40% reporting a significant improvement. A small percentage (11%) experienced no change or a slight decrease in delivery time. After achieving stable Agile adoption, the number of respondents reporting significant improvements in delivery time increased to 83%, with 13% noting a slight increase. This significant shift suggests that the efficiency gains from Agile practices become more pronounced over time (Figure 24).

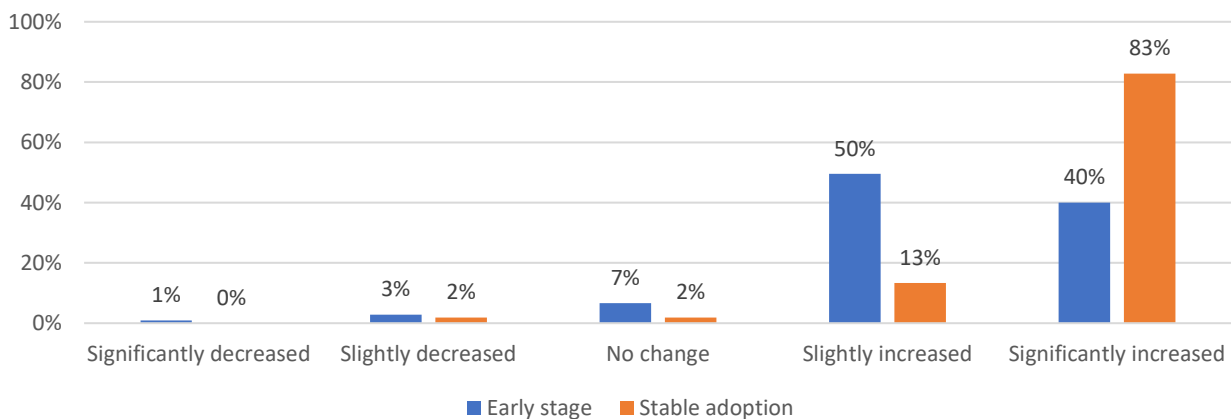


Figure 24 - Delivery time at the early stage and after a stable Agile adoption

Response to change

During the early stage of Agile adoption, 40% of respondents reported a slight improvement in their organization's ability to respond to change, while 55% observed a significant improvement. Only a small fraction (5%) saw no change or a decrease. In the stable adoption phase, the percentage of respondents reporting a significant improvement in response to change rose sharply to 90%, with just 6% noting a slight

increase. This highlights the enhanced agility and adaptability that stable Agile practices can bring to an organization (Figure 25).

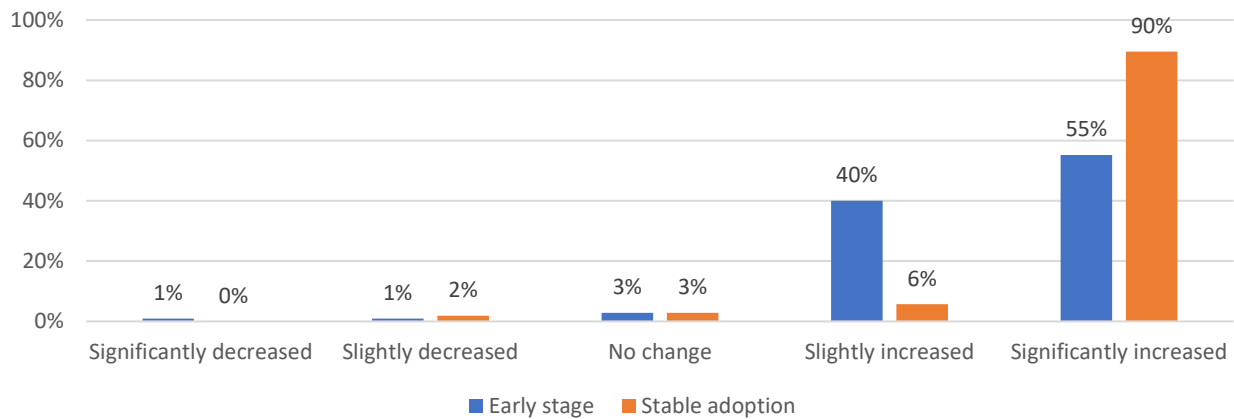


Figure 25 - Response to change at the early stage and after a stable Agile adoption

Quality of deliverables

The quality of deliverables saw a steady improvement throughout the Agile adoption process. Initially, 40% of respondents reported a slight increase in quality, with 45% noting a significant increase. However, 12% experienced no change, and 3% saw a slight decrease. In the stable adoption phase, the percentage of respondents reporting a significant increase in quality rose to 83%, with 11% observing a slight increase. The data suggests that Agile practices have a strong, positive impact on the quality of work produced as they become more established within an organization (Figure 26).

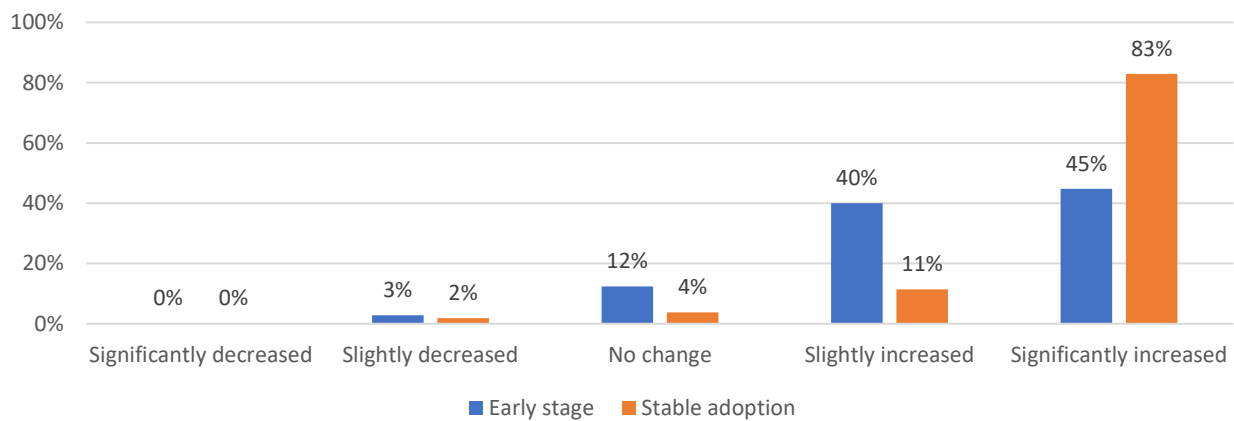


Figure 26 - Quality of deliverables at the early stage and after a stable Agile adoption

Across all six KPIs, the transition from early to stable Agile adoption is associated with significant improvements in performance, satisfaction, and efficiency, reinforcing the long-term value of adopting Agile methodologies in a sustained and committed manner.

3.2.5 Quantitative KPIs

The survey data provides insights into two key quantitative performance indicators (KPIs): deployment frequency and percentage of defects detected. These KPIs are critical in understanding the tangible benefits

and improvements associated with Agile practices as organizations progress from pre-adoption to early stages and eventually achieve stable Agile adoption.

Deployment frequency

Before Agile adoption, most of the respondents (73%) reported deploying on a quarterly basis, with 24% deploying monthly, and very few deploying more frequently. As Agile practices were introduced, there was a significant shift in deployment frequency during the early stage of adoption. By this stage, 78% of respondents had moved to a monthly deployment cycle, and 19% were deploying bi-weekly. Weekly deployments were still relatively uncommon, with only 3% of respondents reporting this frequency (Figure 27).

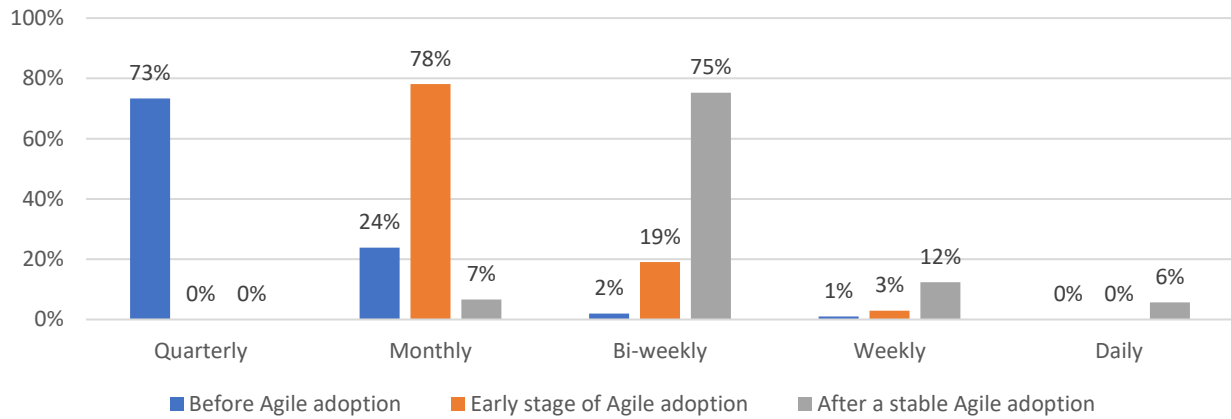


Figure 27 - Deployment frequency across the different phases of the Agile transformation

After achieving stable Agile adoption, the deployment frequency further increased, reflecting the hallmark of Agile methodologies: frequent and continuous delivery. At this stage, 75% of respondents reported bi-weekly deployments, 12% weekly, and 6% daily. The percentage of respondents who continued to deploy monthly dropped significantly to 7%. This shift underscores the effectiveness of Agile practices in enabling more frequent and reliable deployments, which is crucial for maintaining a competitive edge and responding swiftly to market demands.

Percentage of defects detected

The percentage of defects detected is another crucial KPI that reflects the quality improvements achieved through Agile practices. Before adopting Agile, 50% of respondents reported detecting 5-10% of defects, while 38% detected less than 5% of defects, indicating a relatively lower defect detection rate. A small portion, 8%, reported detecting more than 20% of defects, suggesting potential quality issues before Agile implementation.

During the early stage of Agile adoption, there was an improvement, with 62% of respondents reporting a defect detection rate of less than 5%, and 32% detecting 5-10% of defects. The number of respondents detecting more than 20% of defects dropped to 2%, reflecting early quality improvements through Agile practices.

After achieving stable Agile adoption, the quality of deliverables improved further. An impressive 91% of respondents reported detecting less than 5% of defects, indicating a significant reduction in defects and an overall improvement in product quality. Only 6% reported detecting 5-10% of defects, and the percentage of those detecting more than 20% of defects dropped to a mere 1%. This data clearly demonstrates that as organizations mature in their Agile practices, the quality of their outputs improves markedly, leading to fewer defects and higher customer satisfaction (Figure 28).

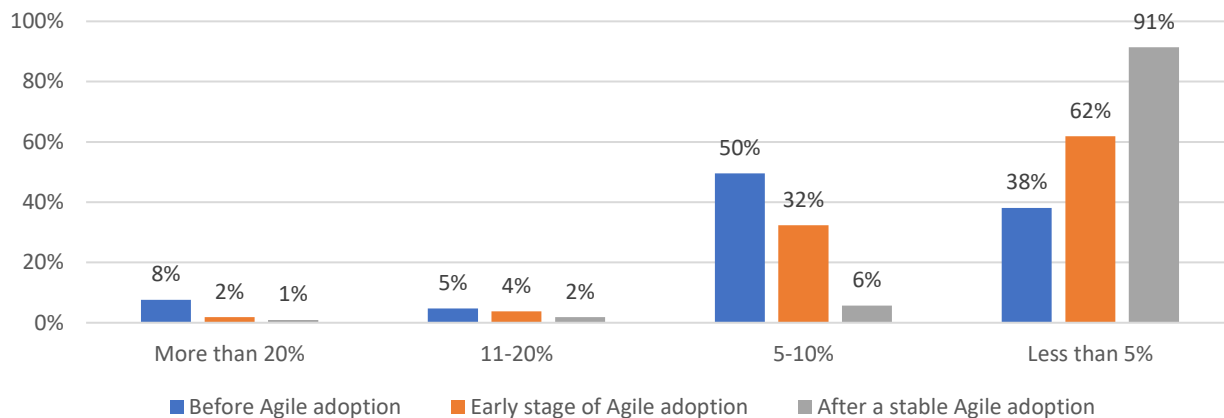


Figure 28 - Percentage of defects detected across the different phases of the Agile transformation

The progression from pre-adoption to stable Agile adoption is marked by significant improvements in both deployment frequency and defect detection rates. Agile methodologies not only enable faster and more frequent deployments but also contribute to substantial enhancements in the quality of deliverables, as evidenced by the reduction in defect rates.

3.2.6 Agile adoption challenges

The survey analyzed the five major categories of challenges faced by organizations during Agile adoption, as identified by the systematic literature review. These categories represent a comprehensive framework for understanding the multifaceted difficulties that can emerge throughout the Agile transformation process. Each category encapsulates a range of specific obstacles, from cultural resistance and knowledge gaps to logistical hurdles and structural inconsistencies, which collectively can hinder the successful implementation and scaling of Agile methodologies.

Resistance to the introduction of Agile methodologies

Resistance to change is a common barrier in the adoption of new methodologies, and Agile is not an exception. The data shows that the most significant resistance comes from "Established routines on Agile adoption," with 56% of respondents rating this challenge as high and 18% as medium. This suggests that ingrained processes and the reluctance to deviate from established ways of working can be significant hurdles in the early stages of Agile adoption (Figure 29).

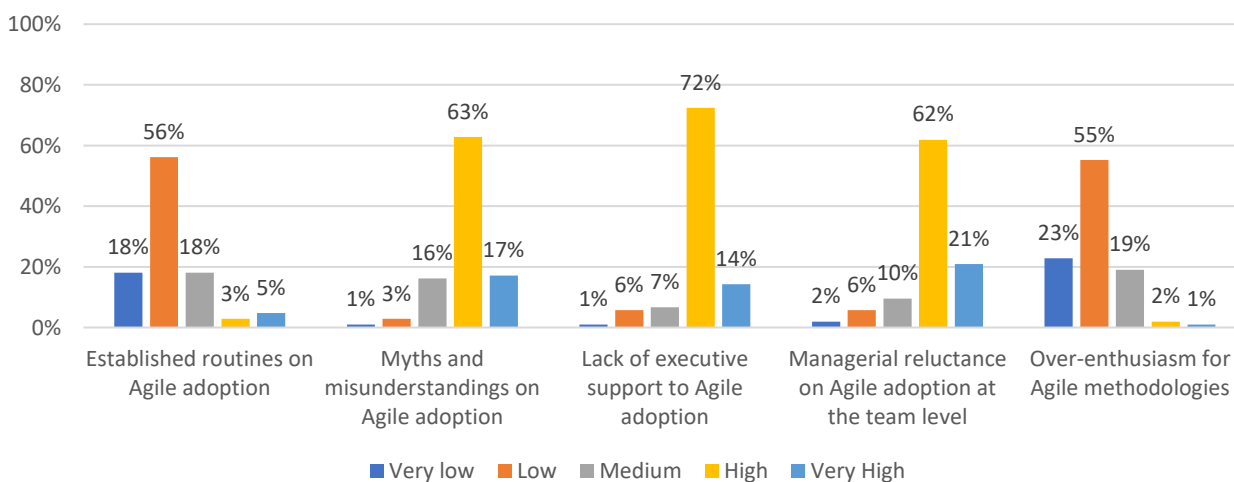


Figure 29 - Challenge 1 analysis - Resistance to the introduction of Agile methodologies

Another major resistance factor is "Myths and misunderstandings on Agile adoption," which 63% of respondents rated as high. This highlights the need for proper education and clear communication about what Agile truly entails. Additionally, "Lack of executive support to Agile adoption" and "Managerial reluctance on Agile adoption at the team level" are rated as very high by 72% and 62% of respondents, respectively, indicating that leadership buy-in and support are crucial for overcoming resistance. "Over-enthusiasm for Agile methodologies" also presents a challenge, with 55% rating it as high, suggesting that unrealistic expectations or overly aggressive adoption without proper planning can lead to difficulties.

Lack of Agile knowledge

A significant obstacle to successful Agile adoption is the lack of knowledge about Agile practices. The most critical issue here is "Training and coaching deficits in Agile adoption," which 70% of respondents rated as high and 21% as very high (Figure 30).

This reflects the necessity of adequate training and guidance to ensure that Agile principles are correctly understood and applied.

Another important challenge is "Inconsistent understanding of Agile concepts across teams," where 53% of respondents rated it as very high. This inconsistency can lead to misalignment and fragmented implementations. "Unclear managerial roles adaptation to Agile" also poses a significant challenge, with 57% of respondents rating it as high, suggesting that managers may struggle to redefine their roles in an Agile environment.

Lastly, "Partial or inaccurate Agile adoption on transformation effectiveness" was highlighted as very high by 58% of respondents, indicating that incomplete or incorrect adoption of Agile can severely impact its effectiveness.

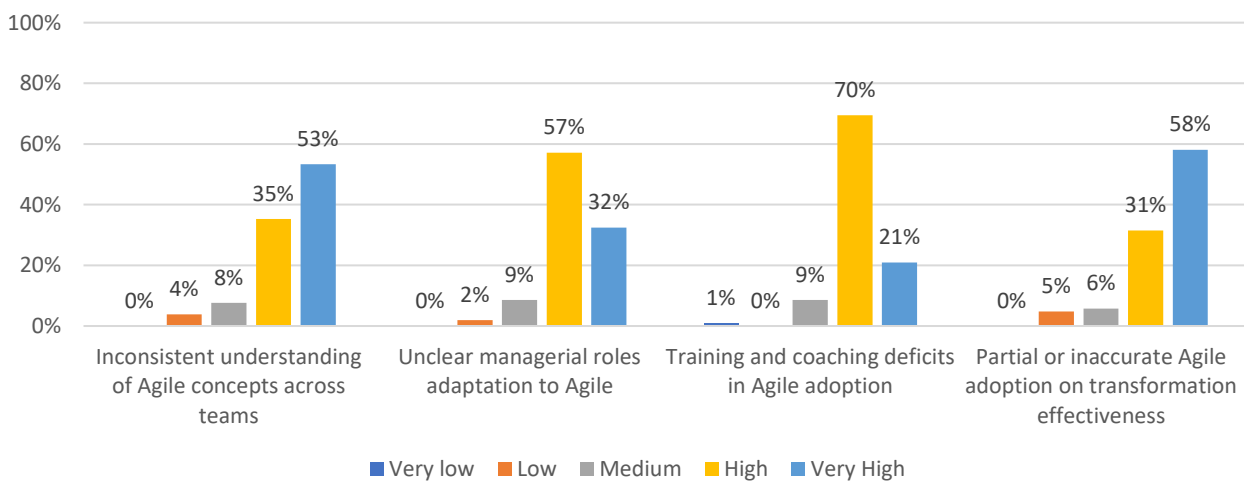


Figure 30 - Challenge 2 analysis - Lack of Agile knowledge

Transition turbulence

The transition from traditional methodologies to Agile practices often involves significant turbulence. "Sticking to waterfall practices during Agile adoption" is a major challenge, with 79% of respondents rating it as very high. This resistance to fully embrace Agile practices can undermine the entire transformation process (Figure 31). "Not adjusting workloads for Agile transformation" is another critical issue, with 43% rating it as high and 38% as very high, indicating that the failure to recalibrate workloads can lead to overburdened teams and inefficiencies.

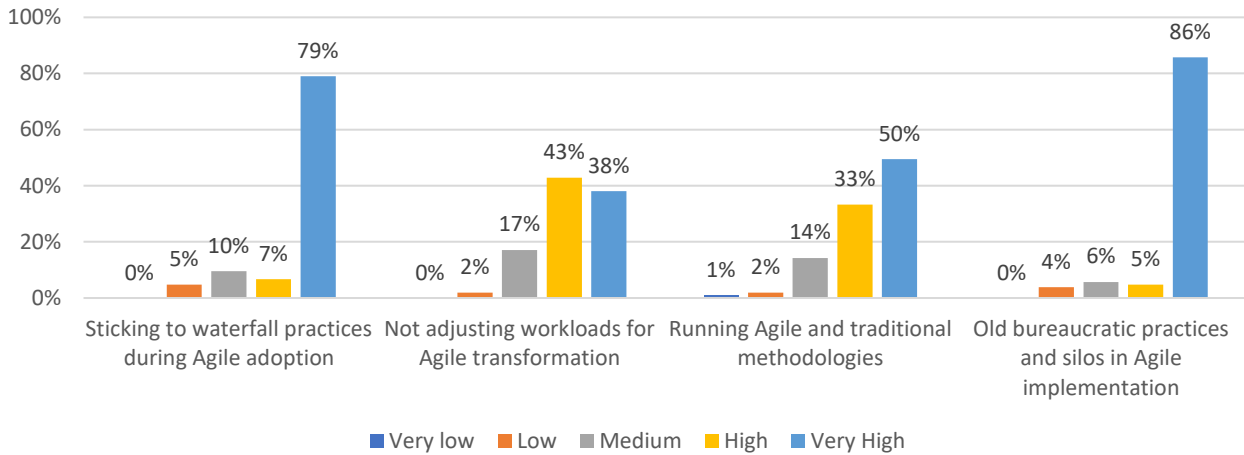


Figure 31 - Challenge 3 analysis - Transition turbulence

Additionally, "Running Agile and traditional methodologies concurrently" presents a challenge, with 50% of respondents rating it as very high, reflecting the difficulties of managing dual-track processes. The most significant challenge in this category is "Old bureaucratic practices and silos in Agile implementation," rated as very high by 86% of respondents, highlighting the deep-seated organizational barriers that can obstruct Agile adoption.

Multi-team environments

In environments where multiple Agile teams operate, coordination and alignment can be challenging. "Unstructured coordination between multiple Agile teams" is a significant issue, with 52% of respondents rating it as high and 36% as medium. This underscores the need for structured communication and collaboration mechanisms to ensure coherence across teams. "High team autonomy conflicting with organizational objectives" is another major challenge, rated as medium or high by 61% of respondents. While team autonomy is a key principle of Agile, it must be balanced with broader organizational goals. "HR reward structures unaligned with individual performance on Agile adoption" is also problematic, with 56% of respondents rating it as high, indicating that traditional HR practices may not support the collaborative and iterative nature of Agile. "Scaling Agile across geographically distributed locations" is a notable challenge, with 60% of respondents rating it as high, reflecting the complexities of implementing Agile in a dispersed environment (Figure 32).

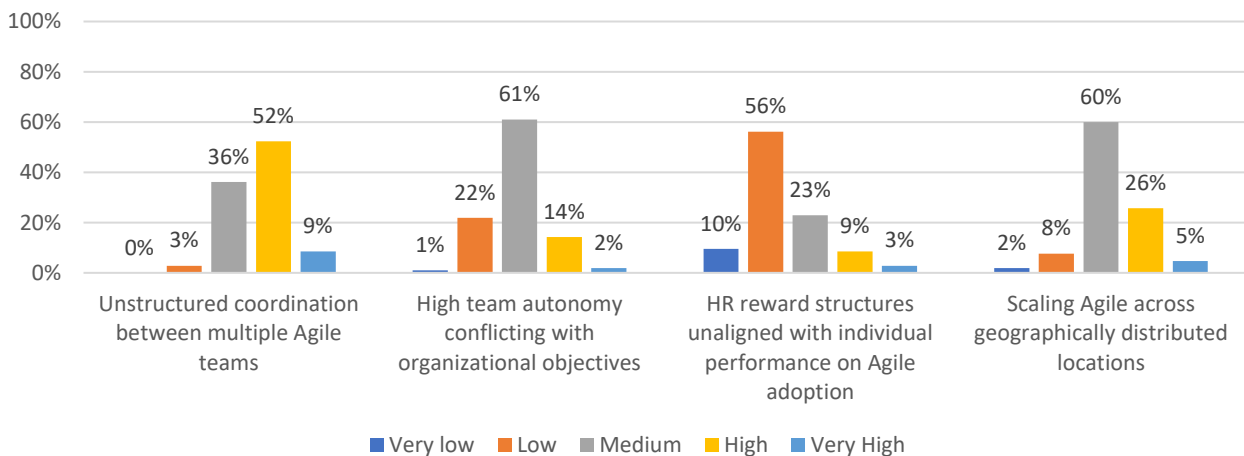


Figure 32 - Challenge 4 analysis - Multi-team environments

Requirement and progress management

Managing requirements and tracking progress in an Agile environment presents several challenges. "Managing high-level requirements in large Agile projects" is particularly difficult, with 72% of respondents rating it as high. This suggests that breaking down complex requirements into manageable tasks can be a significant obstacle (Figure 33).

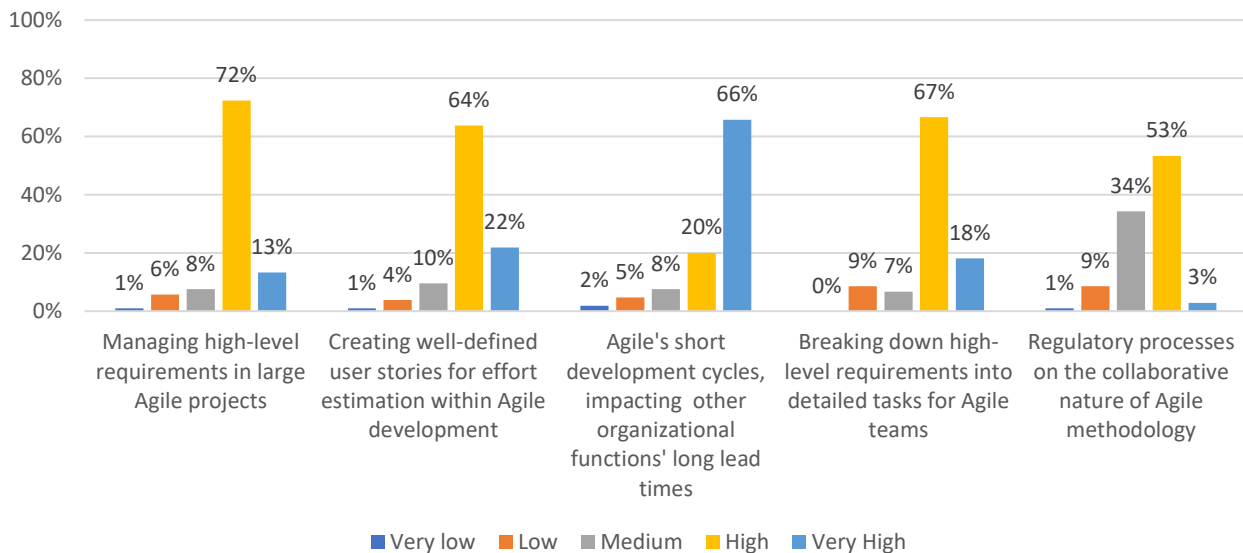


Figure 33 - Challenge 5 analysis - Requirement and progress management

"Creating well-defined user stories for effort estimation within Agile development" is another challenge, with 64% of respondents rating it as high. Properly scoped user stories are essential for accurate planning and resource allocation. "Agile's short development cycles impacting other organizational functions' long lead times" was highlighted as very high by 66% of respondents, indicating that Agile's rapid iterations can clash with longer, more rigid processes in other parts of the organization. "Breaking down high-level requirements into detailed tasks for Agile teams" and "Regulatory processes on the collaborative nature of Agile methodology" were both rated as high by 67% and 53% of respondents, respectively, reflecting the challenges of maintaining compliance while embracing Agile's collaborative ethos.

Ranking of the most relevant challenges in Agile adoption

These challenges have been prioritized based on the severity indicated by the percentage of respondents who rated them as "very high." The following section provides an in-depth analysis of the most significant obstacles encountered during Agile adoption, organized by their level of impact on the process.

- 1. Old bureaucratic practices and silos in Agile implementation (86% very high):** The most significant challenge, with 86% of respondents rating it as "very high," is the persistence of old bureaucratic practices and silos within organizations. These entrenched structures and departmental divides are major obstacles to Agile adoption, as they clash with the cross-functional, collaborative nature of Agile methodologies.
- 2. Sticking to waterfall practices during Agile adoption (79% very high):** Another critical challenge is the tendency to revert to waterfall practices, even as organizations attempt to adopt Agile methodologies. With 79% of respondents indicating this as a "very high" challenge, it underscores the difficulty of moving away from familiar, linear processes and fully committing to Agile practices.

3. **Managing high-level requirements in large Agile projects (72% very high):** Managing complex, high-level requirements in large Agile projects is another significant challenge. With 72% of respondents rating it as "very high," this issue highlights the difficulties organizations face in breaking down large-scale tasks into manageable components while maintaining overall project coherence and alignment.
4. **Training and coaching deficits in Agile adoption (70% very high):** Training and coaching deficits are a major challenge in Agile adoption, with 70% of respondents rating it as "very high." Adequate training is essential for ensuring that teams understand and correctly implement Agile practices. Without sufficient guidance, the risk of misapplication and failure increases significantly.
5. **Partial or inaccurate Agile adoption on transformation effectiveness (58% very high):** Another notable challenge is the issue of partial or inaccurate Agile adoption, which 58% of respondents rated as "very high." This challenge reflects the problems that arise when Agile methodologies are not fully or correctly implemented, leading to ineffective transformations that fail to deliver the expected benefits.

3.3.7 Agile adoption success factors

The survey analyzed the five major categories of success factors identified by the systematic literature review and implemented by organizations during Agile adoption. The survey data identifies several key success factors that play a crucial role in the successful implementation and sustainability of Agile methodologies within organizations. Each category presents specific enablers that significantly contribute to overcoming challenges and achieving a smooth Agile transformation. Below is a detailed analysis of each success factor, followed by a ranking of the most impactful enablers identified.

Leadership support

Leadership support is a cornerstone of successful Agile adoption, with several specific factors identified within this category. The most critical is "Unbiased change leaders to an objective and effective Agile transformation," with 71% of respondents rating it as very high. This highlights the importance of having leaders who are committed to the Agile process without personal biases that could influence the transformation's direction.

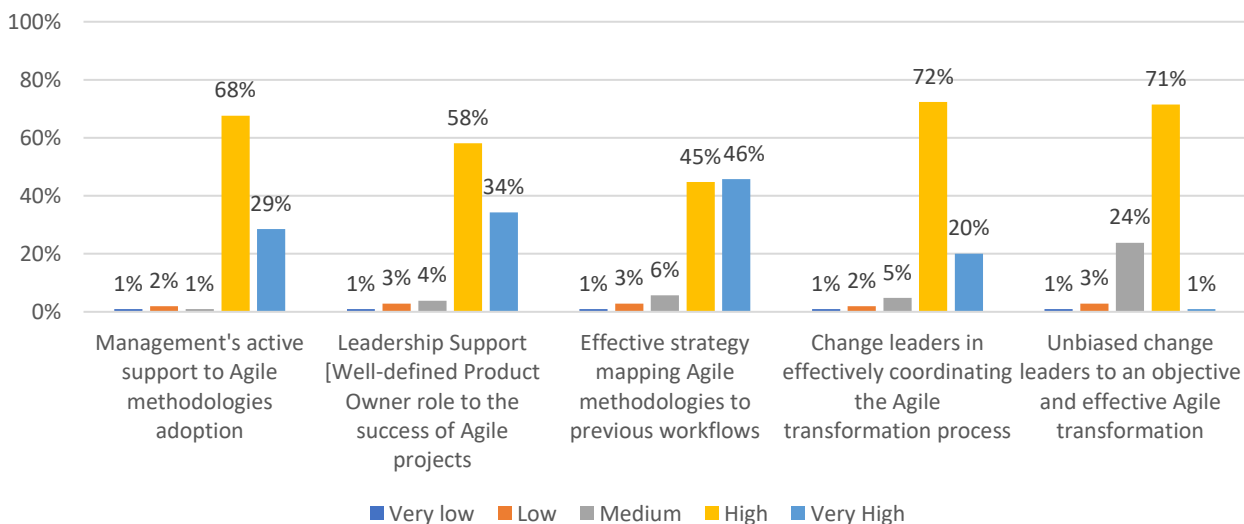


Figure 34 - Success factor 1 analysis - Leadership support

"Management's active support to Agile methodologies adoption" is another key factor, with 68% rating it as very high. Active engagement from management ensures that Agile practices are prioritized and adequately supported throughout the organization. "Change leaders in effectively coordinating the Agile transformation process" is also crucial, with 72% of respondents rating it as very high, indicating that skilled leadership is essential for navigating the complexities of Agile transformation (Figure 34).

Furthermore, "Support for a well-defined Product Owner role in the success of Agile projects" was rated as very high by 58% of respondents, emphasizing the critical role of the Product Owner in guiding Agile projects. Finally, "Effective strategy mapping of Agile methodologies to previous workflows" was considered very high by 46% of respondents, demonstrating the importance of aligning new Agile practices with existing organizational processes.

Training and coaching

Effective training and coaching are essential for a successful Agile transformation. The most significant factor in this category is "Specialized training for Product Owners to the successful application of Agile," with 74% of respondents rating it as very high. This reflects the need for targeted training to ensure that Product Owners are well-equipped to lead Agile initiatives effectively (Figure 35).

"Agile coaching to the improvement of Agile methodologies application" is another critical factor, rated as very high by 70% of respondents. Ongoing coaching helps teams refine their Agile practices and overcome challenges as they arise. "Customizing Agile practices to meet the organization's needs for successful adoption" was rated very high by 82% of respondents, indicating that tailoring Agile methodologies to fit specific organizational contexts is key to their success.

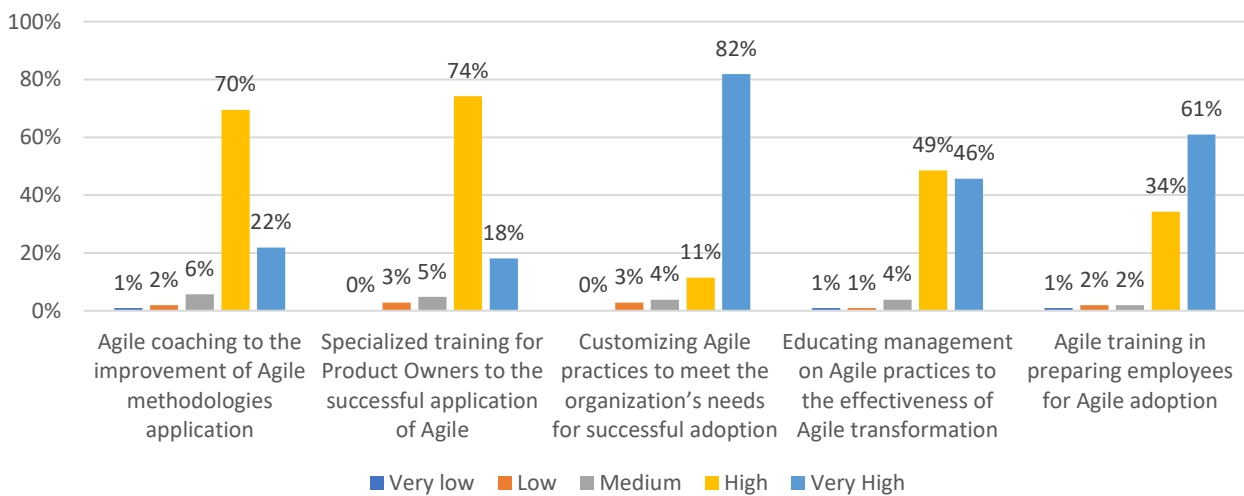


Figure 35 - Success factor 2 analysis - Training and coaching

"Educating management on Agile practices to the effectiveness of Agile transformation" was rated very high by 46% of respondents, highlighting the need for management to be well-versed in Agile principles to provide effective support. Finally, "Agile training in preparing employees for Agile adoption" received a very high rating from 61% of respondents, underlining the importance of comprehensive training programs that prepare all levels of the organization for the transition.

Clear and smooth transition

Ensuring a clear and smooth transition to Agile is critical for sustaining momentum and achieving long-term success. The most impactful factor in this category is "Pilot implementations of Agile to build credibility and

acceptance for broader adoption," rated very high by 72% of respondents. Pilot projects allow organizations to demonstrate Agile's benefits on a smaller scale before expanding its use across the organization (Figure 36).

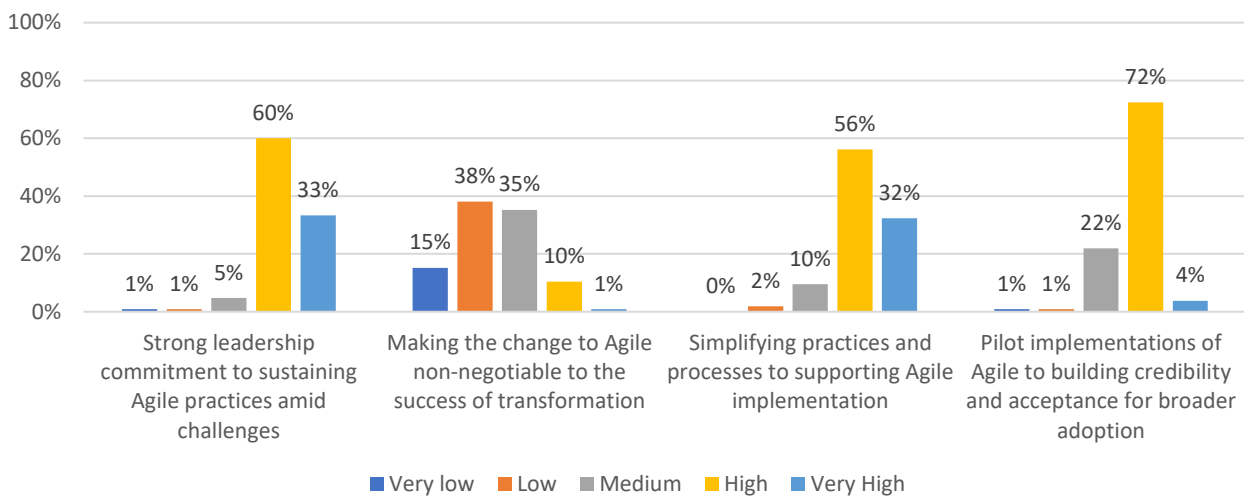


Figure 36 - Success factor 3 analysis - Clear and smooth transition

"Simplifying practices and processes to support Agile implementation" was rated very high by 56% of respondents, emphasizing the need to streamline procedures to align with Agile's iterative nature. "Strong leadership commitment to sustaining Agile practices amid challenges" received a very high rating from 60% of respondents, reflecting the importance of consistent leadership support throughout the transformation.

"Making the change to Agile non-negotiable to the success of transformation" was rated as very high by 35% of respondents, indicating that a firm commitment to Agile is necessary to overcome resistance and achieve full adoption. Lastly, "Pilot implementations of Agile to build credibility and acceptance for broader adoption" was recognized by 72% of respondents as a key strategy for gaining organizational buy-in.

Team engagement

Engaging teams is vital for the success of Agile transformation, with several factors identified in this category. The most significant is "Gaining buy-in from both business and technology departments to successful Agile transformation," rated very high by 82% of respondents. This underscores the need for collaboration and alignment between different parts of the organization to ensure a unified approach to Agile.

"Identifying and involving Agile advocates as a driving force for change" was rated very high by 60% of respondents, highlighting the importance of having passionate leaders within teams who can champion the Agile transformation. "Supporting decentralized adoption of Agile practices to a successful transformation" received a very high rating from 54% of respondents, indicating that empowering teams to take ownership of Agile practices is key to their effective implementation (Figure 37).

"Allowing teams and squads to self-organize fostering ownership and commitment" was rated high by 56% of respondents, emphasizing the need for autonomy within teams to cultivate commitment and accountability. Lastly, "Supporting decentralized adoption of Agile practices to a successful transformation" was acknowledged by 54% of respondents as crucial for maintaining momentum and driving change across the organization.

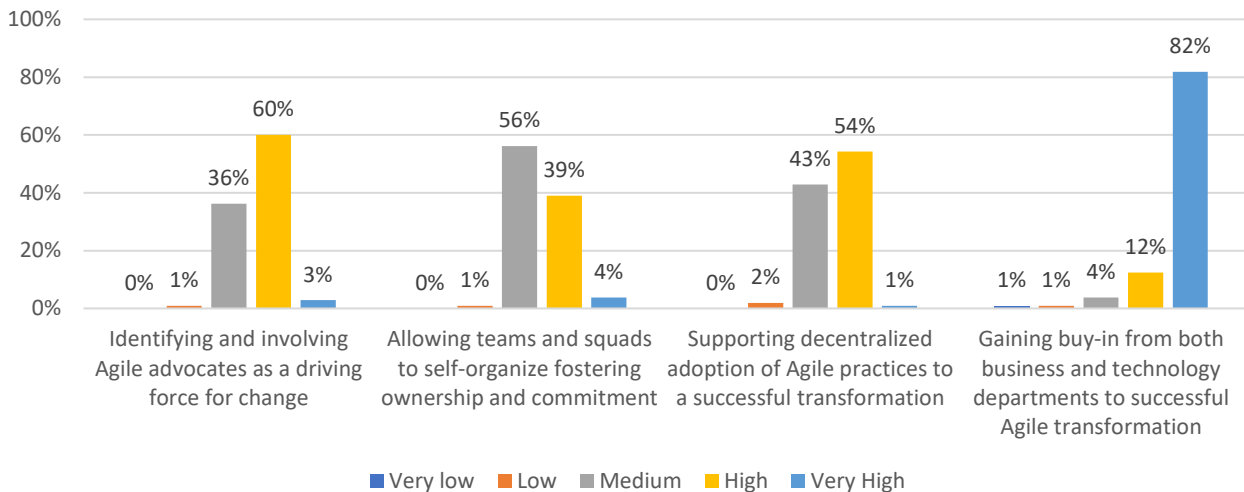


Figure 37 - Success factor 4 analysis - Team engagement

Culture and communication

Establishing a culture that supports Agile and ensuring clear communication throughout the transformation are crucial success factors. "Highlighting early successes to create positive momentum for Agile transformation" is the most critical factor in this category, with 80% of respondents rating it as very high. Celebrating early wins helps build confidence in Agile methodologies and encourages broader adoption (Figure 38).

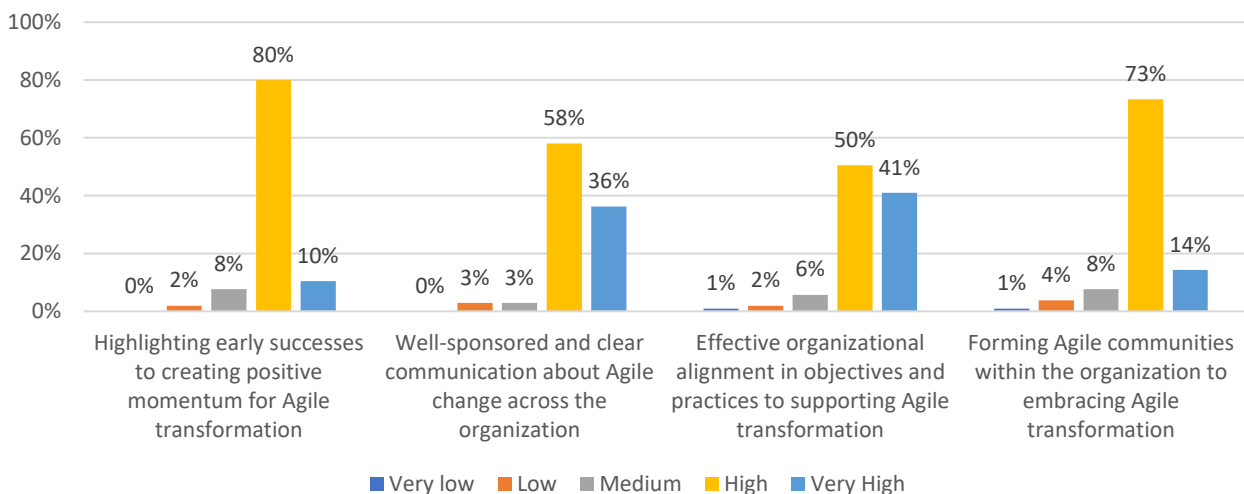


Figure 38 - Success factor 5 analysis - Culture and communication

"Forming Agile communities within the organization to embracing Agile transformation" was rated very high by 73% of respondents, demonstrating the importance of creating support networks and sharing best practices across teams. "Well-sponsored and clear communication about Agile change across the organization" received a very high rating from 58% of respondents, indicating that transparent and consistent communication is essential for ensuring that everyone understands the transformation's objectives and progress.

"Effective organizational alignment in objectives and practices to supporting Agile transformation" was rated very high by 50% of respondents, highlighting the need for all organizational practices to align with Agile's principles. Lastly, "Forming Agile communities within the organization to embracing Agile transformation"

was recognized by 73% of respondents as a key factor in fostering a collaborative and supportive environment for Agile adoption.

Ranking of the most important success factors in Agile adoption

These success factors have been prioritized based on their impact, as indicated by the percentage of respondents who rated them as "very high." The following section provides an in-depth analysis of the most significant enablers of successful Agile adoption, organized by their level of influence on the process.

1. **Gaining buy-in from both business and technology departments to successful Agile transformation (82% very high):** The most impactful success factor, with 82% of respondents rating it as "very high," is gaining buy-in from both business and technology departments. This factor highlights the importance of collaboration and alignment between different parts of the organization to ensure a unified approach to Agile transformation.
2. **Highlighting early successes to create positive momentum for Agile transformation (80% very high):** Another critical success factor is the ability to highlight early successes, which 80% of respondents rated as "very high." Celebrating early wins helps build confidence in Agile methodologies and fosters a positive momentum for broader adoption across the organization.
3. **Specialized training for product owners in the successful application of Agile (74% very high):** Specialized training for Product Owners is another significant factor, with 74% of respondents rating it as "very high." This emphasizes the crucial role that Product Owners play in guiding Agile projects and the need for targeted training to equip them with the necessary skills and knowledge.
4. **Forming Agile communities within the organization to embrace Agile transformation (73% very high):** Forming Agile communities within the organization is also a key success factor, with 73% of respondents rating it as "very high." These communities provide support networks and share best practices, helping to foster a collaborative environment conducive to successful Agile adoption.
5. **Pilot implementations of Agile to build credibility and acceptance for broader adoption (72% very high):** Pilot implementations of Agile, rated as "very high" by 72% of respondents, are instrumental in building credibility and gaining acceptance for broader Agile adoption. Pilots allow organizations to demonstrate the value of Agile methodologies on a smaller scale, paving the way for wider implementation.

3.4 Validation of survey hypotheses

This section analyzes the research hypotheses by exploring how company size and industry sector influence Agile adoption, focusing on key aspects such as performance metrics, challenges, and success factors.

The analysis examines the following research hypotheses:

1. Whether companies in the telecom, media, and technology sectors are advantaged in Agile adoption due to their predisposition for technological innovation
2. Whether mid-to-large-sized companies (251-500 and 500-1000 employees) achieve better Agile performance due to reduced scaling complexities in their transformations
3. Whether mid-to-large-sized companies (251-500 and 500-1000 employees) face fewer challenges in Agile adoption compared to giant enterprises
4. Whether traditional sectors like financial services benefit more from adopting Agile success factors during Scaled Agile transformations

To test these hypotheses, the following methods are used:

- **Cluster analysis:** Groups companies based on similarities in size, sector, and Agile transformation outcomes to identify patterns in Agile adoption experiences.
- **Correlation analysis with heatmaps:** Heatmaps visually represent correlations between company size, industry sector, and Agile outcomes, including performance, challenges, and success factors. These provide insights into the relationships between these variables (Annex 3 – Survey heatmaps).
- **Radar and histogram graphs:** The heatmap results are summarized with radar graphs, using weighted values to represent sector responses. The scale applied is:
 - “Very low” and “Significantly decreased”: -2
 - “Low” and “Slightly decreased”: -1
 - “Medium” and “No change”: 0
 - “High” and “Slightly increased”: 1
 - “Very high” and “Significantly increased”: 2

This approach provides a comprehensive view of how different sectors and company sizes perform across Agile adoption dimensions, allowing for clearer comparisons and insights into the relative advantages and challenges faced by organizations.

3.4.1 Analysis of hypothesis 1 - Advantage of TMT companies in Agile adoption

This section examines the hypothesis that companies in the telecom, media, and technology (TMT) sectors are advantaged in Agile adoption due to their predisposition for technological innovation. By analyzing Agile performance across sectors, the objective is to assess whether TMT companies experience greater success and fewer challenges during Agile adoption, and to what extent sector-specific characteristics influence transformation outcomes.

In the early stages of Agile adoption, the heatmaps and radar charts illustrate uneven improvements across industries, with notable early gains in operational metrics such as team productivity and delivery time (Figure 39):

- **Telco, Media, and Technology (TMT):** TMT companies demonstrate early improvements in response to change and delivery time, reflecting their technological orientation and adaptability. However, gains in team productivity remain lower than in the industrial sector, and improvements in customer and employee satisfaction are moderate. Despite their strong innovation culture, the TMT sector does not emerge as a clear leader in early Agile outcomes, indicating that technological affinity alone does not guarantee accelerated transformation impact.
- **Financial Services (FS):** The FS sector shows modest progress in team productivity and delivery time, with limited advancement in cultural metrics such as customer and employee satisfaction. This lag is likely due to the sector’s regulatory complexity and traditional hierarchical structures, which pose barriers to Agile adoption and delay the realization of its benefits.
- **Energy and Utilities (EU):** EU companies show moderate gains in operational efficiency, particularly in team productivity and delivery time, though their improvements are less pronounced than in TMT or industrial sectors. Response to change remains positive but relatively contained, highlighting the structural challenges faced in adapting Agile to complex, safety-critical environments. Cultural adoption appears slower, with scattered results across satisfaction metrics.

- **Industrial:** The industrial sector clearly leads in the early stage, with the highest values across nearly all metrics. Team productivity, delivery time, customer satisfaction, and employee satisfaction all show strong improvements, reflecting a rapid and cohesive adoption of Agile practices. This sector stands out for translating Agile into both operational efficiency and employee engagement early in the transformation journey.
- **Other sectors:** Organizations classified under "Other" demonstrate strong early gains in team productivity and delivery time. However, performance on change responsiveness and customer satisfaction is less consistent. These variations suggest that companies in niche or mixed-sector categories may face distinct structural and cultural challenges not captured in the core industry segments.



Figure 39 - Agile performance and company sector - Early stage vs initial state

Once Agile practices reach a stable maturity, the heatmaps and radar graphs reveal a more uniform pattern of improvement across all sectors. Operational metrics such as delivery time and team productivity continue to lead, with broader cultural indicators like employee and customer satisfaction also showing stronger consolidation (Figure 40):

- **Telco, Media, and Technology (TMT):** In the stable phase, TMT companies demonstrate sustained progress in response to change, delivery time, and customer satisfaction. However, they are slightly outperformed by the industrial sector in certain metrics. Despite their high innovation capability, TMT organizations do not lead across all dimensions, suggesting that technological agility does not automatically translate into superior performance in cultural or strategic agility. Nevertheless, the continued reduction in delivery time and consistent operational improvements indicate a solid embedding of Agile practices within this sector.
- **Financial Services (FS):** FS organizations exhibit considerable improvements in team productivity, employee satisfaction, and quality of deliverables. These advancements confirm that once Agile is

structurally integrated, its impact becomes more visible in traditionally rigid environments. However, customer satisfaction remains below the levels observed in more dynamic sectors, signaling that front-facing benefits take longer to emerge in regulated, compliance-heavy contexts.

- **Energy and Utilities (EU):** EU companies see some of the highest gains in delivery time, along with substantial progress in team productivity and adaptability. These improvements point to Agile’s ability to enhance operational efficiency even in technically and organizationally complex sectors. Cultural indicators such as customer and employee satisfaction continue to grow but at a more moderate pace, reflecting a slower internalization of Agile values in the sector’s culture.
- **Industrial:** The industrial sector maintains its leadership position in the stable phase, achieving top-tier scores in nearly every metric. Team productivity, response to change, and delivery time show robust and sustained improvements, demonstrating that industrial companies are able to institutionalize Agile practices effectively. The sector also shows significant advances in employee and customer satisfaction, indicating that Agile has been successfully embedded not only at the process level but also in the broader organizational culture
- **Other sectors:** Organizations in the "Other" category report broader improvements in the stable phase, with particularly high gains in team productivity, response to change, and quality of deliverables. Customer and employee satisfaction also improve, although less markedly. These results suggest that with time and stability, Agile adoption becomes more consistent even in sectors not traditionally associated with Agile methodologies, though cultural alignment may still present challenges.

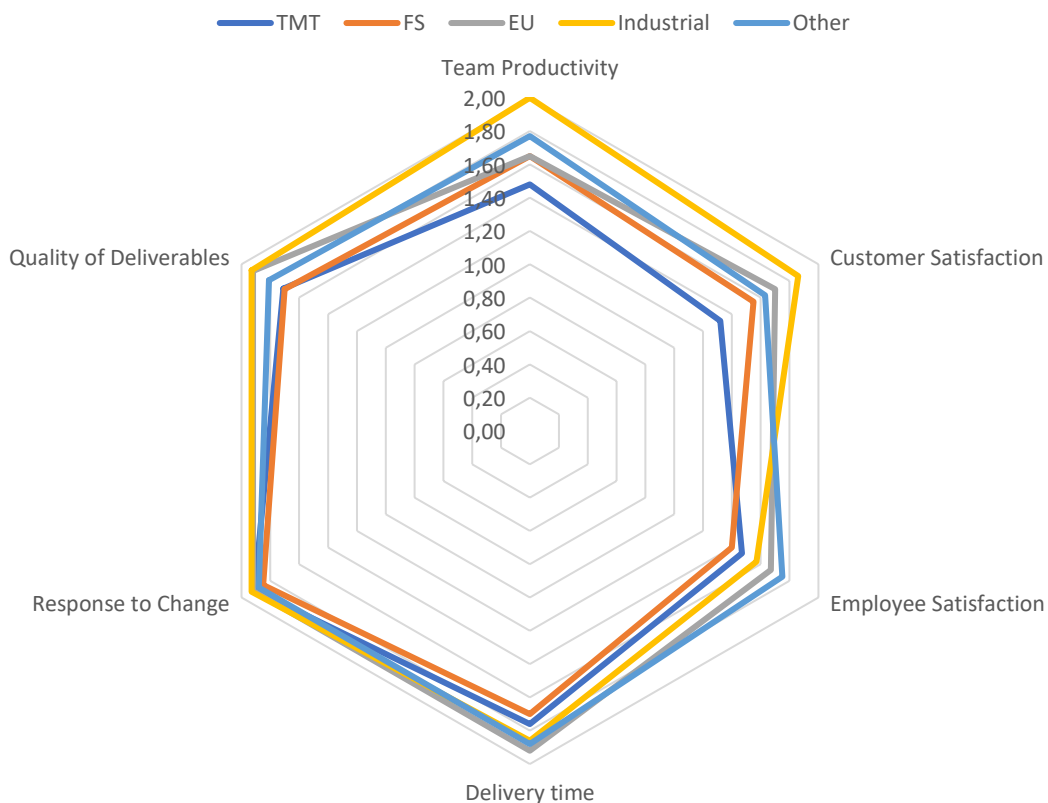


Figure 40 - Agile performance and company sector - Stable adoption vs initial state

3.4.1.1 Hypothesis 1 validation

The data indicates that the telecom, media, and technology (TMT) sector does not outperform other industries in Agile adoption. Despite their strong orientation toward innovation and technology, TMT companies do not show superior results in Agile maturity. In fact, their performance is slightly below average across several Agile metrics, particularly when compared to the industrial sector, which consistently leads in areas such as team productivity, customer satisfaction, and delivery performance.

In the early stage, TMT companies showed some gains in adaptability and delivery time, but these improvements were not markedly superior to those in other sectors. Cultural metrics such as employee and customer satisfaction remained relatively modest, suggesting a slower internalization of Agile values.

In the stable phase, TMT exhibited steady progress across the board but continued to lag slightly behind industrial and energy/utilities sectors in key areas such as team productivity and customer satisfaction. This trend challenges the assumption that TMT organizations are inherently advantaged in Agile transformation due to their technological orientation.

Overall, **the data does not support the hypothesis that TMT companies are significantly better positioned for Agile adoption.** While they benefit from innovation-driven environments, their transformation outcomes remain comparable to or slightly below those of other sectors, underscoring the fact that technology affinity alone is not sufficient to guarantee Agile success.

3.4.2 Analysis of hypothesis 2- Advantage of mid-to-large-sized companies in Agile adoption

This section focuses on the hypothesis that mid-to-large-sized companies (e.g., 251–500 and 501–1000 employees) can achieve better Agile performance due to reduced scaling complexities. By analyzing Agile performance across different company sizes, the aim is to assess whether these mid-to-large-sized organizations benefit from more efficient Agile adoption compared to larger enterprises, providing insights into how scaling complexities impact the effectiveness and outcomes of Agile transformations.

In the early stages of Agile adoption, the radar graph shows distinct performance differences based on company size, with the most significant improvements observed in operational metrics such as team productivity and delivery time (Figure 41):

- **251-500 employees:** This company size group shows strong improvements in team productivity and delivery time. These companies tend to experience the highest gains in operational efficiency in the early stages, likely due to their smaller size and greater agility. Response to change also shows solid results, though employee satisfaction and customer satisfaction register more moderate improvements.
- **501-1000 employees:** This size group exhibits the weakest performance across almost all metrics, particularly in response to change and team productivity. Customer satisfaction and employee satisfaction also show minimal improvements. This suggests that companies in this size range may face more significant challenges in the early stages of Agile adoption, possibly due to transitional complexities that are neither small nor large enough to leverage scalability effectively.
- **1001-5000 employees:** Companies in this range show the highest improvement in team productivity and strong gains in delivery time. Response to change is also well above average. However, customer satisfaction and employee satisfaction are more moderate, indicating that while operational benefits are clear, broader cultural or customer-facing benefits take longer to materialize in this size group.
- **5001-10000 employees:** This group performs similarly to the 1001–5000 range in delivery-related metrics, showing consistent but moderate improvements in team productivity, response to change,

and delivery time. The results suggest that larger organizations benefit from Agile in terms of operational efficiency but may still struggle with embedding Agile deeply across all levels.

- **10000+ employees:** The largest companies show solid improvements in delivery time and response to change. However, team productivity is less pronounced compared to smaller organizations. Gains in customer satisfaction and employee satisfaction remain moderate, indicating that large enterprises may take longer to realize the full cultural and people-related benefits of Agile adoption.

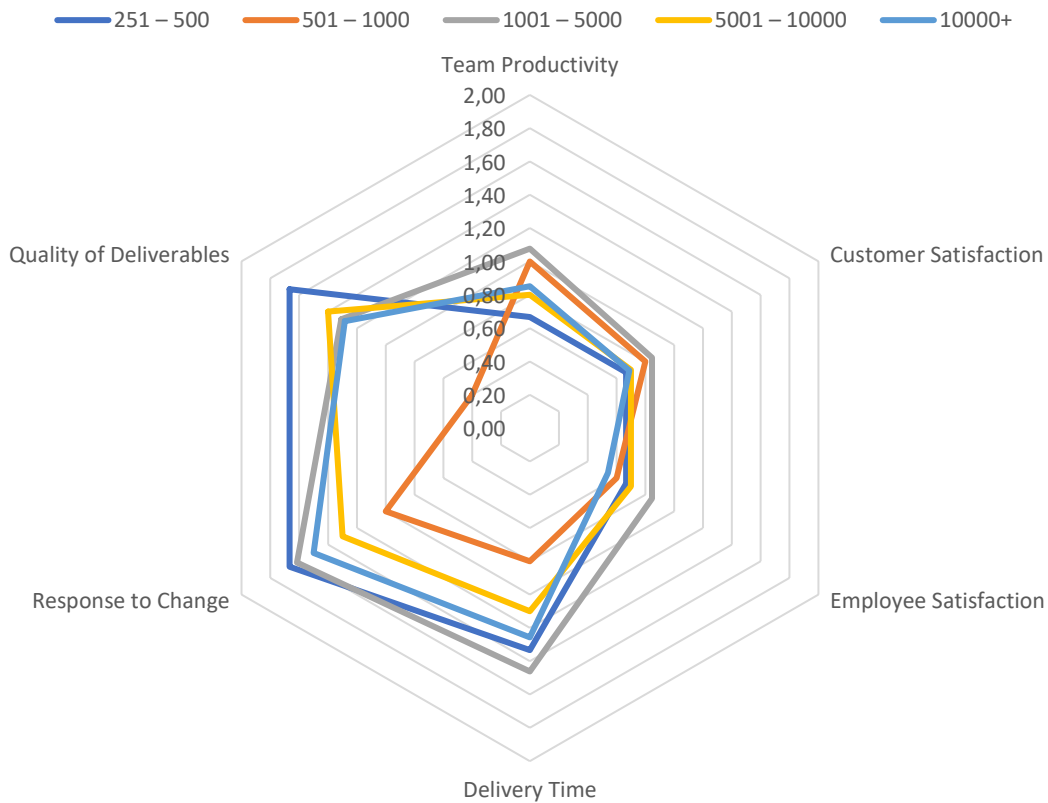


Figure 41 - Agile performance and company dimension - Early stage vs the initial state

Once Agile practices stabilize, the radar graph demonstrates more uniform and significant improvements across all company sizes, particularly in operational metrics such as team productivity, delivery time, and quality of deliverables (Figure 42):

- **251-500 employees:** This group maintains strong performance in quality of deliverables and response to change. However, its team productivity is slightly below other groups, particularly compared to 1000–5000. Employee satisfaction and customer satisfaction also improve but remain moderate. These organizations benefit from their agility but may reach a performance plateau earlier than larger peers.
- **501-1000 employees:** This size group shows the weakest performance across most metrics, especially in delivery time and response to change. While quality of deliverables is slightly improved, team productivity, employee satisfaction, and customer satisfaction remain low. This confirms persistent difficulties in scaling Agile effectively at this intermediate size.
- **1001-5000 employees:** This group shows the highest overall performance across nearly all metrics. Team productivity, delivery time, and quality of deliverables are particularly strong. Customer satisfaction and employee satisfaction also show solid progress, indicating this size may be optimal for both operational and cultural Agile outcomes.

- **5001-10000 employees:** Performance is solid, particularly in response to change and quality of deliverables. Team productivity and delivery time are slightly behind the 1000–5000 group. Employee and customer satisfaction metrics improve but remain moderate. These organizations benefit from scale but may require more effort to unlock full Agile maturity.
- **10000+ employees:** The largest companies show robust improvement in delivery time and quality of deliverables, while team productivity is comparable to smaller peers. Gains in customer satisfaction and employee satisfaction are present but less pronounced. The data suggests that while Agile has become operationally embedded, cultural adoption still lags in very large enterprises.

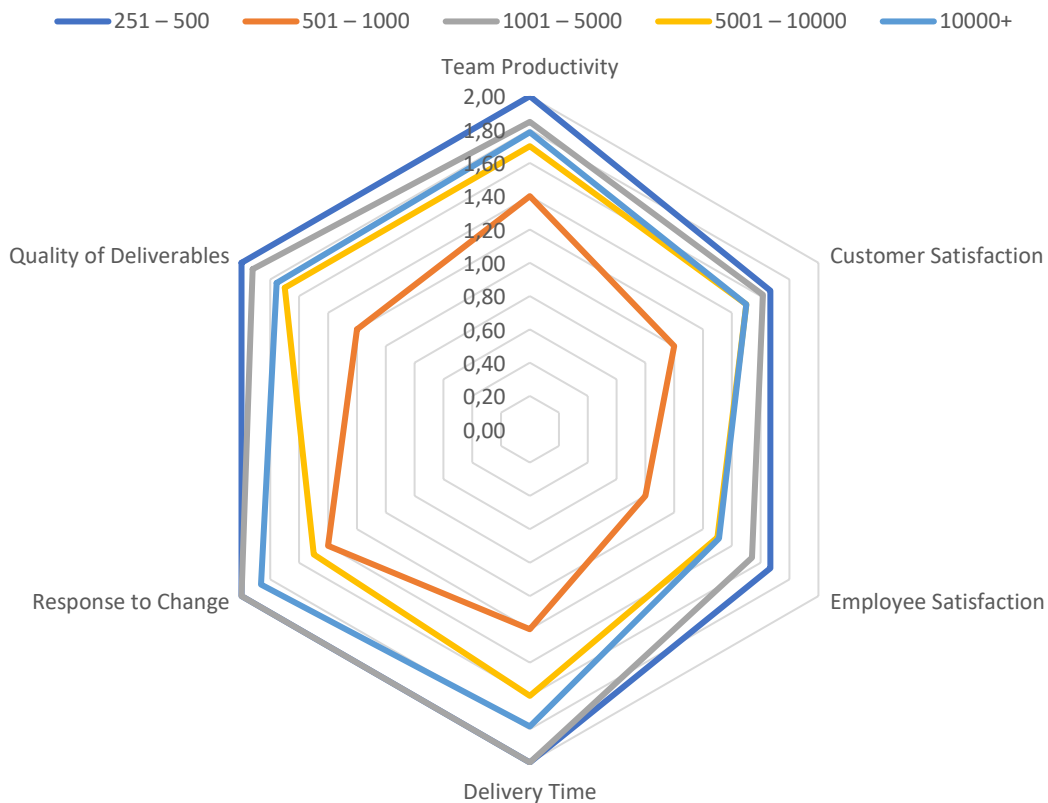


Figure 42 - Agile performance and company dimension - Stable adoption vs initial state

3.4.2.1 Hypothesis 2 validation

The data confirms that mid-sized companies with 251–500 employees achieve stronger Agile performance due to reduced scaling complexities, particularly in operational metrics such as team productivity and delivery time, validating the hypothesis for this group. However, companies with 501–1000 employees face more challenges initially, providing only partial validation of the hypothesis for this size range.

In the early stage, companies with 251–500 employees demonstrate significant improvements in team productivity and delivery time, indicating that their smaller scale allows for greater agility in adopting Agile methodologies. However, employee satisfaction and customer satisfaction show more moderate progress, suggesting that cultural and customer-facing benefits take longer to manifest in this group.

Conversely, companies with 501–1000 employees exhibit weaker performance in the early phase, particularly in response to change and team productivity. These companies struggle to leverage the agility of smaller organizations and face transitional complexities that are not offset by scale advantages. Customer satisfaction and employee satisfaction also show minimal gains, indicating early-stage challenges.

In the stable phase, companies with 251–500 employees maintain strong performance across all metrics, particularly in team productivity, quality of deliverables, and response to change. These sustained improvements further validate the hypothesis for this group, as they continue to benefit from their smaller scale and adaptability.

For 501–1000 employees, there is significant improvement in the stable phase, particularly in quality of deliverables, response to change, and employee satisfaction. While their early-stage performance does not fully support the hypothesis, their long-term gains suggest partial validation, as they overcome initial challenges and begin to realize the benefits of Agile practices over time.

The data supports the conclusion that mid-sized companies (251–500 employees) are top performers in Agile adoption, while 501–1000 employee companies experience delayed but eventual gains, indicating partial support for the hypothesis.

3.4.3 Analysis of hypothesis 3 - Impact of company dimension on Agile adoption challenges

This section addresses the hypothesis that mid-to-large-sized companies (251-500 and 501-1000 employees) face fewer challenges in Agile adoption compared to giant enterprises (1001-5000, 5001-10000, and 10000+ employees). The analysis evaluates how challenges differ across these company sizes by reviewing key categories of Agile adoption challenges.

Resistance to the introduction of Agile methodologies

- **251-500 employees:** This group faces the lowest level of resistance overall. Notable values include the lowest score in myths and misunderstandings (–1.00) and a moderate challenge in lack of executive support (+1.00). Despite a non-negligible managerial reluctance score (+0.67), the overall challenge profile remains milder than that of larger organizations, supporting the hypothesis.
- **501-1000 employees:** This group shows mixed performance. While managerial reluctance is absent (0.00) and lack of executive support is moderate (+0.40), the challenge of myths and misunderstandings remains high (–0.80), and over-enthusiasm for Agile also emerges (–0.60). These results partially validate the hypothesis but also indicate early misalignments in Agile mindset.
- **1001-5000 employees:** This segment faces the highest resistance across almost all categories. Myths and misunderstandings (–1.31), managerial reluctance (+1.15), lack of executive support (+0.85), and over-enthusiasm (–1.31) all indicate substantial structural and cultural barriers, invalidating the hypothesis for this size group.
- **5001-10000 employees:** Similar to the previous group, resistance remains high, particularly in lack of executive support (+1.10) and managerial reluctance (+1.10). This group also shows challenges in adjusting established routines (+0.80) and experiences over-enthusiasm (–1.20). Agile resistance is widespread, suggesting major transformation frictions.
- **10000+ employees:** Large enterprises continue to experience substantial resistance. Managerial reluctance (+0.96) and lack of executive support (+0.96) remain high, while myths and misunderstandings (–0.76) and over-enthusiasm (–0.92) suggest confusion and cultural misalignment around Agile principles. These factors confirm the difficulty in achieving Agile maturity at this scale.
- **Conclusion:** The data supports the hypothesis for companies with 251–500 employees, which consistently report the lowest levels of resistance. For the 501–1000 range, results are mixed but generally more favorable than for larger enterprises, offering partial validation. In contrast, organizations above 1000 employees face significant resistance across both cultural and structural dimensions, making Agile adoption more complex and challenging (Figure 43).

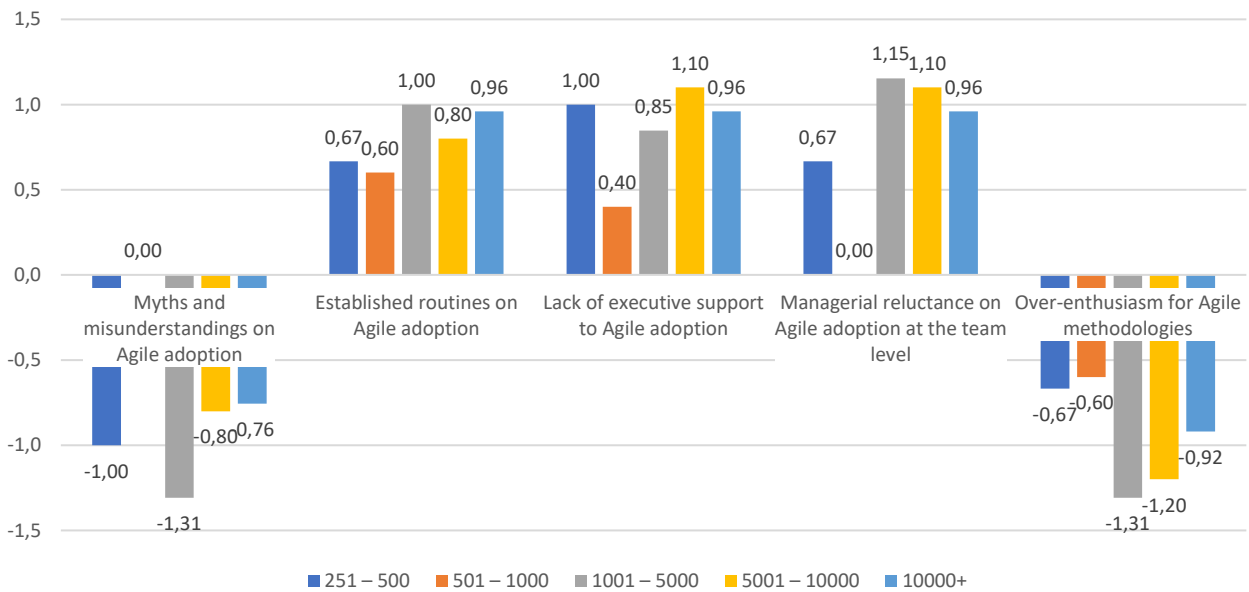


Figure 43 - "Resistance to the Agile introduction" challenge category on company dimensions

Lack of Agile knowledge

- 251-500 employees:** This group shows consistently high challenges across all categories, with values around +1.33. Despite the smaller size, companies in this range face significant issues with inconsistent understanding of Agile, unclear managerial roles, training deficits, and transformation effectiveness. These results contradict the hypothesis that smaller mid-sized companies face fewer Agile knowledge-related challenges.
- 501-1000 employees:** This size group records the lowest challenge levels across nearly all categories. Inconsistent understanding is at +0.40, unclear roles at +0.60, training and coaching at +1.00, and transformation effectiveness also at +1.00. These results support the hypothesis for this group, indicating fewer difficulties in scaling Agile knowledge compared to both smaller and larger organizations.
- 1001-5000 employees:** This group faces the highest overall challenges. Scores peak at +1.69 for inconsistent understanding and +1.77 for inaccurate transformation. These values reflect significant difficulty in ensuring Agile knowledge is consistently understood and applied across large teams.
- 5001-10000 employees:** Challenge levels remain high, particularly in inconsistent understanding (+1.40) and transformation effectiveness (+1.20), showing persistent difficulties in Agile knowledge dissemination at scale.
- 10000+ employees:** Large enterprises continue to experience high challenge levels across all dimensions, with values between +1.11 and +1.43. These figures confirm structural obstacles in delivering Agile training, defining roles, and achieving consistent understanding (Figure 44).
- Conclusion:** The hypothesis is validated for 251-500 employees, who face fewer challenges. For 501-1000 employees, the hypothesis is partially validated, as their challenges are higher than the smaller mid-sized group but still lower than for larger enterprises.

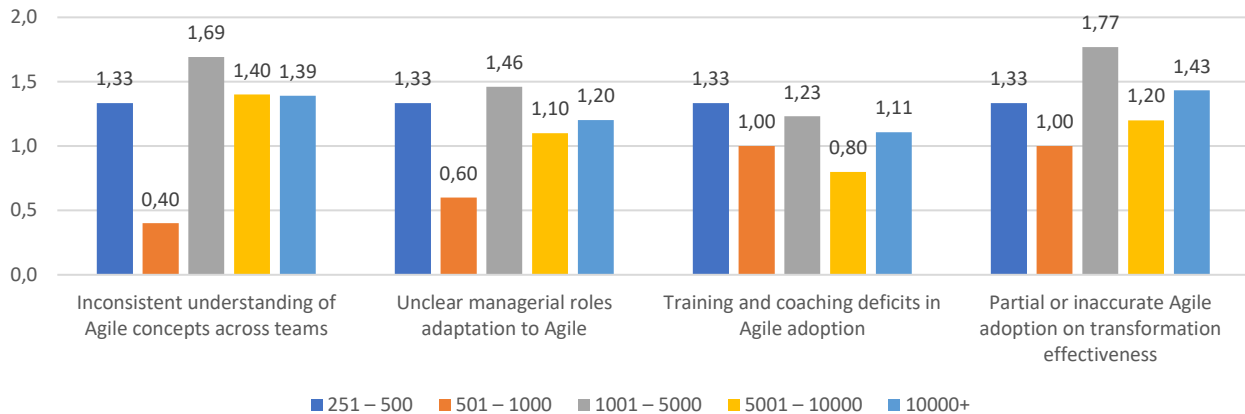


Figure 44 - "Lack of Agile knowledge" challenge category on company dimensions

Transition turbulence

- 251-500 employees:** This group shows very high challenge levels, with peak values of 2.00 for Sticking to waterfall practices and Old bureaucratic practices. Other challenges like Not adjusting workloads and Running Agile and traditional methodologies also show substantial values. Contrary to the hypothesis, this size group experiences significant turbulence during Agile transitions.
- 501-1000 employees:** This size group reports the lowest challenge levels across all categories, ranging from 0.40 to 0.90. These results suggest that this group encounters less turbulence than both smaller and larger companies, contradicting the hypothesis and indicating relative stability in Agile transformation.
- 1001-5000 employees:** Companies in this range experience high and consistent challenge levels, with values up to 1.92 and 1.85. Key issues include persistence of waterfall practices and dual use of Agile and traditional methodologies, highlighting complex structural resistance during transition.
- 5001-10000 employees:** This group shows moderately high turbulence, with values between 1.00 and 1.40. Transition challenges are evident but slightly less intense compared to the 1000-5000 range.
- 10000+ employees:** The largest companies face significant transition turbulence, with values from 1.20 to 1.77. Challenges such as entrenched bureaucratic practices and hybrid delivery models are especially pronounced.
- Conclusion:** The hypothesis is validated for 251-500 employees, as they experience fewer challenges in transition turbulence. For 501-1000 employees, the hypothesis is partially validated, as the values are higher but still lower than for giant enterprises (Figure 45).

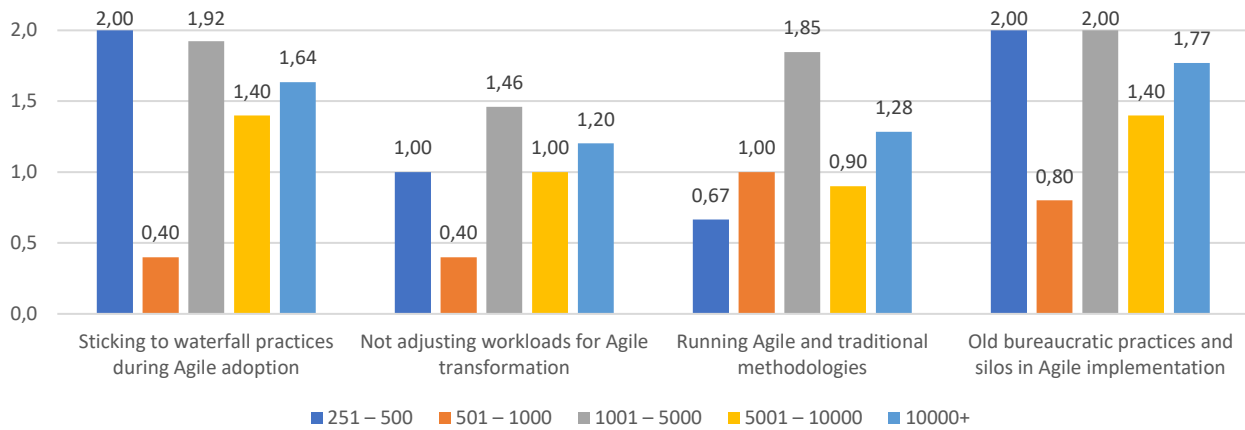


Figure 45 - "Transition turbulence" challenge category on company dimensions

Multi-Team environments

- 251-500 employees:** This group faces moderate challenges with Sticking to waterfall practices (+0.67) but encounters fewer difficulties in other areas. Notably, they report negative values in Running Agile and traditional methodologies (-0.67), indicating relative maturity in avoiding dual approaches. Overall, this group shows limited issues in multi-team Agile coordination.
- 501-1000 employees:** This is the least challenged group across all dimensions. It reports neutral or negative values, including the lowest score (-0.80) for Old bureaucratic practices, and no issues with Not adjusting workloads. This suggests that this company size is well-positioned to manage Agile in multi-team settings, fully validating the hypothesis.
- 1001-5000 employees:** This group shows moderate challenge levels, with Sticking to waterfall practices at +0.54 and minor presence of Old bureaucratic practices (+0.31). However, challenges in Running Agile and traditional methodologies (-0.20) are minimal, indicating some success in integrating Agile at scale.
- 5001-10000 employees:** This size group experiences low challenge levels, reporting small positive values for Sticking to waterfall (+0.30) and Old bureaucratic practices (+0.40). Other categories are neutral or negligible, suggesting a manageable level of difficulty in coordinating Agile across teams.
- 10000+ employees:** The largest companies show slightly higher values in Sticking to waterfall (+0.76) but report negative or neutral values in all other categories. Despite their scale, these companies appear to have made progress in mitigating coordination challenges in multi-team Agile environments.
- Conclusion:** The hypothesis is validated for 251-500 employees, who face fewer challenges in multi-team environments. For 501-1000 employees, the hypothesis is partially validated, as they face more challenges than smaller companies but fewer than larger ones (Figure 46).

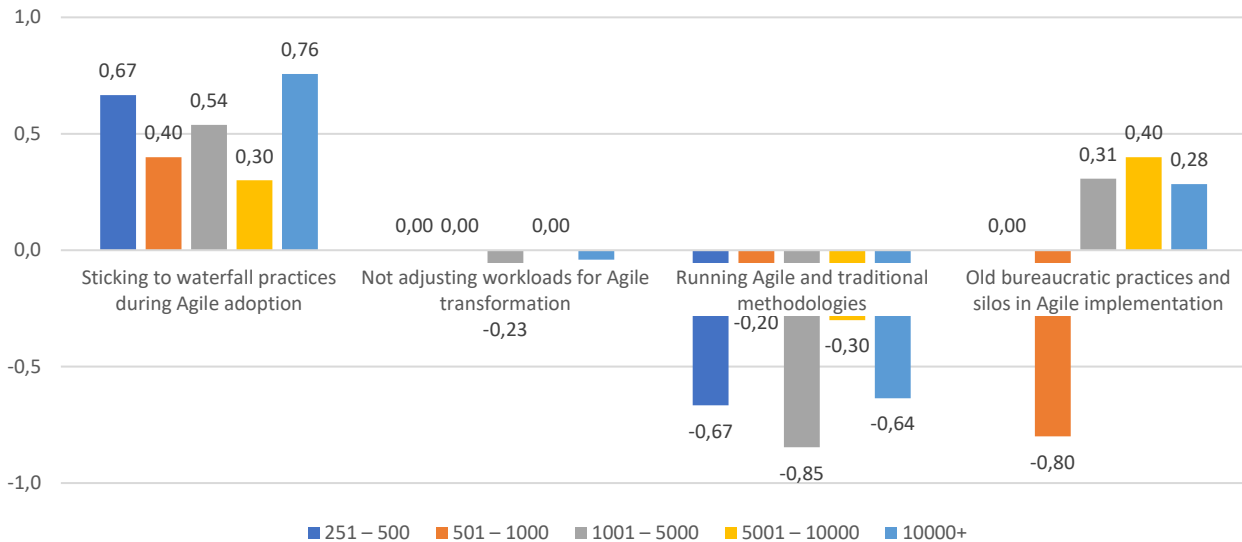


Figure 46 - “Multi-team environments” challenge category on company dimensions

Requirements and process management

- 251-500 employees:** This group faces moderate challenges, especially with Agile’s short development cycles impacting other functions (+1.33) and breaking down high-level requirements (+1.00). Other areas such as regulatory processes (+0.67) and managing high-level requirements (+0.67) remain below average. These values support the hypothesis that smaller structures manage process-related challenges more effectively.
- 501-1000 employees:** This group is the least challenged across the board. It reports the lowest or null values in most categories, including regulatory processes (–0.60), managing high-level requirements (–0.20), and breaking down requirements (0.00). This confirms a strong validation of the hypothesis, indicating that this size group can efficiently handle Agile requirements and workflows.
- 1001-5000 employees and larger:** This group faces the highest challenges in the category. It scores the highest in all five areas, with peaks in short development cycles (+1.92), managing high-level requirements (+1.31), and breaking down requirements (+1.31). These figures suggest major difficulties in aligning Agile processes with existing organizational structures.
- 5001-10000 employees:** Challenges remain high for this group, though slightly lower than the 1001–5000 range. Key issues are evident in short development cycles (+1.40), creating effort estimation stories (+1.01), and managing high-level requirements (+1.00), indicating persistent complexity in requirements management.
- 10000+ employees:** This size group also faces substantial challenges, with short development cycles (+1.43) and creating effort estimation stories (+1.03) being the most critical. However, values are slightly lower than the 1001–5000 group, suggesting some maturity in addressing these barriers over time.
- Conclusion:** The hypothesis is validated for the 501–1000 employee group, which shows the lowest difficulty in requirements and process management. The 251–500 group also performs relatively well, though with slightly higher values. Larger enterprises continue to face significant structural and procedural obstacles (Figure 47)

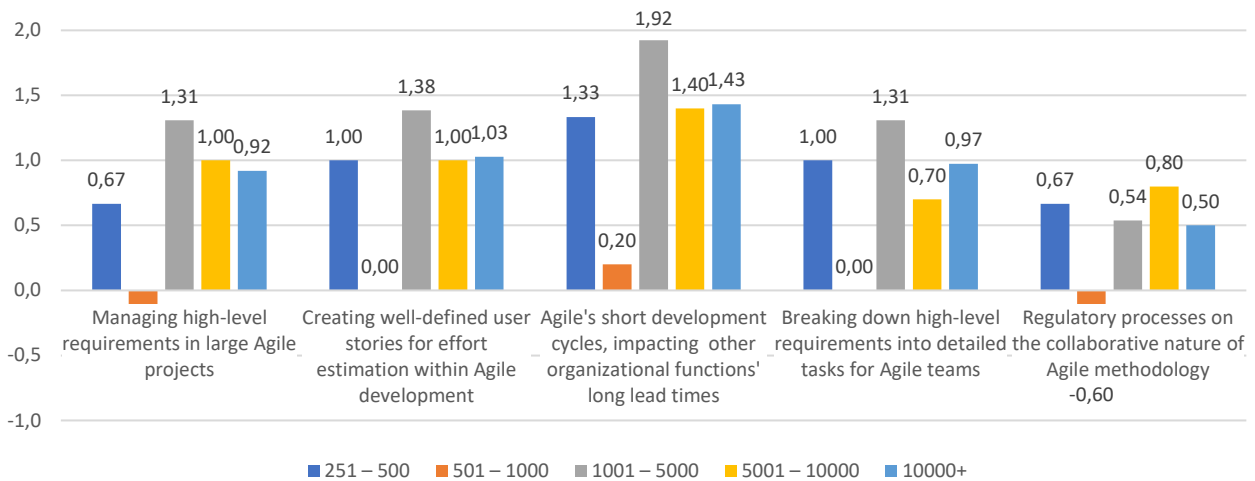


Figure 47 - "Requirements and process management" challenge category on company dimensions

3.4.3.1 Hypothesis 3 validation

The data supports the **validation of the hypothesis for companies with 251-500 employees**. These mid-sized companies consistently face fewer challenges in Agile adoption across all categories, benefiting from reduced complexity in managing transitions, multi-team environments, and resistance to Agile methodologies. Their smaller scale enables smoother transitions, less resistance, and more effective management of Agile knowledge and processes.

For companies with 501-1000 employees, the hypothesis is partially validated. Although they face more substantial challenges than companies in the 251-500 range, their challenge levels are still lower than those for larger enterprises. The increase in complexity as company size grows introduces greater obstacles, particularly in managing multiple teams, scaling Agile knowledge, and handling requirements and process management. However, these companies do not face the same level of difficulty as giant enterprises.

For giant enterprises (1001-5000 and above), the data clearly shows that they experience the highest levels of challenges across all categories. These companies face significant difficulties in scaling Agile practices, managing knowledge dissemination, and coordinating Agile methodologies across large and complex organizational structures.

In summary, the hypothesis is validated for 251-500 employee companies, which consistently face fewer challenges in Agile adoption. For 501-1000 employee companies, the hypothesis is only partially validated, as they encounter more significant obstacles than smaller mid-sized companies but still fewer than giant enterprises.

3.4.4 Analysis of hypothesis 4 - Impact of company sector on Agile adoption success factors

This section focuses on the hypothesis that traditional sectors, such as Financial Services (FS), benefit more from the adoption of Agile success factors (e.g., leadership support, training, team engagement, and cultural communication) during Scaled Agile transformations compared to other sectors. The goal is to assess how success factors support each sector in Agile adoption and determine whether FS derives more advantages than other sectors.

Leadership support

- **Telco, Media, and Technology (TMT):** This group shows moderate leadership support, with values ranging from +0.67 to +1.19. While engagement is present, TMT lags behind sectors like Industrial and EU in leadership-driven Agile enablement.
- **Financial Services (FS):** This group demonstrates the lowest leadership support overall, with scores between +0.55 and +1.07. Although some support exists, FS does not appear to significantly benefit from leadership in scaling Agile transformations.
- **Energy and Utilities (EU):** This group exhibits strong leadership involvement, especially in Agile strategy mapping (+1.42) and coordination (+1.25). The values consistently range from +0.80 to +1.42, highlighting robust executive commitment.
- **Industrial:** This group reports the highest leadership support across nearly all categories, with values ranging from +1.13 to +1.67. The peak score in defining the Product Owner role (+1.67) confirms deep leadership engagement in Agile success factors.
- **Other:** This group shows relatively strong leadership support, with values between +0.69 and +1.38. While not as consistently high as Industrial or EU, this sector benefits from meaningful leadership backing in Agile initiatives.
- **Conclusion:** The hypothesis is **not supported** in this category. Financial Services does not exhibit the highest leadership support. Instead, the Industrial and EU sectors demonstrate stronger and more consistent executive involvement in enabling Agile success (Figure 48).

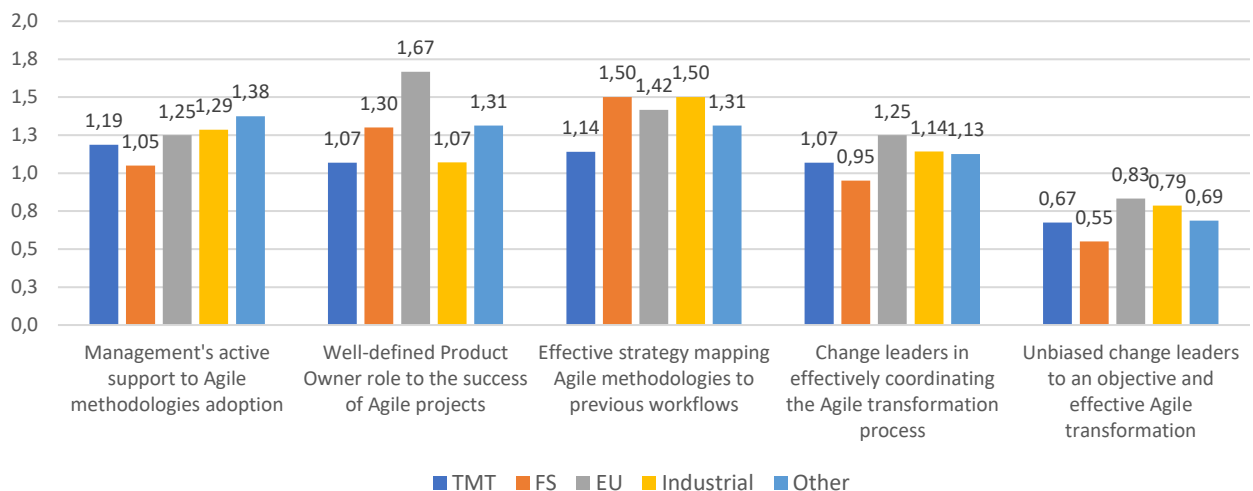


Figure 48 - "Leadership support" success factor category on company sector

Training and coaching

- **Telco, Media, and Technology (TMT):** This group shows strong commitment to training and coaching, particularly in customizing Agile practices (+1.63) and educating management (+1.26). However, it does not lead in any single category, suggesting effective but not top-tier emphasis on training.
- **Financial Services (FS):** This group demonstrates moderate to high values, with peaks in Agile coaching (+1.20) and customizing Agile practices (+1.75). While FS performs well, it does not lead in any dimension and is surpassed by Industrial and Other sectors in key categories.

- **Energy and Utilities (EU):** This group shows consistent mid-level performance, with values ranging from +1.00 to +1.45. Though it maintains a solid approach to training, it does not excel compared to other sectors.
- **Industrial:** This group leads in multiple training dimensions, including the highest score in Agile training for employees (+1.93) and strong performance in customizing practices (+1.79) and management education (+1.64). These results indicate a sector-wide prioritization of training as a transformation enabler.
- **Other:** This group ranks highest overall in customizing Agile practices (+1.88) and shows strong values in most categories, including employee training (+1.69) and management education (+1.56), highlighting broad and effective training investment.
- **Conclusion:** The hypothesis is **not supported** in this category. Financial Services does not lead in training and coaching. Instead, the Industrial and Other sectors exhibit the highest commitment to this success factor, both in breadth and intensity (Figure 49).

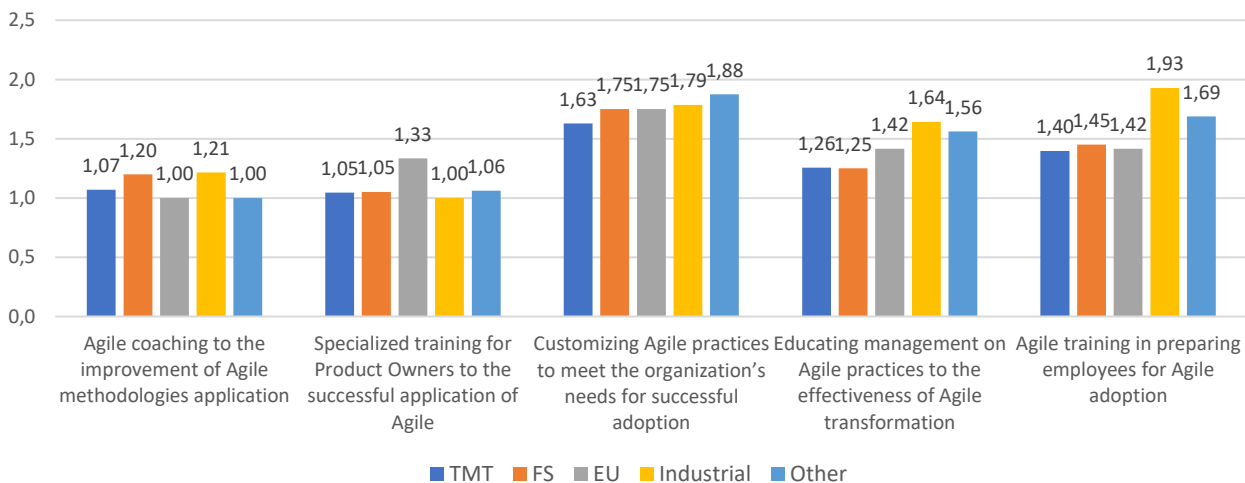


Figure 49 - "Training and coaching" success factor category on company sector

Team engagement

- **Telco, Media, and Technology (TMT):** This group demonstrates moderate team engagement, with values ranging from +0.53 to +1.65. It performs well in gaining buy-in from business and technology (+1.65), but other engagement indicators remain lower.
- **Financial Services (FS):** This group shows polarized results. It records the highest value in business–technology buy-in (+1.70), but significantly lower scores in fostering team self-organization (+0.35) and Agile advocate involvement (+0.45), suggesting limited bottom-up engagement.
- **Energy and Utilities (EU):** This group displays mixed engagement. While buy-in from business and tech is high (+1.83), it scores low in decentralized support (+0.36) and moderate in self-organization (+0.43), indicating a focus on executive alignment over grassroots engagement.
- **Industrial:** This group performs best in team engagement overall. It scores highest in Agile advocate involvement (+0.93), business–tech buy-in (+1.86), and self-organization (+0.58), reflecting strong support for team autonomy and organizational alignment.
- **Other:** This group also shows strong engagement across the board, with high values in buy-in (+1.81) and Agile advocate involvement (+0.81), although it scores lower in decentralized adoption (+0.44).

- **Conclusion:** The hypothesis is **not confirmed** in this category. Financial Services does not lead in team engagement, especially in grassroots dimensions like self-organization or advocate involvement. Instead, the **Industrial sector** shows the most balanced and high engagement, making it the top performer in this success factor (Figure 50).

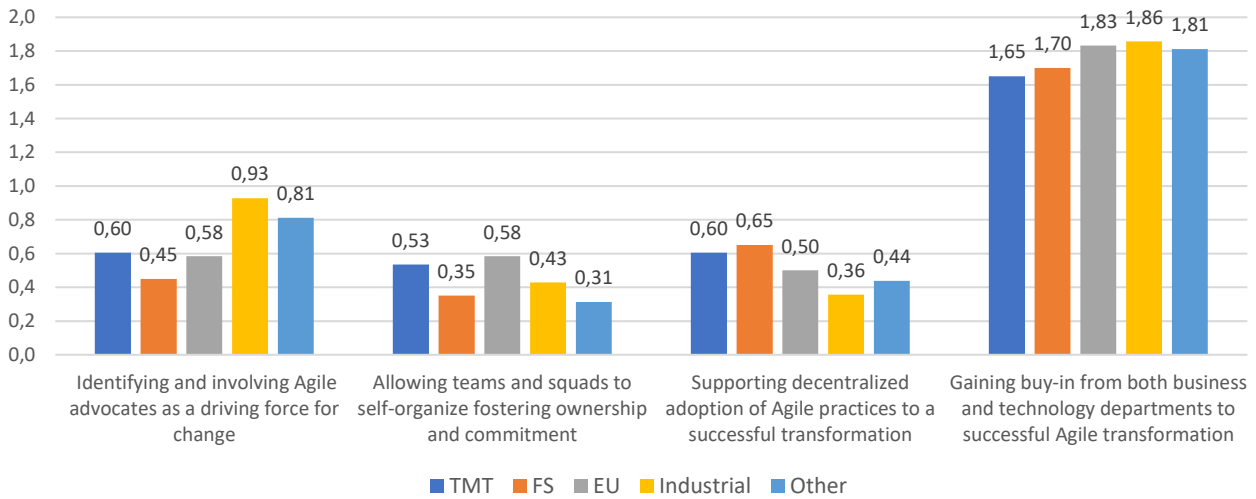


Figure 50 - "Team engagement" success factor category on company sector

Culture and communication

- **Telco, Media, and Technology (TMT):** This group shows moderate values across all indicators, with scores ranging from +0.95 (early successes) to +1.21 (communication). It indicates a consistent but not leading use of cultural communication in Agile transformation.
- **Financial Services (FS):** This group performs well in organizational alignment (+1.45) and communication (+1.15), but lower in forming Agile communities (+1.05) and highlighting early successes (+1.05). Overall, FS demonstrates strong cultural alignment, though not sector leading.
- **Energy and Utilities (EU):** This group shows moderate to strong performance. It leads in highlighting early wins (+1.17), performs well in communication (+1.58), and maintains high values in alignment (+1.42). However, community-building is slightly lower (+0.83), making its cultural emphasis somewhat top-down.
- **Industrial:** This group leads the category, scoring the highest in both communication (+1.64) and alignment (+1.50). It also performs well in highlighting early successes (+0.94) and community formation (+1.00), showing comprehensive cultural engagement.
- **Other:** This group records the lowest values across the board, from +0.75 to +1.19, suggesting a weaker reliance on cultural and communication levers in Agile success.
- **Conclusion:** The hypothesis is not validated in this dimension. Financial Services does not lead in culture and communication. The Industrial sector shows the most consistent and highest values, suggesting it benefits the most from cultural alignment and communication in supporting Agile transformations (Figure 51).

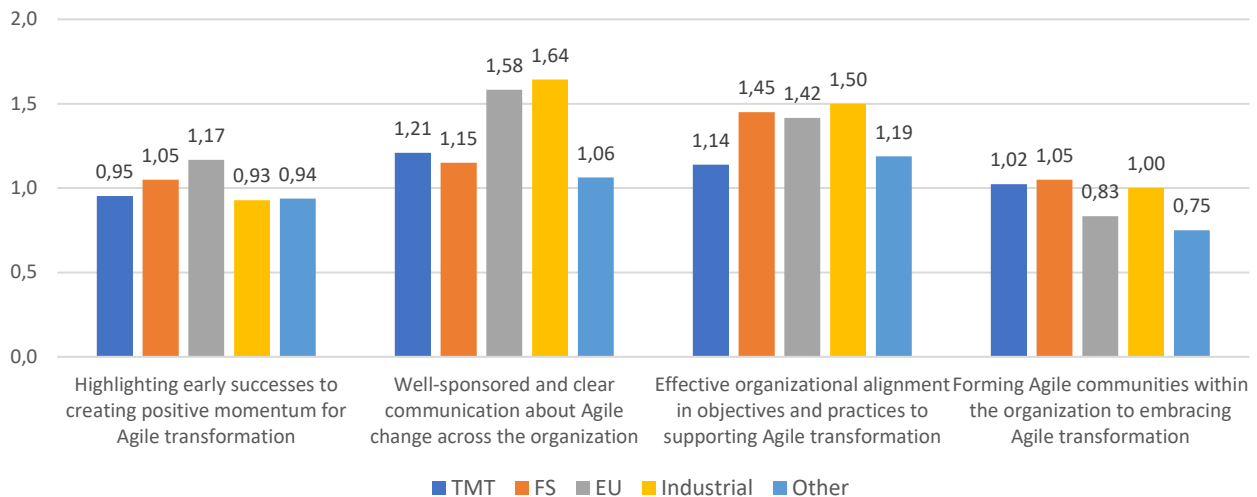


Figure 51 - "Culture and communication" success factor category on company sector

Clear and smooth transition

- **Telco, Media, and Technology (TMT):** This group shows moderate scores across all indicators, ranging from +0.70 (pilot implementations) to +1.14 (simplifying practices). TMT demonstrates a structured approach but does not lead in any subcategory.
- **Financial Services (FS):** This group presents balanced values from +0.75 (pilot implementations) to +1.20 (leadership commitment). It shows consistent engagement in transition strategies, although not sector leading.
- **Energy and Utilities (EU):** This group clearly leads this success factor. It records the highest value in simplifying practices (+1.50) and strong leadership commitment (+1.42), confirming its ability to enable smooth Agile transitions.
- **Industrial:** This group maintains strong results, with scores of +1.44 (leadership), +1.14 (simplifying practices), and +0.79 (pilot implementations). These values indicate a solid foundation for clear and sustainable Agile transitions, second only to EU.
- **Other:** This group performs well in all dimensions, especially in leadership commitment (+1.44) and simplifying practices (+1.31). Despite its heterogeneity, it achieves results comparable to Industrial and FS.
- **Conclusion:** The hypothesis is not validated for this category. Financial Services does not benefit the most from clear and smooth transitions. Instead, Energy and Utilities demonstrates the strongest performance, followed by Industrial and Other sectors (Figure 52).

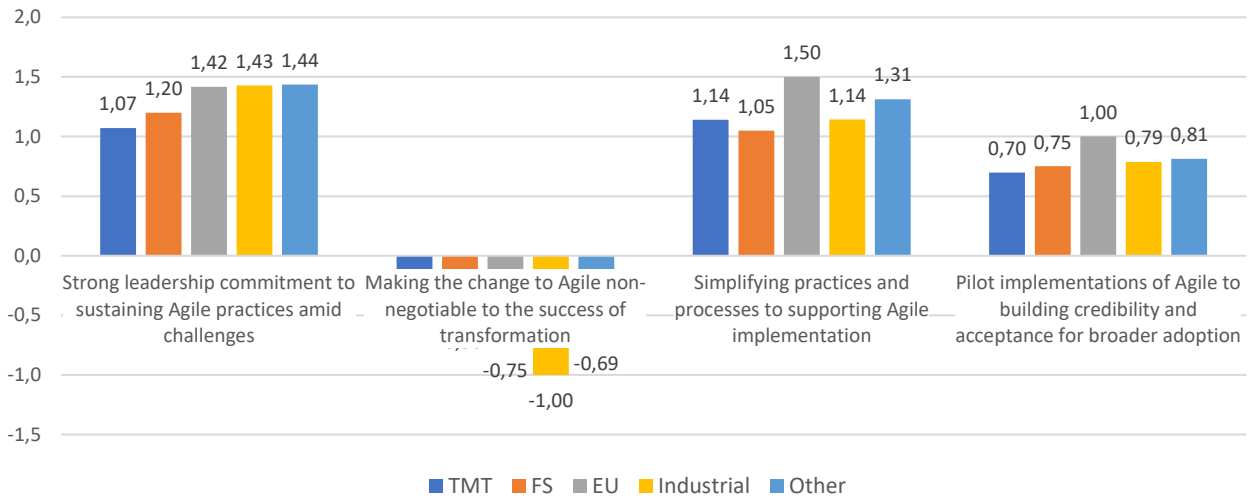


Figure 52 - “Clear and smooth transition” success factor category on company sector

3.4.4.1 Hypothesis 4 validation

The data does **not validate** the hypothesis that the Financial Services (FS) sector benefits more from Agile success factors during Scaled Agile transformations. FS shows solid performance in some areas, particularly in business–technology alignment and selected aspects of training but does not lead in any success factor category overall.

- Financial Services (FS) shows selective strengths, such as business–technology buy-in (+1.70) and moderate training scores (+1.75 in customizing practices), but lags in leadership support, grassroots team engagement, and cultural communication
- Energy and Utilities (EU) and Industrial sectors consistently outperform FS across leadership, training, culture, and transition dimensions, highlighting more comprehensive and balanced adoption of Agile success factors

Conclusion: The hypothesis is not validated. While FS benefits from some Agile success factors, especially in structured and regulated dimensions, it does not benefit more overall than other traditional sectors like EU or Industrial. These sectors exhibit broader and more consistent gains across all success factor categories.

3.5 Survey limitations

While this survey provides valuable insights into Agile transformations, it is important to acknowledge its limitations:

- **Sample size:** The survey collected a total of 105 valid responses after applying the exclusion criteria. Although this sample size is considered scientifically valid and significant, it represents a relatively small portion of the potential respondent pool. Future research could benefit from extending the survey to gather more responses, thereby enhancing the robustness of the findings.
- **Network influence:** The sample of responses may be influenced by the researchers’ personal network, leading to a potential bias towards companies in the telecommunications, media, and technology sectors. Additionally, nearly all responses were from European companies, which may also be a result of the researchers’ network. This geographical concentration could limit the generalizability of the results to other regions.

Despite these limitations, the survey yielded interesting and valuable results. It successfully evaluated and compared the main challenges and success factors associated with Agile transformations. Moreover, it

highlighted the most critical domains and areas during a Scaled Agile transformation, providing insights that can be useful for both academic research and practical applications in the field of Agile methodologies. Future studies can build on these findings, addressing the identified limitations to further expand the understanding of Agile transformations across different sectors and regions.

4 Case study: Scaled Agile transformation in an international telco operator

This chapter examines the relevance of Agile methodologies within the telecommunications sector and outlines the specific objectives guiding the analysis. Its aim is to explain why telecom companies represent a particularly suitable context for observing large scale Agile adoption, highlighting the sector's structural pressures, operational complexity and demand for rapid innovation. The expected outcome is to clarify how these characteristics make the telecom industry a critical domain for understanding the conditions that enable or constrain Scaled Agile transformation.

Agile methodologies have become a fundamental component of the telecommunications industry, reflecting their critical role in addressing the challenges of rapid technological advancements and heightened competition. The dynamic nature of the telecom sector necessitates a flexible and adaptive approach to project management and product development, making Agile methodologies particularly valuable [69].

Agile practices enable telecom companies to enhance their responsiveness to market changes and customer demands. Traditional project management methods, with their rigid structures and long cycles, are often inadequate in an environment where technological innovations and consumer preferences are continuously evolving. Agile methodologies, characterized by iterative development and continuous feedback loops, allow telecom operators to accelerate the delivery of new products and services. This increased speed to market is essential for maintaining a competitive edge and meeting the high expectations of modern consumers [70].

The implementation of Agile frameworks fosters a culture of collaboration and transparency within telecommunications organizations. Cross-functional teams, which include members from diverse departments such as IT, marketing, and customer service, work together closely, ensuring that different perspectives are integrated into the development process. This collaborative environment not only streamlines workflows but also enhances the innovation and customer-centricity of the solutions produced.

Agile transformation also supports the efficient management of complex projects typical in the telecom industry. Telecom operators often deal with large-scale initiatives that involve numerous interdependencies and significant risks. Agile frameworks, such as the Scaled Agile Framework (SAFe), provide a structured yet flexible approach to managing these complexities. By promoting iterative progress and regular reassessment, Agile methodologies enable better resource allocation, risk management, and overall project governance [71].

Moreover, Agile practices facilitate continuous improvement and quality enhancement through regular feedback from stakeholders and customers. This iterative process ensures that products and services are constantly refined to better meet user needs and industry standards. By maintaining a close dialogue with customers, telecom companies can anticipate market trends and adjust their strategies accordingly, thereby enhancing customer satisfaction and loyalty [72].

4.1 Context of the case study

This case study focuses on an international telecommunications operator with a significant global presence. The company operates in over 30 countries, offering a wide range of services, including mobile communications, fixed-line services, and broadband solutions. With a robust and expansive network infrastructure, this telecom operator provides innovative digital services and connectivity solutions to millions

of customers worldwide. The company's dedication to delivering high-quality communication services supports a diverse array of business and consumer needs, ensuring reliability and excellence in the telecommunications sector.

The case study specifically examines the Digital Product Development department, a crucial division within the company that drives the creation and management of digital products for both B2B and B2C markets. This department is responsible for developing solutions that meet the diverse and evolving needs of enterprise clients, as well as consumer-focused offerings that enhance everyday connectivity and communication. By focusing on the development of both business and consumer digital products, the Digital Product Development department plays a vital role in the company's strategy to lead the market in digital innovation, ensuring that the company remains competitive and responsive to customer demands in an increasingly digital world.

4.1.1 Research design and methodological approach

To ensure methodological rigor and enable structured insight generation, this research followed a well-established framework for case study analysis [73]. This framework defines four possible design configurations, based on two primary dimensions: the number of cases involved (single or multiple) and the analytical structure of each case (holistic or embedded).

- A **holistic single-case design** refers to the in-depth analysis of a single case treated as one unified unit of analysis. This approach is typically applied when the case is critical, unique, or representative of a broader phenomenon.
- An **embedded single-case design** also focuses on a single case but includes multiple units of analysis within it. This design allows for a more granular understanding of internal dynamics and comparative perspectives across sub-units, such as departments or teams within the same organization.
- A **holistic multiple-case design** involves the study of several distinct cases, each considered as a whole. It is particularly suitable for comparative analysis, pattern identification, and theory building across varied organizational settings.
- An **embedded multiple-case design** extends the analytical depth further by examining multiple cases, each with multiple internal units of analysis. This configuration supports complex, multi-layered investigations across diverse organizational structures or geographies.

The design adopted for this research corresponds to the embedded single-case model, as it allows for the examination of multiple units within a single organization. Specifically, the study focuses on two distinct units within the Digital Product Development department of a global telecommunications operator. These units are responsible for the definition and development of digital solutions targeting the B2B and B2C segments, respectively.

This structure enables the research to contrast how the Scaled Agile transformation has been interpreted, implemented, and experienced across both business-facing and consumer-facing product domains. By comparing these perspectives within the same organizational framework, the study gains a deeper understanding of the transformation's effectiveness, challenges, and outcomes across differentiated yet interdependent value streams.

4.1.2 Information collection methodology for the case study

To gather comprehensive and accurate information for this case study, a multi-faceted approach was employed, combining direct interviews with key stakeholders and an in-depth review of relevant documentation and tools:

- **Interview with the department Director:** An interview was conducted with the director of the Digital Product Development department. This session provided high-level insights into the strategic goals, challenges, and outcomes of the Scaled Agile transformation from a leadership perspective.
- **Interview with the Product Manager (PM):** A detailed interview with the Product Manager allowed for an in-depth understanding of the operational aspects of product development. This discussion covered the day-to-day challenges faced, the impact of Agile practices on product delivery, and the alignment of product goals with broader business objectives.
- **Interview with the SAFe Release Train Engineer (RTE):** The SAFe Release Train Engineer provided critical insights into the implementation of the SAFe framework, coordination across Agile teams, and the management of dependencies and risks. This interview helped to understand the operational intricacies and the role of SAFe in scaling Agile practices across the department.
- **Offline review of reports and dashboards:** A thorough review of various reports and dashboards was conducted to extract key insights and performance indicators (KPIs). This analysis provided quantitative data to support the qualitative information gathered during the interviews, offering a balanced view of the department's performance before and after the transformation.
- **Offline review of process flows and backlog in Atlassian Jira:** Process flows and backlog items in Atlassian Jira were analyzed to understand the workflow, task prioritization, and progress tracking within the department. This review offered a detailed view of the operational processes and how they evolved with the adoption of Scaled Agile practices.

4.1.3 Challenges that led to the Scaled Agile transformation

The need for a Scaled Agile transformation within the Digital Product Development department arose from several critical challenges that the company faced:

- **Inconsistent product availability and customization:** Some digital products were developed locally in specific nations due to the availability of specialized skills. However, these products often struggled to be customized for different client needs across other regions. Despite high interest from other markets, it proved difficult to adapt these products and ensure their ongoing evolution over time. As a result, some digital products were not consistently available across all geographies, limiting the company's ability to offer a unified portfolio of digital services globally. This inconsistency contributed to delays in bringing these products to new markets.
- **Lack of regular collaboration among product owners:** The only regular meeting that brought together product owners from different digital services was a quarterly session primarily focused on discussing financial results. This lack of frequent and structured collaboration hindered the ability to share insights, align strategies, and address common challenges across different markets. The absence of regular interaction among product owners was a significant barrier to fostering innovation and ensuring cohesive product development, which also led to delays in time to market as coordination issues slowed down the development process.
- **Diverse and uncoordinated Agile practices:** Different OpCos had adopted various Agile strategies, selecting different frameworks and customizing them without a unified global approach. For instance, Northern European markets initially adopted the Spotify framework, while Central and Southern European countries implemented Scrum for the application layer and Kanban for infrastructure management. In contrast, APAC markets embraced SAFe during their later Agile adoption to support their internal Scaled Agile transformation. The lack of a consistent Agile methodology across the organization led to fragmented processes, making it difficult to achieve a streamlined and efficient

development cycle. This fragmentation further contributed to delays in bringing new products to the market.

- **Need for a structured product lifecycle management process:** There was a pressing need for a clear and structured product lifecycle management process that aligned financial and technical requirements across different markets. This process was essential for ensuring that digital products met both business objectives and technical standards while enabling efficient resource allocation and strategic planning across the organization. Without such a process, misalignments occurred, causing delays in the development and release of new products.

These challenges collectively contributed to delays in the time to market for new digital products. The inconsistent availability and customization of products, lack of regular collaboration among product owners, diverse and uncoordinated Agile practices, and the absence of a structured product lifecycle management process all created obstacles that slowed down the development and launch of new offerings. These delays risked undermining the company's competitiveness and its ability to meet the evolving needs of customers globally.

In response to these challenges, the company initiated a Scaled Agile transformation in 2021. This transformation unified the approach to digital product development across all markets. By implementing a consistent Agile framework, establishing regular collaboration among product owners, and creating a structured product lifecycle management process, the company enhanced its ability to deliver high-quality digital products quickly and efficiently across all geographies. This transformation streamlined operations and ensured that the company remained Agile and responsive in an increasingly competitive digital landscape.

4.1.4 Agile transformation KPIs

To accurately measure the performance of the Digital Product Development department before the Agile transformation, several strategic KPIs were defined. These key performance indicators provide a detailed view of efficiency, quality, and customer satisfaction, forming a solid foundation for comparing pre-transformation results with those following the transformation. These KPIs will be tracked not only before the transformation but also during and after the process to assess the effectiveness of the Agile transformation.

Average Time-to-Market (TTM): This KPI measures the average duration from product concept approval to market launch, providing insight into the speed of product development. The data is sourced from project timelines recorded in Jira and product launch dates from internal reports.

Number of unclear backlog items: This indicator represents the percentage of backlog items that are marked as unclear or needing refinement, reflecting the clarity and readiness of the product backlog. Data is gathered from Jira backlog analysis and feedback from sprint retrospectives.

Percentage of features approved after iterations: This KPI indicates the average percentage of proposed features that receive approval after one or more iterations, showcasing the effectiveness of the iterative development process. The data sources include feature approval logs from Jira and records from iteration reviews.

Number of defects per release: This metric tracks the average number of defects identified after a product release, highlighting the quality of the released products. The data is collected from defect logs in Jira and post-release quality assurance reports.

Customer satisfaction scores (CSAT): This KPI measures the average satisfaction rating from customer feedback, showing how well the product meets customer expectations. Data is sourced from customer feedback surveys and product-specific Net Promoter Score (NPS) data.

Sprint velocity (story points completed per sprint): This KPI represents the average number of story points completed per sprint, reflecting the productivity and efficiency of the development teams. The data comes from Jira sprint reports and team velocity charts.

Feature cycle time: This KPI measures the average time taken to complete a feature from the start to when it is ready for release, indicating the efficiency of feature development. Data sources include Jira and feature tracking logs.

Team collaboration index: Based on internal surveys, this KPI reflects the effectiveness of team collaboration and communication. The data is gathered from internal team surveys and notes from retrospective meetings.

Release frequency: This KPI tracks the number of major product releases per year, indicating the pace of product delivery. The data is sourced from release schedules and product roadmap documentation.

Product quality index (PQI): This composite KPI assesses product quality based on defect rates, customer feedback, and post-release support tickets. The data is collected from quality assurance reports, customer feedback, and support logs.

The following values represent the baseline performance indicators recorded before the start of the Agile transformation, establishing a reference point to assess subsequent progress (Table 5).

KPI	B2B services	B2C services
Average Time-to-Market (days)	125	135
Number of Unclear Backlog Items (%)	17%	19%
Features Approved After Iterations (%)	76%	72%
Defects per Release	15	17
Customer Satisfaction Score (CSAT)	3.6	3.3
Sprint Velocity (Story Points/Sprint)	38	32
Feature Cycle Time (days)	34	39
Team Collaboration Index (1-5)	3.2	2.9
Release Frequency (Releases/Year)	4	3
Product Quality Index (PQI, 0-100)	73	68

Table 5 - KPIs before the implementation of the Agile project

4.2 Scaled Agile operating model

To optimize key performance indicators (KPIs) and gain a competitive advantage, the telecom operator has implemented a new operating model focused on a Scaled Agile transformation.

This transformation is structured around seven strategic pillars, each of which plays a crucial role in enhancing efficiency, responsiveness, and customer-centricity within the Digital Product Development department (Figure 53):

- **New ways of working:** The Scaled Agile Framework (SAFe) is central to the operating model, promoting agility, collaboration, and the ability to quickly adapt to market changes.
- **Product portfolio segmentation:** The operating model categorizes products into types A, B, and C, enabling tailored strategies that meet specific market and customer needs.
- **Product Lifecycle Management (PLCM):** The model includes a standardized set of lifecycle stages such as Strategy, Planning, Agile Development, Go to Market (GTM) readiness, Launch, In Life, and End of Life, ensuring consistent product delivery and continuous improvement.

- **Product management roles:** Clearly defined roles are embedded in the operating model, ensuring effective management across all product types and stages, with clear accountability at every level.
- **Financial management:** A transparent, data-driven budgeting process is part of the operating model, ensuring financial resources are allocated efficiently and in alignment with strategic priorities.
- **Organizational considerations:** The operating model emphasizes a customer and product-centric structure, with a shared vision and aligned goals across the organization to ensure coherence and focus.
- **Global product board:** The global product board is integral to the operating model, providing governance and ensuring alignment of the product portfolio with the company’s overall strategic direction.

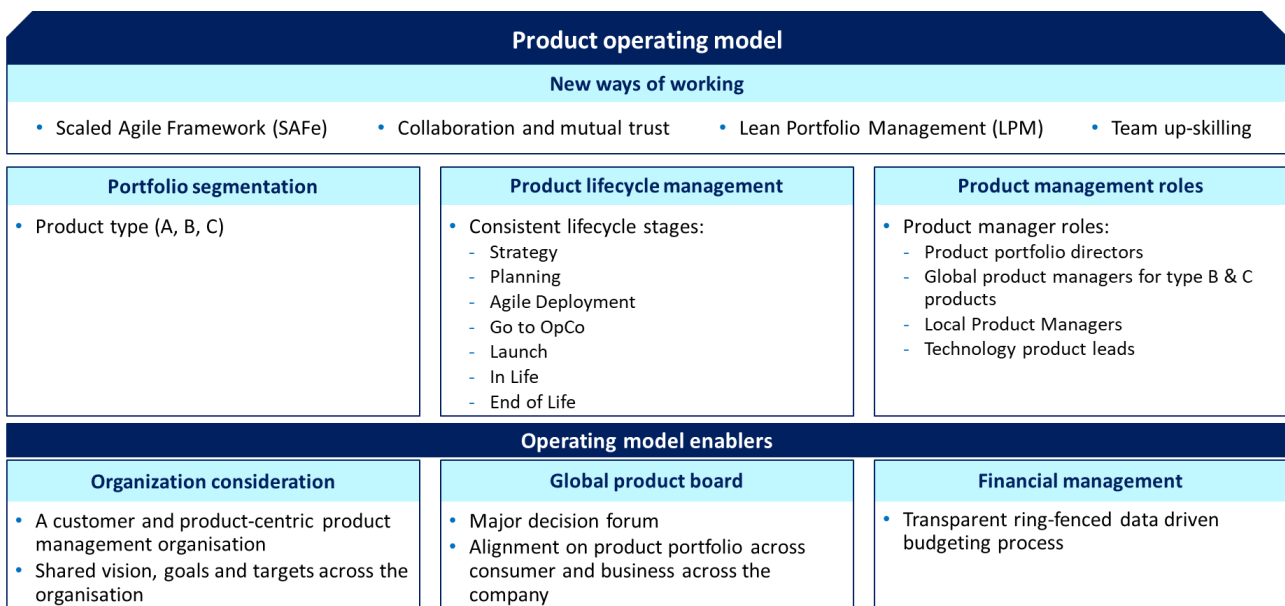


Figure 53 - New product operating model: 7 core pillars

4.2.1 Agile Transformation Architecture

To address the growing complexity of product delivery across both consumer (CP&S) and enterprise (EP&S) domains, a large-scale Agile transformation programme was launched, targeting not only ways of working but also structural, process, and governance foundations. Rather than focusing solely on Agile team-level practices, the initiative was designed to create a **comprehensive product operating model**, ensuring scalability, alignment, and cross-functional integration across regions and portfolio types.

The transformation was built around **four interdependent pillars**, each representing a foundational enabler of the target operating model:

- **Organization & skills** ensured the consistent definition of product roles, capabilities, and career paths to support scalable team structures.
- **Product Lifecycle Management (PLCM)** provided a harmonized view of how products are defined, developed, evolved, and retired, critical for both financial traceability and cross-market reusability.
- **SAFe implementation** introduced a unified Agile framework across teams, ensuring consistent delivery methods and synchronized planning cycles through Lean Portfolio Management (LPM).

- **Governance & finance** institutionalized global oversight mechanisms, standardized budget ownership, and ensured investment discipline across portfolios.

These pillars were not siloed initiatives; rather, they were tightly coupled and mutually reinforcing. The SAFe framework required clearly defined product roles and governance (enabled by Organization & Skills and Governance & Finance), while the PLCM framework offered the backbone for managing scope and value flow across Agile delivery structures.

To manage the rollout effectively, the implementation followed a wave-based approach across geographies and portfolios. Each wave progressively expanded the scope of the model and deepened maturity across the four pillars (Table 6).

	Wave 1	Wave 2	Wave 3
Organization and skills	<ul style="list-style-type: none"> • Deployment of the Product Operating Model (POM) to Enterprise Product & Services (EP&S) Wave 1 teams • Deployment of the POM to all Consumer Product & Services (CP&S) portfolios within the EU4 region • Definition of a unified product manager skills framework • Agreement on a long-term talent development strategy 	<ul style="list-style-type: none"> • Extension of the POM to all remaining EP&S portfolios in the EU4 region • Rollout of the POM to CP&S portfolios in the EU Cluster • Adoption of the POM in TV product lines across EU4 and EU Cluster 	<ul style="list-style-type: none"> • Full deployment of the POM across all EP&S portfolios in the EU Cluster • Completion of POM rollout to all CP&S portfolios in the EU Cluster and other regions
Product Lifecycle Management (PLCM)	<ul style="list-style-type: none"> • Definition and agreement on a standard product portfolio taxonomy for EP&S and CP&S • Formalization of Level 2 PLCM processes • Definition of decision-making responsibilities using RAPID 	<ul style="list-style-type: none"> • Drafting and validation of Level 3 and Level 4 PLCM processes • Design and formal approval of a PLCM pilot • Launch of initial tooling assessments to support lifecycle process implementation 	<ul style="list-style-type: none"> • Execution of a PLCM pilot on an end-to-end Internet of Things (IoT) portfolio • Walkthrough sessions held with CP&S product teams to validate implementation • Final agreement on the strategy for organization-wide PLCM rollout
SAFe implementation	<ul style="list-style-type: none"> • Launch of training programs for pilot Agile teams under the Scaled Agile Framework (SAFe) • Coaching support provided to five initial EP&S and CP&S teams • Introduction of Lean Portfolio Management (LPM) concepts 	<ul style="list-style-type: none"> • Transition of Wave 1 Agile teams to Business-As-Usual (BAU) mode • Definition of the rollout scope and execution model for Wave 2 teams • Delivery of a Minimum Viable Product (MVP) version of the Lean Portfolio Management framework for next fiscal year planning 	<ul style="list-style-type: none"> • Training and onboarding of Wave 2 teams into SAFe • Piloting of a complete value stream structure across both EP&S and CP&S domains
Governance and finance	<ul style="list-style-type: none"> • Introduction of the Global Product Board (GPB) • Ringfencing product budgets for EP&S and CP&S portfolios 	<ul style="list-style-type: none"> • Onboarding of all CP&S and EP&S portfolios into the GPB governance model 	<ul style="list-style-type: none"> • Finalization and documentation of the complete governance framework for the Product Operating Model (POM)

Table 6 - Agile transformation waves

4.2.2 New way of working- SAFe Agile implementation

To address its specific business requirements and effectively manage increasing complexity due to evolving market demands, the telecommunications operator decided to adopt a structured approach to Agile delivery by selecting the Scaled Agile Framework (SAFe). At the time of implementation, the operator identified SAFe version 6.0 as the most advanced and comprehensive available, capable of providing a robust structure for scaling Agile practices across large and diversified organizations [63]. After careful evaluation of available SAFe configurations, the telecom operator specifically opted for the SAFe Portfolio configuration, aiming to achieve an integrated and coherent approach to Agile transformation (Figure 54). This decision was driven by the need to fully harmonize and streamline delivery processes, covering both business B2B (Enterprise Product & Services) and B2C (Consumer Product & Services) segments. This comprehensive adoption of SAFe Portfolio allowed the operator to systematically manage Agile initiatives across multiple organizational levels, from tactical execution to strategic governance.

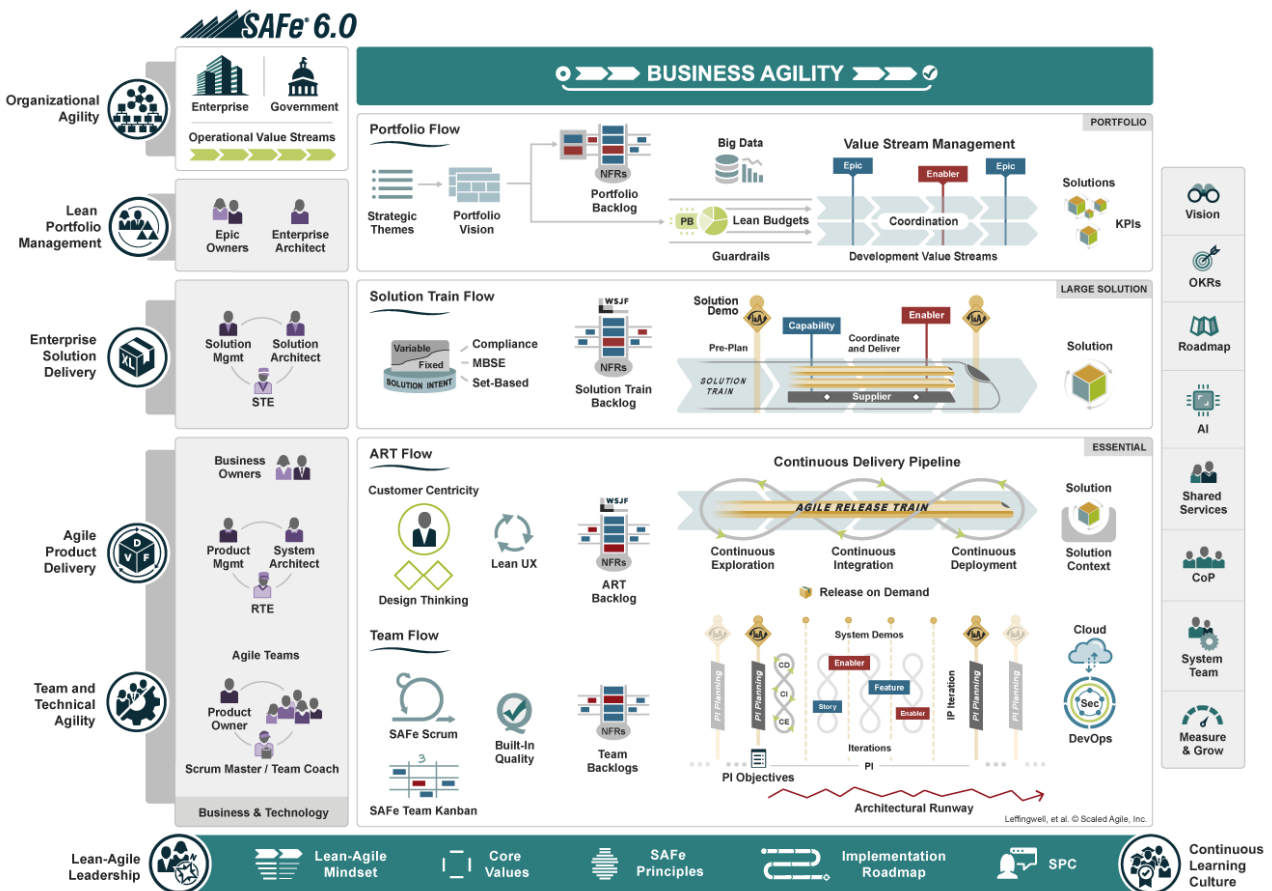


Figure 54 - SAFe 6.0 framework ©

The SAFe Portfolio configuration selected by the telecom operator consists of three clearly defined levels:

- Essential SAFe:** Essential SAFe represents the foundational layer of the SAFe framework, addressing Agile implementation at the team and program levels. It organizes Agile Teams into Agile Release Trains (ARTs), which are long-lived teams of Agile teams synchronized around a common technological or business objective. Key roles at this level include Scrum Masters, Product Owners, Agile Teams, and the Release Train Engineer (RTE), who coordinates delivery across multiple teams. Essential SAFe employs Agile methodologies such as Scrum, Kanban, and Extreme Programming (XP), alongside DevOps practices including Continuous Integration and Continuous Delivery (CI/CD). Central to Essential SAFe are core ceremonies such as Program Increment (PI) Planning, Iteration

Planning, Daily Stand-ups, Iteration Reviews, Iteration Retrospectives, and the Inspect & Adapt event, all designed to maximize alignment, efficiency, and quality of delivery

- **Large Solution SAFe:** Large Solution SAFe extends the Essential SAFe level, focusing on managing large and complex solutions involving multiple Agile Release Trains. It introduces the Solution Train, a construct used to coordinate and synchronize the efforts of several ARTs working together on comprehensive and sophisticated solutions. Critical roles added at this level include the Solution Train Engineer (STE), Solution Architects/Engineering teams, and Solution Management, responsible for cross-ART alignment and architectural coherence. Large Solution SAFe features additional synchronization events such as Pre- and Post-PI Planning sessions and Solution Demos, ensuring continuous validation of integrated solutions. It also incorporates Lean-Agile budgeting, economic prioritization, and governance practices specifically designed to support complex, cross-team initiatives
- **Portfolio SAFe:** Portfolio SAFe provides the highest strategic layer, enabling enterprise-level agility and alignment of strategy with execution across multiple Solution Trains and ARTs. At this level, Lean Portfolio Management (LPM) plays a pivotal role, guiding strategy definition, budgeting, and resource allocation at the enterprise scale. Additional key roles at the Portfolio level include Enterprise Architects and Epic Owners, managing strategic initiatives called Epics through the Portfolio Kanban system. Portfolio SAFe emphasizes strategic governance, investment funding processes, and value stream alignment, ensuring all Agile efforts across the organization clearly map to overarching business goals and enterprise strategy

4.2.2.1 Components Activated within the SAFe Portfolio Configuration

In adopting the SAFe Portfolio configuration, the telecom operator activated a comprehensive set of interconnected components aimed at aligning strategic planning, operational execution, and financial governance within an integrated Agile management framework. These components were chosen explicitly to enhance business agility and optimize value delivery across the full organizational spectrum, from strategic visioning to operational execution.

- **Portfolio vision:** The Portfolio Vision component serves as the primary strategic articulation of long-term organizational objectives and aspirations. Developed collaboratively among senior leadership and key stakeholders, this vision provides essential guidance and contextual alignment for Agile teams and value streams, facilitating coherent decision-making and prioritization. The vision, underpinned by principles of divergent and convergent thinking, is simultaneously aspirational, realistic, motivational, and operationally practical. This strategic clarity is essential for guiding the subsequent definition and prioritization of portfolio initiatives, ensuring that Agile teams maintain alignment with overarching business objectives and strategic imperatives.
- **Portfolio canvas:** To operationalize the Portfolio Vision effectively, the Portfolio Canvas was utilized as a structured instrument derived from Osterwalder's Business Model Canvas. It explicitly defines and visualizes Development Value Streams (DVS) within the portfolio, outlining key elements including customer segments, value propositions, critical activities and resources, channels, partner networks, and comprehensive financial dimensions (cost structures and revenue streams). This structured approach facilitates strategic transparency and alignment by systematically mapping the interactions and dependencies among business stakeholders, resources, and Agile delivery mechanisms. Additionally, it serves as a strategic reference for the assessment and continuous refinement of portfolio-level initiatives and solutions

- Development Value Streams (DVS):** A critical component activated under SAFe Portfolio configuration, Development Value Streams encapsulate all requisite activities, processes, personnel, and technological assets required to convert strategic business hypotheses into deployable digital solutions. The DVS construct is integrally linked to Operational Value Streams (OVS), the organizational processes delivering customer-facing value, and is carefully designed to reflect and optimize the end-to-end value delivery lifecycle. Employing Continuous Delivery Pipelines comprising Continuous Exploration, Continuous Integration, Continuous Deployment, and Release-on-Demand capabilities, DVS enable accelerated flow, enhanced adaptability, and responsive delivery of value. Moreover, Development Value Streams are instrumented with Key Performance Indicators (KPIs), allowing rigorous assessment and continuous optimization, thus reinforcing alignment with enterprise strategic objectives.
- Lean budgets and Participatory Budgeting (PB):** The telecom operator's implementation included advanced financial governance mechanisms embodied within the Lean Budgeting framework, signifying a strategic shift away from traditional project-centric budgeting practices. In alignment with Lean-Agile principles, Lean Budgets allocate financial resources directly to value streams rather than discrete projects, thereby enabling sustained agility, flexibility in decision-making, and long-term operational continuity. Complementary Lean Guardrails were instituted to provide clear strategic and operational guidelines, encompassing investment horizons, capacity allocation policies, and continuous stakeholder engagement processes. Furthermore, Participatory Budgeting was explicitly adopted to facilitate collaborative budget allocation processes, managed by Lean Portfolio Management (LPM). PB practices entail structured interactions involving preparation and dissemination of contextual information, comprehensive stakeholder engagement, transparent deliberation forums, and systematic analysis of outcomes to establish investment priorities. This collective, transparent budgeting mechanism ensures financial alignment with evolving strategic priorities and fosters stakeholder consensus, ultimately enhancing strategic responsiveness and resource optimization across the portfolio.
- Core competencies and key roles:** Within the SAFe Portfolio configuration, the operator activated specific core competencies and key organizational roles essential for successful implementation. The core competencies include Organizational Agility, emphasizing structural adaptability and rapid response to environmental changes; Lean Portfolio Management, focused on evolving strategic alignment and value-driven investment decisions; and Continuous Learning Culture, fostering ongoing innovation, experimentation, and knowledge dissemination across teams and organizational units. Correspondingly, critical roles activated include Lean Portfolio Management personnel, accountable for portfolio governance, strategic alignment, and investment decisions; Enterprise Architects, responsible for technical alignment and integration of enterprise-level architectures; and Epic Owners, tasked with managing strategic initiatives (Epics), ensuring clarity in articulation, rigorous prioritization, and alignment with portfolio objectives. Collectively, the activation of these components within the SAFe Portfolio configuration provided the telecom operator with a structured, strategically aligned, and operationally effective framework, capable of delivering sustained business agility, financial efficiency, and organizational coherence at scale.

4.2.3 Product portfolio segmentation

As part of the operating model transformation, a structured product categorization framework was introduced to better align strategic management approaches with the nature and maturity of the product

portfolio. This framework classifies all digital products into three types based on their operating model, market scope, lifecycle stage, and contribution to current revenue.

This classification enables the organization to adopt tailored governance, investment, and delivery strategies for each category, rather than applying a one-size-fits-all approach. Type A products are typically well-established offerings governed locally within individual markets. In contrast, Type B and Type C products are centrally managed at the global level and are designed to scale across multiple markets, though they differ significantly in terms of maturity and strategic intent.

- **Type A** products constitute the foundation of the current business, accounting for the majority of revenue, but are often approaching saturation or decline in market penetration.
- **Type B** products enhance and extend the value of Type A portfolios, typically through converged or value-added services, and are in active growth phases.
- **Type C** products represent innovation-driven offerings aimed at opening new revenue streams or supporting disruptive service models; these are often in early-stage development and experimentation.

This typology not only informs product lifecycle management and investment prioritization but also supports differentiated operating models, enabling both agility and scale (Table 7):

	Type A – Locally Managed Products	Type B – Globally Managed Core Enhancements	Type C – Globally Managed Emerging Offerings
List of services	<ul style="list-style-type: none"> • Mobile and fixed tariff plans • Unlimited propositions • Fiber propositions • One Net Core Voice • Fiber / ADSL • Security services for connectivity 	<ul style="list-style-type: none"> • Super Wi-Fi • TV (streaming) • Content bundles • Security services (Secure Net) • SD-WAN • OneNumber • Unity / collaboration suites 	<ul style="list-style-type: none"> • Mobile money transfer • Home security • API commercialization • IoT E2E solutions • IoT trackers (People / Bikes) • Mobius (enterprise security)
Features	Single-market products	Multi-market products	Multi-market products
	Products mature / declining	Product in growth phase	Product in early growth stage
	Current revenue share: 80%	Current revenue share: 15%	Current revenue share: 5%

Table 7 - Product portfolio segmentation

4.2.4 Product lifecycle management process (PLCM)

The SAFe framework implemented by the telecom operator was tailored to establish a structured and integrated Product Lifecycle Management (PLCM) Process. This customized PLCM approach comprehensively manages the complete portfolio of products at a strategic level, while simultaneously guiding each product through its entire lifecycle, from initial ideation to eventual retirement. The process is fully aligned with SAFe principles, methodologies, and roles.

The PLCM process is underpinned by the Scaled Agile Framework with the explicit objective of enabling enterprise-wide business agility through the application of proven principles, disciplined practices, and core competencies.

At the product level, stakeholders operate across all lifecycle stages, including Strategy, Planning, Agile Development, Local Readiness, Launch, In-Life, and End-of-Life. Each stage consists of defined activities executed in an Agile and iterative manner. Feedback loops are integrated into each stage to allow continuous learning and adaptive decision-making. For instance, Planning incorporates inputs from Agile Development regarding epic refinement and delivery, from Local Readiness on market-specific preparedness, from Launch on go-to-market feedback, from In-Life on product performance and issue resolution, and from End-of-Life to assess simplification or retirement needs.

At the portfolio level, stakeholders engage across the same lifecycle stages, ensuring strategic coherence and operational alignment between the overall portfolio and individual product trajectories. Each portfolio stage also includes feedback mechanisms to enable dynamic adjustments. A continuous two-way interaction between product and portfolio levels reinforces alignment, governance, and delivery agility (Figure 55). The Global Product Board holds responsibility for global product strategy and high-level governance and interacts primarily at the portfolio level to ensure that enterprise goals are translated into actionable product decisions.

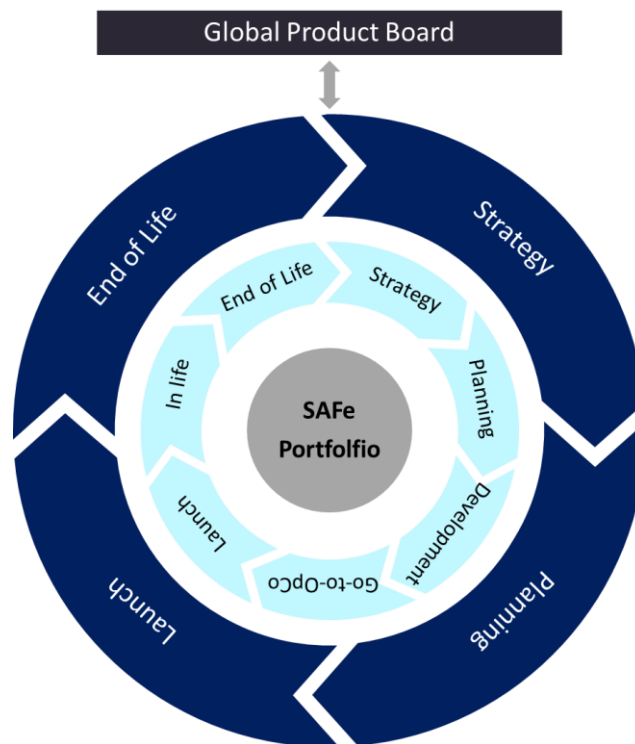


Figure 55 - Product lifecycle management operating model

4.2.4.1 PLCM- Portfolio Level

At the Portfolio level, the PLCM process vertically encompasses four primary phases: **Strategy**, **Planning**, **In-Life**, and **End-of-Life**. Each phase integrates activities aligned with SAFe's Lean Portfolio Management (LPM), Portfolio Vision, and governance mechanisms:

Strategy

- Formulation and continuous refinement of Portfolio Vision, explicitly aligning long-term product portfolio goals with enterprise strategic direction
- Prioritization and selection of strategic initiatives (Epics), leveraging market insights, emerging technological opportunities, and competitive analysis

- Strategic alignment and optimization of Development Value Streams (DVS), anticipating market evolution and customer expectations

Planning

- Resource allocation via Lean Budgeting mechanisms, funding prioritized value streams rather than discrete projects to enhance flexibility and responsiveness
- Collaborative investment decisions facilitated through Participatory Budgeting, engaging stakeholders in transparent prioritization and alignment activities
- Detailed Portfolio Canvas planning, explicitly mapping product value propositions, targeted market segments, resources required, and projected financial outcomes

In-Life

- Continuous performance tracking of in-market products, leveraging portfolio-level KPIs and metrics aligned to SAFe's continuous monitoring practices
- Regular assessments of product-market fit and strategic alignment, adjusting priorities dynamically based on ongoing financial and operational reviews
- Adaptive governance based on Lean Guardrails, enabling informed decision-making and Agile resource reallocation to sustain portfolio value optimization

End-of-Life

- Strategic decisions for product retirement based on comprehensive economic and strategic analyses, assessing profitability decline, market maturity, or evolving customer needs
- Controlled withdrawal from markets, including systematic management of customer transitions, contractual obligations, and clear communication plans
- Effective redeployment of resources towards emerging initiatives and strategic growth areas, informed by insights from retired products

4.2.4.2 PLCM- Product Level

At the individual product level, the PLCM process spans six clearly defined lifecycle stages: **Strategy, Planning, Agile Development, Go-to-OpCo, In-Life, and End-of-Life**. Each phase includes structured, SAFe-aligned activities ensuring disciplined progression from initial ideation through full market operation and eventual retirement:

Strategy

- Identification and assessment of customer needs, emerging market opportunities, and competitive positioning, utilizing SAFe's Continuous Exploration practices
- Alignment of individual product strategy with the overall Portfolio Vision and Lean Portfolio Management directives
- Economic feasibility analysis and preparation of Lean Business Cases, providing early visibility on strategic alignment, market potential, and resource implications

Planning

- Detailed product definition and feature prioritization using Agile methodologies, with clear backlog management facilitated by Product Managers and Product Owners
- Iterative and incremental planning leveraging SAFe Program Increment (PI) Planning events, ensuring clear product delivery timelines, resource assignments, and dependency management
- Application of Weighted Shortest Job First (WSJF) prioritization, enabling rapid value realization and efficient allocation of development resources

Development

- Implementation of product increments via Agile Teams organized within Agile Release Trains (ARTs), employing iterative methodologies including Scrum, Kanban, XP practices, and DevOps integration
- Regular execution of synchronization and alignment ceremonies such as Iteration Planning, Daily Stand-ups, Iteration Reviews, System Demos, and Inspect & Adapt workshops
- Continuous Integration (CI), Continuous Deployment (CD), and systematic solution integration led by Solution Architects and System Teams, guaranteeing adherence to architecture standards, product quality, and rapid time-to-market delivery

Go-to-OpCo

- Structured product handover and deployment into operational companies (OpCos), ensuring operational readiness, market-specific adaptations, and alignment with regional requirements
- Operational validation, including User Acceptance Testing (UAT), pre-launch compliance checks, and integration into existing local infrastructures and processes
- Collaborative engagement between global Product Management, local OpCo representatives, and Agile teams, ensuring seamless transition, training, support readiness, and final deployment acceptance

In-Life

- Continuous monitoring and optimization of product performance through real-time analytics, customer feedback loops, and operational KPIs aligned with SAFe Continuous Delivery practices
- Agile enhancement and maintenance activities addressing emerging market demands, feature improvements, and competitive dynamics, ensuring sustained customer satisfaction and product relevance
- Periodic updates, deployments, and operational tuning facilitated by Agile Teams and ARTs, maintaining ongoing product alignment with strategic market positioning

End-of-Life

- Structured product retirement planning, encompassing customer migration strategies, operational wind-down management, and clear internal and external communication protocols
- Execution of customer transitions, contractual closures, and controlled decommissioning of product operations, managed collaboratively by Product Management, Agile Teams, and relevant stakeholders

- Systematic knowledge capture, lessons learned analysis, and reallocation of resources towards strategic innovation and future product developments

4.2.4.3 SAFe integration in product lifecycle management process

The adoption of the SAFe Portfolio configuration required a fundamental redesign of the Product Lifecycle Management (PLCM) process so that it could operate on a cadence-based, empirically driven model. The resulting framework establishes two tightly coupled iteration cycles that govern early-stage formulation and mid-stage execution readiness, respectively, and it embeds explicit feedback conduits that transmit performance information from downstream phases to upstream decision domains (Figure 56).

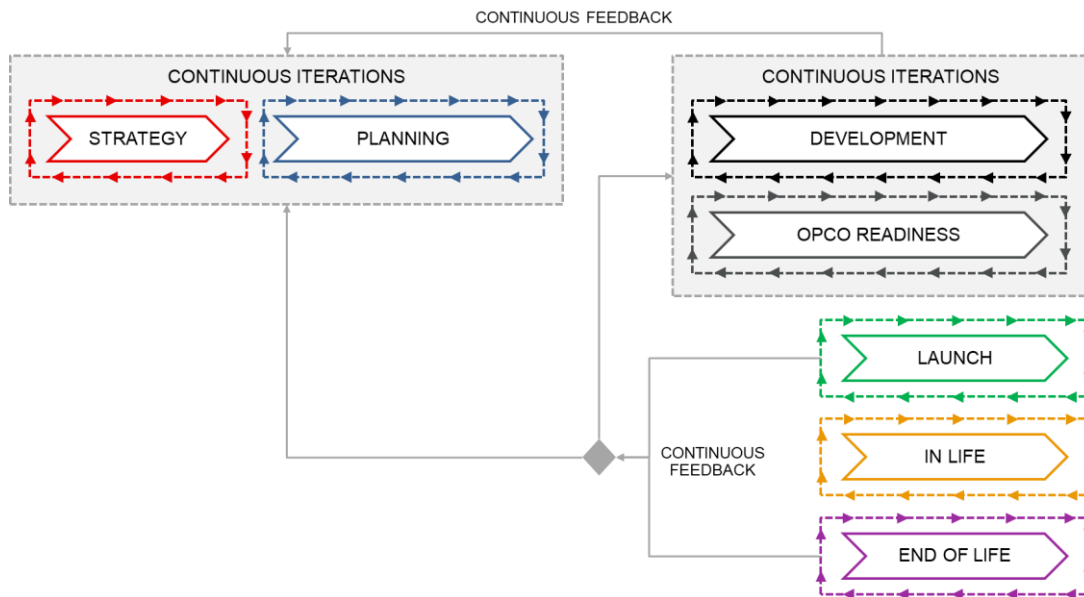


Figure 56 - PLCM updated to implement SAFe cadence approach

The first iteration cycle encompasses Strategy and Planning. Strategic analysis, value hypothesis definition, and investment horizon selection proceed in iterative increments rather than in a single linear pass. Each iteration evaluates market dynamics, technological inflection points, and capacity constraints, feeding those insights into an adaptive planning increment. Portfolio governance reviews the increment at predefined cadence boundaries, authorizing only those work packages that satisfy demonstrable value and alignment criteria. This structure reduces lead time between emergent opportunity identification and actionable backlog formation, thereby improving portfolio responsiveness and capital efficiency.

The second iteration cycle concentrates on Development and OpCo Readiness. Development advances through time-boxed Agile Release Train increments, while OpCo Readiness activities such as legal compliance checks, localization, channel enablement, and operational onboarding progress concurrently. A shared cadence gate synchronizes these efforts, ensuring that readiness artefacts evolve at the same rhythm as product increments. Early detection of localization impediments or regulatory gaps within this loop prevents late-stage rework and mitigates launch slippage risk.

Downstream lifecycle phases generate dedicated feedback streams that flow into both iteration cycles. Launch supplies market validation metrics such as adoption velocity and early revenue signaling. These metrics refine strategic hypotheses and may prioritize backlog items for subsequent increments. In-life operations contribute longitudinal performance data on reliability, customer satisfaction, and cost-to-serve, enabling continuous economic evaluation and guiding optimisation investments. End-of-life delivers decommission economics, asset reuse intelligence, and knowledge artefacts that inform future product ideation and strategic capital allocation.

The bidirectional nature of these interactions yields several systemic benefits. Iterative coupling of Strategy and Planning accelerates convergence on economically sound investment decisions. Parallel iteration of Development with OpCo Readiness preserves cadence integrity while accommodating regional differentiation. Continuous feedback from post-launch stages furnishes empirical evidence that sustains adaptive planning, reduces sunk-cost bias, and increases the overall resilience of the product portfolio. Collectively, these mechanisms align execution with strategic intent, shorten decision latency, and embed a learning architecture that perpetually recalibrates the enterprise toward optimal value delivery.

Global development and local integrations

The revised Product Lifecycle Management process introduces a dual-track execution model in which global development and local integrations proceed in parallel under a common cadence. Strategy definition initiates at the corporate level, where a unified product concept is articulated together with the overarching value hypothesis. Planning then refines this concept into a detailed blueprint that aligns global architectural intent with anticipated localization requirements. During this stage, global and local stakeholders jointly identify functional and regulatory gaps so that market-specific epics can be scoped alongside the global backlog rather than appended later as exceptions.

Global and local Agile Development activities commence simultaneously once the consolidated backlog has been prioritized. The global stream focuses on core platform capabilities, shared services, and reusable reference implementations, whereas each OpCo executes complementary work to accommodate regulatory obligations, language support, pricing logic, or partner integrations. Synchronization occurs at predefined cadence boundaries, where a readiness assessment evaluates the combined increment against both global quality criteria and local deployment prerequisites. This coordinated approach eliminates the latent queue time that arises when localization follows the global release and reduces duplicate effort by enabling early reuse of artefacts across markets (Figure 57).

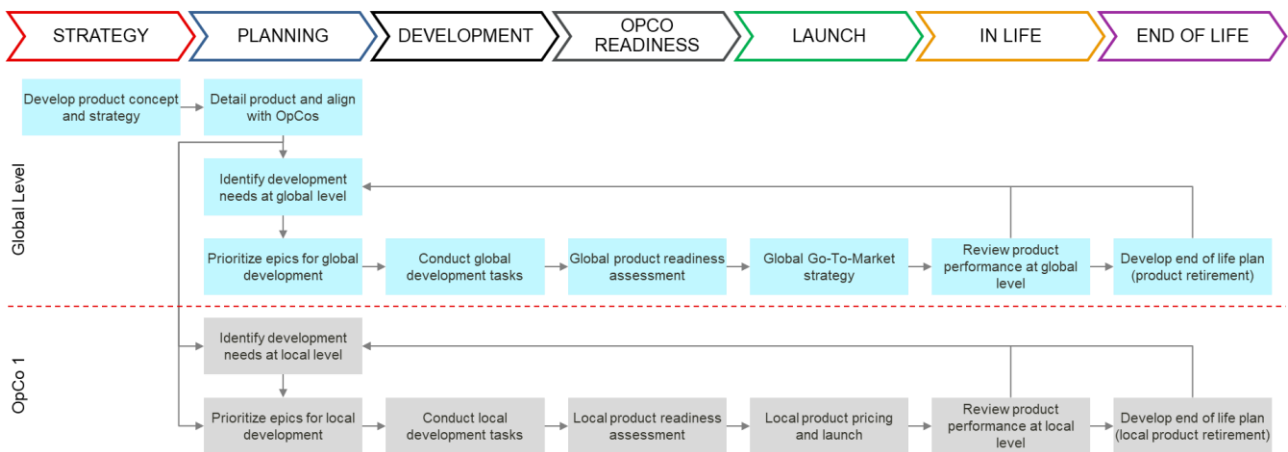


Figure 57 - Global development and local integrations

OpCo Readiness proceeds in the lockstep with engineering iterations. Cross-functional teams validate operational runbooks, conduct compliance audits, and finalize go-to-market materials while development remains in flight. Incremental readiness reviews surface localization impediments early, allowing rapid backlog adjustments without disrupting the global release schedule. Once the shared increment meets the readiness gate, each market executes launch activities that include pricing configuration, channel enablement, and customer onboarding while adhering to the shared brand framework.

In-life operation collects telemetry on performance, adoption, and cost-to-serve at both global and local layers. These data feed directly into the planning backlog so that capacity allocation, epic prioritisation, and technical debt remediation remain evidence based. End-of-life planning is initiated when either global

platform evolution or OpCo saturation triggers diminishing returns. The decommission strategy is crafted jointly to maximise asset reuse and to minimise residual risk, and the lessons captured inform subsequent strategic cycles.

This parallel operating model delivers three principal benefits. First, it compresses time to market by removing the serial dependency between core development and localization. Second, it elevates consistency, because local adaptations are engineered against the same architectural baselines and quality gates used by the global stream. Third, it strengthens financial governance, since investment decisions are supported by integrated performance telemetry that reflects both aggregate and market-specific outcomes.

Lean portfolio management and PLCM interlock

Lean Portfolio Management and the Product Lifecycle Management framework operate as a single governance mechanism that integrates capital planning, strategic alignment and incremental delivery. The combined model begins with a strategic refresh that revisits the three- to five-year portfolio vision, investment profile and objectives at six-month intervals. Outputs from this horizon scanning exercise feed an eighteen-month rolling plan and an updated portfolio business model canvas; both artefacts undergo concurrent six-month reviews to ensure sustained relevance considering market and technological shifts (Figure 58).

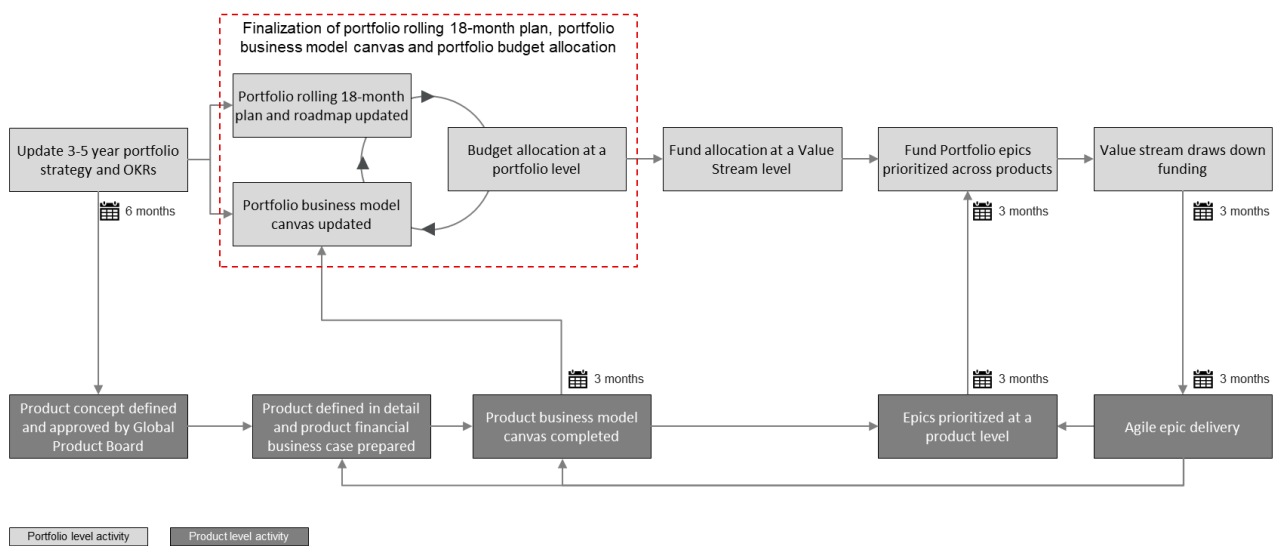


Figure 58 - Lean Portfolio Management and PLCM interlock

Financial governance is embedded directly in the planning cadence. Budget allocation is finalized at the portfolio layer immediately after the rolling plan is updated, linking funding decisions to the most current strategic information. Resources are then assigned to value streams, establishing clear financial boundaries for downstream work. The Lean Portfolio Office monitors these allocations and triggers corrective actions when actual burn rates deviate from planned investment envelopes.

Portfolio epics are prioritized across all products every three months, creating a synchronized decision point that balances strategic imperatives against capacity constraints. Value streams can draw down funds from their allocated budgets only after the cross-portfolio prioritisation cycle confirms the position of each epic in the sequencing matrix. This rule prevents local optimisation and maintains alignment with enterprise-level intent.

At the product layer, concept definition proceeds once the Global Product Board or Portfolio Head has validated strategic fit. A detailed design phase follows, culminating in a product financial business case that is reviewed on the same quarterly rhythm as the portfolio epic cycle. Completion of the business model

canvas marks the transition from conceptual exploration to committed delivery. Product epics are then defined, sized and prioritized, again on a three-month cadence, so that backlog sequencing remains harmonized with the broader portfolio roadmap.

Agile epic delivery executes within the value stream funding envelope. Each delivery increment is reviewed quarterly to assess budget adherence, technical progress and realized value. Findings are channeled back to the Lean Portfolio Office, the Portfolio Head and the relevant product leadership, allowing empirical data to inform the next budgeting and prioritisation cycle.

Inter-role collaboration underpins every activity. Portfolio Heads lead strategic refresh and capital allocation. Product managers translate strategy into product artefacts and collaborate with technology directors to validate feasibility and architectural integrity. The Lean Portfolio Office provides financial stewardship and cadence facilitation, ensuring that each review point yields actionable data for both strategic and operational steering.

This integrated structure delivers continuous alignment between long-term vision, mid-term financial planning and short-term execution. It accelerates funding decisions, reduces portfolio drift and embeds empirical learning into every planning horizon, thereby maximizing the probability that capital investment converts into sustainable product value.

4.2.5 Product management roles

The implementation of the SAFe framework, together with the establishment of a structured Product Lifecycle Management (PLCM) process, required not only new workflows but also the definition of a dedicated set of product roles. These roles were designed to support the full spectrum of lifecycle activities across both the portfolio and product levels, ensuring clear accountability, strategic alignment, and operational excellence.

This role model was constructed to reflect the organizational need for coordinated product ownership across multiple business units and geographies. In particular, the introduction of Global Product Managers for Type B and Type C products responded to two key factors: the international footprint of these offerings across several OpCos and the growing demand for consistent cross-market delivery, architectural harmonization, and go-to-market alignment.

Product portfolio directors

Product Portfolio Directors operate at the strategic portfolio layer and are responsible for the end-to-end governance of product families or thematic domains. Their scope includes strategic alignment, funding, and lifecycle management. Core responsibilities include:

- Leading the definition and ongoing refinement of the Portfolio Vision in partnership with Lean Portfolio Management
- Driving investment and prioritization decisions through participation in Portfolio Kanban and Participatory Budgeting processes
- Ensuring that all products within their remit align with enterprise strategy and architectural standards
- Supporting cross-functional coordination across Global Product Managers and Value Stream leadership

Global Product Managers for type B and type C products (GPM)

Global Product Managers focus on offerings deployed across multiple OpCos. These are typically Type B products, which require moderate local customization, and Type C products, which are fully standardized

across markets. These roles were introduced to address the operational complexity and strategic importance of managing global product lines. Responsibilities include:

- Defining the global strategy and roadmap of the product in alignment with portfolio priorities and enterprise goals
- Coordinating delivery and lifecycle execution across OpCos, balancing global efficiency with local needs
- Managing a shared backlog and prioritization process in collaboration with Agile Release Trains and local product teams
- Leading cross-market go-to-market planning, enablement activities, and market readiness coordination
- Monitoring global performance metrics and collecting feedback for continuous product evolution

Local Product Managers (LPM)

Local Product Managers are responsible for executing the product lifecycle within individual OpCos or national markets. They serve as the interface between global product strategy and local operational delivery. Their responsibilities include:

- Ensuring operational readiness and compliance for product launches in local contexts
- Coordinating with sales, support, and technical teams to ensure smooth deployment and integration
- Providing continuous feedback on product performance, customer satisfaction, and localization needs to global roles
- Managing in-life activities such as pricing, promotions, and issue resolution, as well as end-of-life planning where applicable

Technology Product Leads (TPL)

Technology Product Leads are accountable for the technical coherence, architectural integrity, and long-term sustainability of the product. They provide the engineering vision and technical guidance throughout the lifecycle. Key responsibilities include:

- Defining the product's technical roadmap in coordination with enterprise architecture and delivery teams
- Ensuring that all architectural decisions support scalability, maintainability, and security requirements
- Collaborating with Agile Teams and Release Train Engineers to implement technical enablers and manage dependencies
- Acting as the main technical counterpart to product managers, supporting delivery feasibility and integration readiness

Solution Train Product Leads (STPL)

Solution Train Product Leads are responsible for the coordination and strategic oversight of products developed and delivered within a Solution Train. Operating in contexts involving complex, multi-ART (Agile Release Train) delivery environments, STPLs ensure that product direction, technical dependencies, and cross-

ART alignment are consistently managed and executed at scale. They bridge the gap between product strategy and large solution execution, particularly in SAFe's Large Solution configuration. Key responsibilities include:

- Defining and maintaining alignment between the solution vision and the roadmaps of contributing Agile Release Trains, ensuring coherence across the product lifecycle
- Coordinating strategic epics and features that span multiple ARTs, working in close collaboration with Product Management, Solution Management, and Solution Architects
- Ensuring that dependencies, risks, and milestones across ARTs are identified, communicated, and managed proactively
- Facilitating synchronization ceremonies across trains, including Pre- and Post-PI Planning, and supporting Inspect & Adapt events at the Solution Train level
- Acting as a focal point for stakeholder communication regarding solution scope, roadmap status, and alignment to business objectives

4.2.6 Operating model enablers

The successful implementation of the SAFe-based Product Lifecycle Management (PLCM) process required the design and activation of a coherent set of Operating Model Enablers. These enablers ensure structural alignment, governance clarity, and financial viability across the product and portfolio ecosystem. They support decision-making, accountability, and operational fluidity throughout the lifecycle of both individual products and the broader portfolio. Three critical enablers were identified and institutionalized: Organization Consideration, Global Product Board, and Financial Management. Each plays a foundational role in ensuring that strategy translates into delivery, and that governance supports both autonomy and control.

Organization consideration

The new product operating model introduced distinct roles and responsibilities across multiple organizational layers, with a clear distinction between global and local product ownership. This role separation was essential to accommodate the complexity of operating in a multi-OpCo environment. The model ensures:

- Explicit allocation of end-to-end accountability for product lifecycle management, enabling clarity in ownership, faster decision-making, and improved responsiveness to market needs
- A clear separation of global responsibilities (standardization, cross-market coordination, global backlog ownership) from local execution (deployment readiness, customer engagement, regulatory alignment)

This structural approach supports scale without compromising local agility, enabling efficient governance of standardized, repeatable solutions while preserving flexibility for OpCo adaptation.

Global Product Board (GPB)

The Global Product Board functions as the principal governance body for product strategy at the portfolio level. It ensures alignment between enterprise objectives and product development, acting as the central forum for cross-functional and cross-market coordination. The Board's primary responsibilities include:

- Owning the global product strategy and setting the strategic direction for the entire portfolio
- Enforcing a product-centric operating model by anchoring strategic planning, funding decisions, and lifecycle oversight within a unified governance structure

The Board convenes key stakeholders across business, technology, and market-facing functions, fostering a shared view of priorities, dependencies, and execution paths across all stages of the PLCM process.

Financial management

Robust financial governance was introduced to enable funding models that reflect the Agile and iterative nature of the new operating model. Traditional project-based funding approaches were replaced by lean, product-centric financial mechanisms aligned with SAFe principles. The financial management model includes:

- Funding allocated at the product level rather than the project level, enabling long-term product ownership and accountability
- Budget ownership assigned to Global Product Managers, reinforcing their end-to-end responsibility and simplifying investment planning, tracking, and reforecasting

4.3 Scaled Agile transformation – Implementation waves and results

The implementation of the SAFe framework within the telecom operator's environment was designed to support the customization of the Product Lifecycle Management (PLCM) process through a structured and phased approach. The transformation was initiated with a Proof of Concept (PoC) phase, which served to validate core assumptions, test the applicability of SAFe to the operator's specific organizational and product context, and identify key enablers and constraints. Following the PoC, the rollout proceeded through three incremental implementation waves, each targeting distinct product families, operational domains, and OpCos. This staged deployment ensured controlled scaling, continuous feedback integration, and progressive capability building across global and local teams.

4.3.1 Transformation timeline

The transformation unfolded through a structured, multi-year programme that progressed from initial experimentation to full institutionalization of scaled Agile practices across the European footprint. The initiative formally began in 2021, when the organization recognized the need to unify digital product delivery, reduce fragmentation across markets and establish a coherent operating model supported by SAFe and an integrated Product Lifecycle Management framework. The programme lasted twenty-four months, followed by an additional six-month refinement phase aimed at consolidating lessons learned, stabilizing governance routines and finalizing the alignment between global and local delivery structures.

The first stage consisted of a Proof of Concept conducted in early 2021. This phase tested the applicability of the PLCM stages, validated interactions between global and local stakeholders and assessed readiness across both enterprise and consumer domains. It served as the foundation for prioritizing change enablers and addressing structural blockers before moving to large scale rollout.

- Wave 1, initiated immediately after the Proof of Concept and extending through the remainder of 2021, focused on deploying the Product Operating Model in selected enterprise and consumer portfolios, activating the SAFe Portfolio configuration in pilot teams and defining the initial set of PLCM processes. This wave marked the transition from conceptual validation to controlled implementation.
- Wave 2, spanning the first part of 2022, broadened the operating model to additional portfolios across the European cluster. During this period, more detailed PLCM processes were formalized, Lean Portfolio Management mechanisms were operationalized and the first complete value stream structures were tested. This phase represented the shift from isolated pilots to structured expansion.

- Wave 3, running through the second half of 2022, completed the adoption of the Product Operating Model across all enterprise and consumer portfolios in scope. Training activities, onboarding routines, cross functional alignment and full value stream execution were consolidated, while governance and financial guardrails reached operational maturity. By the end of this wave, the organization achieved full structural, procedural and governance alignment across regions.
- The subsequent refinement period, carried out in the first half of 2023, focused on adjusting the PLCM workflow, strengthening role clarity, completing tooling integration and harmonizing cadence and execution practices across all markets. This phase did not expand the operating model further but ensured its long term coherence, durability and full operational readiness.

This timeline demonstrates a progressive progression from exploratory validation to systemic scaling, culminating in the consolidation of a mature, enterprise wide Agile delivery ecosystem (Table 8).

Phase	Period	Key activities	Geographic scope
Proof of Concept	Early 2021	Validation of PLCM stages and SAFe applicability; assessment of roles and readiness; test and learn on enterprise and consumer domains	Selected markets in Europe
Wave 1	Mid 2021 to end 2021	Initial deployment of the Product Operating Model; activation of SAFe Portfolio for pilot teams; definition of level two PLCM processes	Enterprise and consumer portfolios in primary European group
Wave 2	First half of 2022	Expansion of the operating model; formalization of detailed PLCM processes; introduction of Lean Portfolio Management practices; first complete value stream structures	Additional enterprise and consumer portfolios across the European cluster
Wave 3	Second half of 2022	Full rollout of the Product Operating Model; consolidation of SAFe ceremonies; alignment of governance and financial guardrails; maturation of value streams	All enterprise and consumer portfolios in scope
Refinement phase	First half of 2023	Stabilization of processes; final alignment of roles and governance; completion of tooling integration; harmonization of cadences	Entire European footprint

Table 8 - Transformation timeline of the Scaled Agile programme

4.3.2 Proof of Concept phase

The initial Proof of Concept (PoC) phase marked a foundational step in the telecom operator’s implementation of the SAFe-aligned Product Lifecycle Management (PLCM) process. The PoC was structured to test the process across both Business and Consumer domains, specifically focusing on IoT end-to-end solutions and Type B products respectively. This dual-track setup enabled a comprehensive evaluation of the PLCM stages under different product conditions, organizational roles, and operational models.

In the Business domain, the PoC examined the execution of activities across each PLCM stage, the involvement and clarity of roles, and the applicability of RAPID matrices. Stakeholders including GPM, LPM, STPL, and TPL provided detailed feedback on the defined templates. A structured KPI gap analysis was conducted to distinguish between metrics that were already available and automated, those requiring

manual input, and those that could not currently be reported. In parallel, selected tooling use cases were tested in a controlled staging environment to assess feasibility and readiness for future implementation.

In the Consumer domain, the test and learn exercise focused on validating the overall PLCM flow in the context of Type B products. Feedback was gathered on the clarity and applicability of activities across all PLCM stages, helping to assess the suitability of the framework for less complex, standardized product categories (Table 9).

	Business	Consumer
Test and learn product scope	IoT E2E solutions	Type B products
Test and learn activity scope	<ul style="list-style-type: none"> Feedback on activities covered, stakeholders involved and RAPIDs for each stage of the PLCM process Template feedback for PLCM stages from GPM, LPM, STPL, TPL KPI gap analysis to assess automated, manual, and missing KPIs Test tooling use cases in a staging environment 	<ul style="list-style-type: none"> Feedback on activities covered for each stage of the PLCM process
Approach	<ul style="list-style-type: none"> Workshops with GPM, LPM, STPL, and TPL to review portfolio and product-level activities Offline review of RAPIDs for all activities across stages Offline review of templates defined for each stage In life testing of the process and templates for select stages 	<ul style="list-style-type: none"> Workshops with GPM, LPM, STPL, and TPL to review portfolio and product-level activities

Table 9 - PoC approach for business and consumer products

The approach combined collaborative workshops and independent analysis. Cross-functional sessions involving key product and technology stakeholders enabled open discussion on the alignment between portfolio and product-level activities. Offline reviews of RAPID matrices and templates allowed teams to evaluate the completeness, usability, and operational feasibility of the proposed process artefacts. In-life testing of selected templates and process steps provided practical insight into how the PLCM model performs under real execution conditions.

The PoC surfaced challenges in areas such as role clarity, template usability, KPI coverage, and tooling. These insights led to targeted adjustments of the PLCM framework, creating a validated foundation for scaling through subsequent implementation waves (Table 10, Table 11). To enable a rapid start of Wave 1, critical blockers were prioritized and resolved, while remaining refinements were deferred to the ongoing improvement backlog for parallel resolution during early execution phases.

Phase	Process Step	Challenges
Strategy	Product scope and concept	<ul style="list-style-type: none"> Activity detail varies by product Competitive analysis depends on scale and is often undocumented Portfolios mix OKRs and KPIs inconsistently PLCM must address launches, updates, retirements, and market expansions Leadership and finance favor detailed business cases over five-year plans
	Technology and platform strategy	
	Competitive landscape	
	Target customer and segmentation	
	Partner strategy	
	Trust by Design	
	Pricing strategy and product financials	
	Product concept approval	
Planning	Product definition	<ul style="list-style-type: none"> Misalignment persists among GPM, LPM, STPL, and TPL Limited capacity to detail demand and budget data for decisions Missing input from stakeholders outside the core PLCM group
	Competitive landscape	
	Target customer and segmentation	
	Architecture and technical solution	
	Operative Model & planning	
	CX Design Plan	
	Trust by design plan	
	Provider selection	
	Product business case	
	Epic creation and prioritization	
	Product approval	
Product Development	Development (including global and local level)	<ul style="list-style-type: none"> Align resources and funding across group and local levels Provide timely inputs to other teams' PI planning for interdependency management
	Local service partner setup	
OpCo Readiness	Commercial tools and OpCo mapping	<ul style="list-style-type: none"> Simplify PLCM to ease scaling into new markets Balance demand flow from group to local entities Harmonize practices between group and local teams
	Tech/business info handover to OpCo	
	Local/Group processes interlock	
	Local service partner set-up	
	Trust by Design	
	Product name approval	
Launch	Go-to market	<ul style="list-style-type: none"> GTM varies by product; local teams lead most launches while regulated offerings remain centrally managed
	Service handover and launch	
In-Life	Product in-life management	<ul style="list-style-type: none"> Primary focus on product launches rather than on product evolutions Product manager capacity constraints result in de-prioritization of activities
	Vendor management	
End of life	In-life risk and issue management	<ul style="list-style-type: none"> Alignment gaps across CVM, marketing, IT, networks, ops End-of-life activities under-prioritized
	Product rationalization	
	End of Life plan	
	End of Life execution	

Table 10 - Challenges detected during the PoC

Phase	Process Step	Suggested Modification
Strategy	Product scope and concept	<ul style="list-style-type: none"> Not all activities are needed for every product; detail varies by scale and timeline The order of performing the activities needs to be clearly addressed
	Technology and platform strategy	
	Competitive landscape	
	Target customer and segmentation	
	Partner strategy	
	Trust by Design	
	Pricing strategy and product financials	
	Product concept approval	
Planning	Product definition	<ul style="list-style-type: none"> Market-level opportunity assessment is BAU for CVM; remove from PLCM.
	Competitive landscape	
	Target customer and segmentation	
	Architecture and technical solution	
	Operative Model & planning	
	CX Design Plan	
	Trust by design plan	
	Provider selection	
	Product business case	
	Epic creation and prioritization	
	Product approval	
Product Development	Development (including global and local level)	<ul style="list-style-type: none"> Rename 'Agile Development'. Align with VBPS process. Move PI planning to Planning. Define capacity allocation at group/local levels.
	Local service partner setup	
OpCo Readiness	Commercial tools and OpCo mapping	<ul style="list-style-type: none"> Rename to 'Go to OpCo'. Add contractual templates, suppliers, T&Cs. Cover reconciliation, settlements, and payments.
	Tech/business info handover to OpCo	
	Local/Group processes interlock	
	Local service partner set-up	
	Trust by Design	
	Product name approval	
Launch	Go-to market	<ul style="list-style-type: none"> Include local incentives and commissions. Add 'Ready for Operations' and 'Ready for Service' gates.
	Service handover and launch	
In-Life	Product in-life management	<ul style="list-style-type: none"> -
	Vendor management	
End of Life	In-life risk and issue management	<ul style="list-style-type: none"> Assess performance-improvement options first Cover removal from all platforms and support systems Add billing and service decommissioning steps Tailor End-of-Life actions to product scale
	Product rationalization	
	End of Life plan	
	End of Life execution	

Table 11 - Refinements implemented at the end of the PoC

4.3.2.1 Key learning from the PoC phase

The Proof of Concept (PoC) surfaced several critical insights that informed the refinement of the PLCM framework and associated processes:

- **Variability in process applicability:** The applicability and level of detailing for each PLCM phase vary significantly across different portfolios and products. A flexible approach is necessary to ensure relevance and usability at both strategic and operational levels.
- **Early OpCo involvement:** OpCo participation must be explicitly integrated from the outset. Clear communication of involvement expectations is essential to drive alignment and ownership early in the lifecycle.
- **Integration with Lean Portfolio Management (LPM):** Key Lean Portfolio Management activities, including reviews, fund allocation processes, guardrails, and value stream governance, must be intertwined with PLCM to ensure coherent portfolio execution and value delivery.
- **Accommodation of Waterfall practices:** Some group-level and OpCo teams continue to operate using waterfall methodologies. The PLCM process design must account for this hybrid reality, providing sufficient flexibility to support both Agile and non-Agile delivery models.

4.3.3 Agile transformation results

The evaluation of the Scaled Agile transformation was conducted through an integrated quantitative and qualitative approach. Critical performance indicators (KPIs) were systematically measured and analyzed, complemented by structured interviews with senior stakeholders directly involved in the transformation program.

The KPIs selected captured key dimensions of delivery performance, product quality, team collaboration, and customer satisfaction. Measurements were taken at three pivotal points: the baseline phase (prior to the definition and launch of the Agile transformation), the end of Wave 2, and the end of Wave 3. This longitudinal analysis enabled a clear understanding of improvements, gaps, and trends over time.

In parallel, a series of semi-structured interviews were conducted with senior stakeholders, including department directors, product managers (PMs), and SAFe release train engineers (RTEs). The interviews were designed and analyzed according to the GIOIA methodology [74], ensuring a rigorous, grounded approach to data collection and interpretation. Through systematic coding of first-order concepts, abstraction into second-order themes, and aggregation into higher-level dimensions, the interviews provided structured insights into the strategic, operational, and delivery dynamics underlying the transformation program.

This dual approach allowed a comprehensive evaluation of both the measurable outcomes and the organizational mechanisms shaping the successes and limitations of the Agile transformation journey.

4.3.3.1 Quantitative analysis – KPIs comparison across transformation waves

To support the quantitative component of the analysis, a set of key performance indicators (KPIs) was selected to monitor the impact of the Agile transformation across both B2B and B2C domains. The selected indicators reflect critical dimensions of delivery performance, product quality, customer satisfaction, team collaboration, and process efficiency. Measurements were collected at three stages: prior to the launch of the transformation (baseline), at the conclusion of Wave 2, and at the conclusion of Wave 3. This time-based structure enabled a longitudinal assessment of trends and progress over the course of the transformation.

The key performance indicators (KPIs) used to assess the evolution of delivery performance, product quality, and team dynamics throughout the Agile transformation are summarized in the table below (Table 12).

KPIs measured	Baseline B2B	Baseline B2C	Wave 2 B2B	Wave 2 B2C	Wave 3 B2B	Wave 3 B2C
Average Time-to-Market (days)	125	135	102	110	92	97
Number of Unclear Backlog Items (%)	17%	19%	11%	13%	4%	8%
Features Approved After Iterations (%)	76%	72%	84%	79%	92%	89%
Defects per Release	15	17	11	15	5	7
Customer Satisfaction Score (CSAT)	3,3	3,6	3,9	4,1	4,2	4,1
Sprint Velocity (Story Points/Sprint)	38	32	48	44	56	52
Feature Cycle Time (days)	34	39	26	28	22	24
Team Collaboration Index (1-5)	3,2	2,9	4	3,7	4,4	4,1
Release Frequency (Releases/Year)	4	3	6	5	7	6
Product Quality Index (PQI, 0-100)	73	68	87	76	94	89

Table 12 - KPIs measured before, during and after the Agile transformation

The analysis comparing baseline values with results at the end of Wave 3 confirms a broad and consistent improvement across all key performance indicators. This suggests that the Agile transformation contributed to enhanced delivery efficiency, higher quality, and better team collaboration (Figure 59)

The average time-to-market decreased by 26%, while the feature cycle time was reduced by 36%, indicating that the organization was able to shorten lead times and accelerate value delivery. Sprint velocity increased significantly, reflecting improved team productivity and greater reliability in sprint planning and execution.

One of the most substantial improvements was observed in backlog clarity, with a reduction in unclear items of over 65%. This signals more effective backlog refinement practices, increased stakeholder engagement, and better alignment between business priorities and team execution. In parallel, the percentage of features approved after the first iteration rose, suggesting a better match between product outcomes and expected functionality.

Quality indicators also evolved positively. The number of defects per release declined by over 60%, and the product quality index (PQI) increased by approximately 30%. These shifts point to maturing engineering practices, earlier defect identification, and improved product stability. Customer satisfaction showed a positive, although more moderate, increase. This indicates that while technical and process improvements were realized, further work may be needed to fully translate internal delivery gains into perceived customer value.

Team collaboration, as measured by a dedicated index, improved by close to 40%. This confirms that Agile practices contributed to building more cohesive, cross-functional, and self-organized teams. Finally, release frequency increased significantly, with most teams moving from low-frequency delivery models to continuous or near-continuous release cycles.

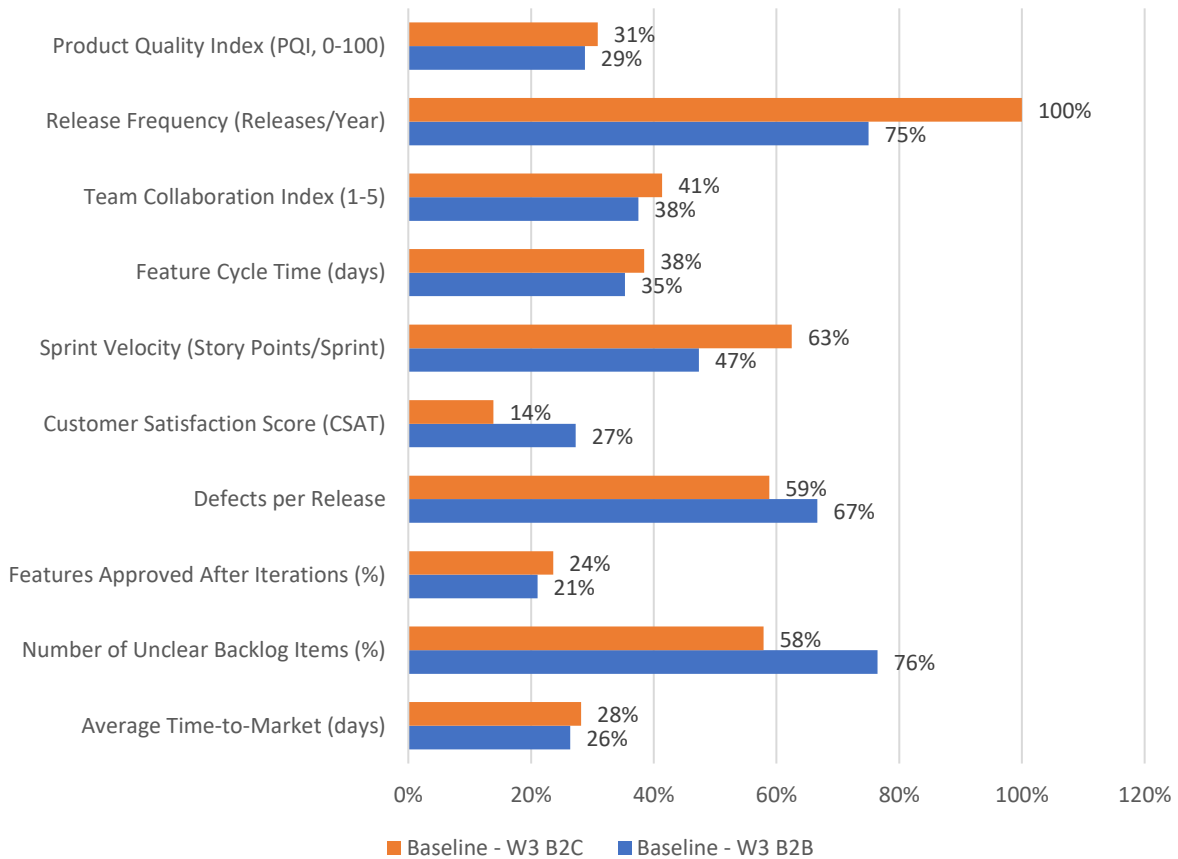


Figure 59 - Optimizations achieved by the Scaled Agile transformation

Comparison between B2B and B2C results

Although both B2B and B2C units benefitted from the transformation, the magnitude and distribution of improvements varied, reflecting the different structural and market conditions in which the teams operated.

B2B teams showed more balanced improvements across all dimensions. Time-to-market was reduced by 26%, backlog clarity improved by 76%, and defects per release decreased by 67%. Customer satisfaction increased by 27%, while team collaboration rose by 38%. These results indicate that B2B units were able to translate Agile practices into consistent performance gains, supported by stable team configurations, clearer stakeholder roles, and a more predictable operating environment. The 75% increase in release frequency further reflects the ability of B2B teams to adopt a regular and incremental delivery model.

B2C teams, while operating in more dynamic and externally driven contexts, also achieved strong results in several areas. Sprint velocity improved by 63%, and release frequency increased by 100%, showing that B2C teams succeeded in accelerating their delivery cycles in response to market pressure. However, improvements in backlog clarity (58%) and customer satisfaction (14%) were more modest, suggesting challenges in maintaining focus and alignment under higher volatility. The reduction in defects per release (59%) and the increase in PQI (31%) confirm that engineering quality improved, although perhaps not at the same pace as delivery speed.

B2B teams demonstrated more uniform and structurally supported improvements, while B2C teams excelled in speed and output but continued to face constraints in stakeholder alignment and strategic coherence. These differences underline the importance of contextualizing Agile practices to the specific operational environment of each business unit.

KPIs trends across the two main transformation phases

To deepen the understanding of how the Agile transformation unfolded over time, KPI variations were analyzed across two distinct phases. The first phase compares performance from the baseline (before the introduction of Agile practices) to the end of Wave 2, while the second phase focuses on the changes observed between the end of Wave 2 and the conclusion of Wave 3. This two-step analysis enables the identification of early versus late-stage effects of the transformation and highlights whether improvements were linear, sustained, or decelerated over time.

The initial phase of the transformation produced the most substantial performance shifts. B2C teams recorded remarkable progress in release frequency (67%), sprint velocity (38%), and feature cycle time (28%). B2B teams showed comparably strong gains in backlog clarity (35%), reduction of unclear items, and a 27% decrease in defects per release. Both domains experienced noticeable improvement in team collaboration and customer satisfaction, though slightly higher in B2B. These results indicate that the introduction of structured Agile practices and early adoption of SAFe ceremonies led to a rapid acceleration in delivery efficiency and process visibility (Figure 60).

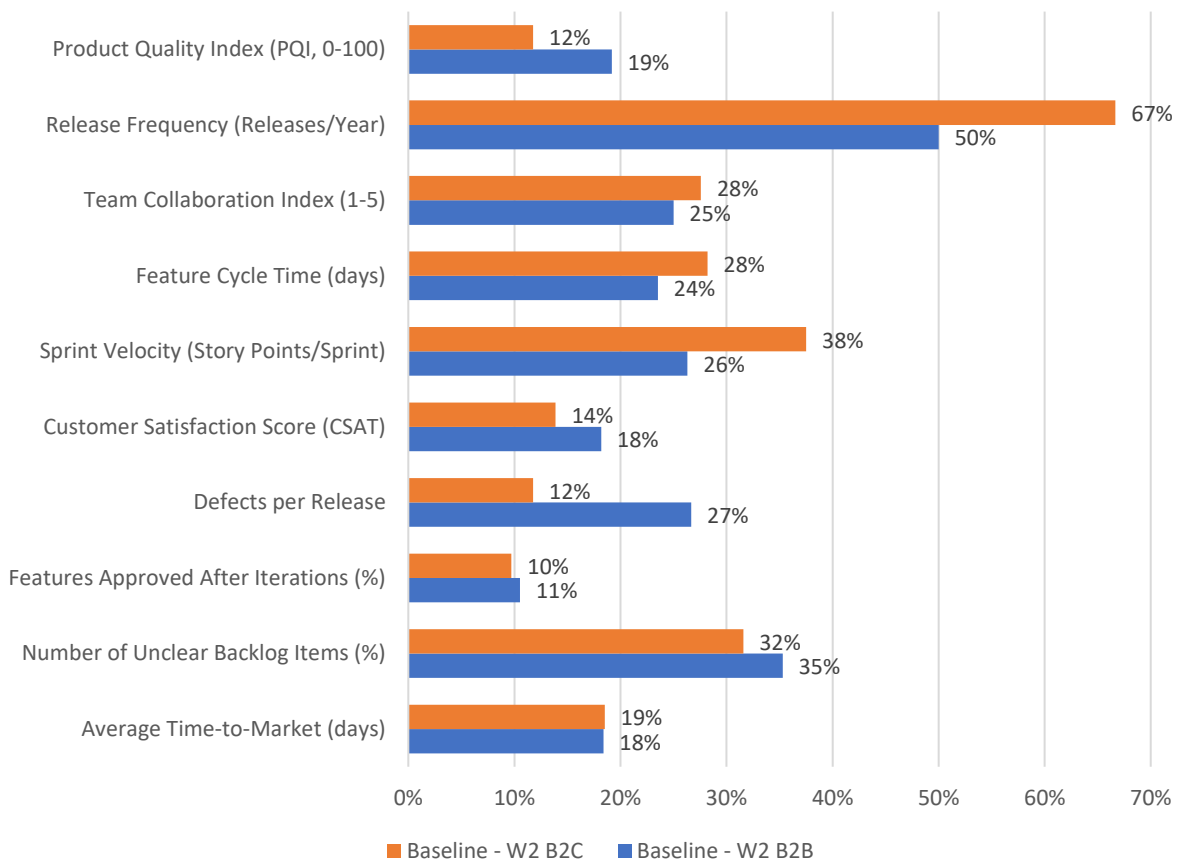


Figure 60 - Optimizations achieved between baseline and the end of Wave 2

In the second phase, performance gains were more moderate. B2B maintained steady improvement, especially in backlog clarity (64%) and defect reduction (55%), while also sustaining growth in team collaboration and velocity. B2C continued progressing in speed-related KPIs such as velocity and cycle time but saw limited improvement in customer satisfaction and backlog clarity. Notably, B2C recorded no further gain in customer satisfaction during this phase, while B2B still improved modestly. Both domains continued to reduce defects per release, suggesting increased maturity in engineering and testing practices.

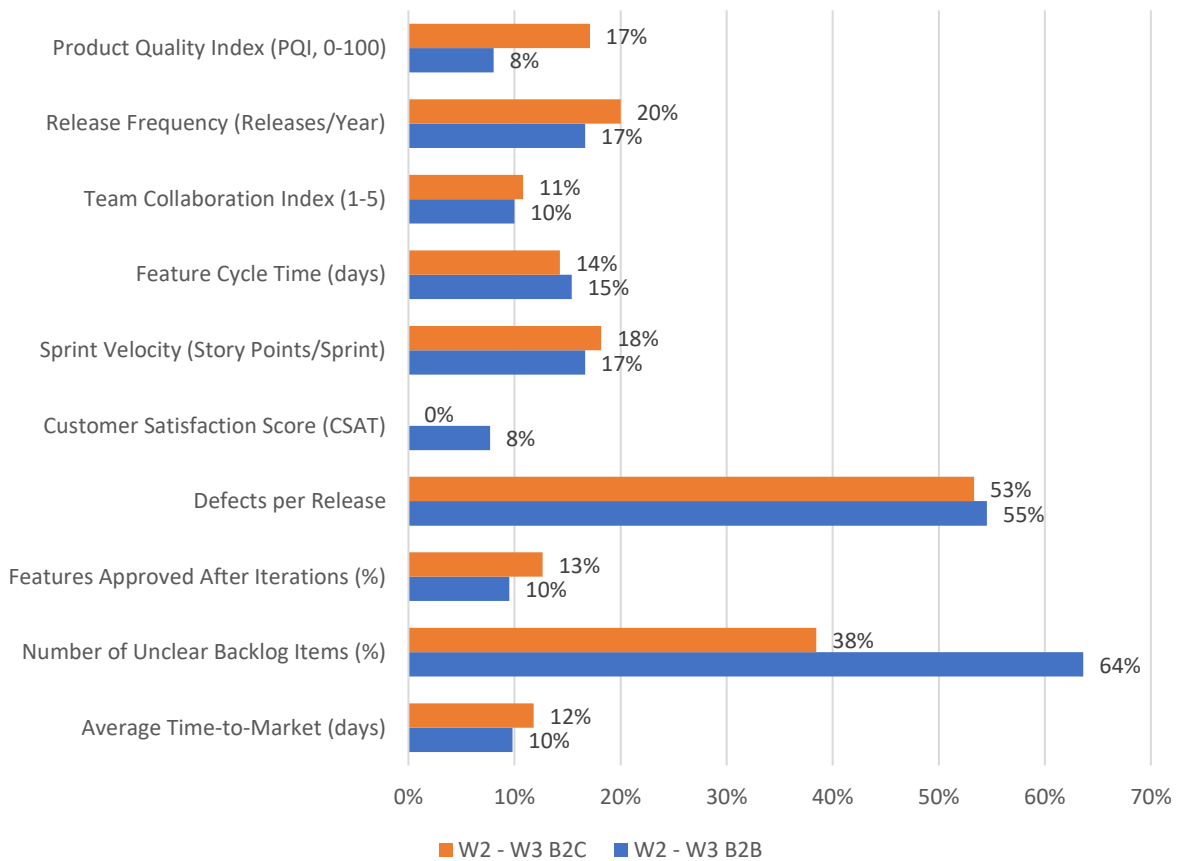


Figure 61 - Optimizations achieved between the end of Wave 2 and the end of Wave 3

The early gains observed from baseline to Wave 2 can be attributed to the initial impact of introducing Agile roles, rituals, and governance structures. These mechanisms tend to generate immediate improvements in delivery cadence, visibility, and team dynamics. However, in the second phase, the transformation reached a more advanced stage in which marginal improvements required deeper behavioral and cultural change. The slower gains from Wave 2 to Wave 3, particularly in B2C, suggest that sustaining improvement under volatile conditions is more challenging. B2B units benefitted from higher structural stability, which enabled them to embed Agile practices more consistently and extract long-term value from them.

Overall, the comparison across phases confirms that the initial transformation phase delivered quick wins, while the later phase required consolidation, adaptation, and discipline to achieve incremental progress. The difference in momentum between B2B and B2C reflects underlying organizational dynamics: stable contexts allowed for sustained improvements, whereas reactive environments required ongoing adjustments that reduced transformation velocity. These findings underscore the importance of tailoring Agile execution to the structural and market conditions of each business domain.

4.3.3.2 Qualitative analysis – Key insights from key stakeholders interviews

To support the qualitative component of the analysis, a set of ten open-ended questions was developed and used during semi-structured interviews with key stakeholders. These questions were designed to explore the perceived impact of the Agile transformation across strategic, operational, and delivery dimensions. Particular attention was given to capturing differences between B2B and B2C contexts, as well as identifying patterns related to team dynamics, process maturity, and organizational alignment.

The full list of questions is reported below:

1. How would you assess the overall effectiveness of the Agile transformation in improving responsiveness and adaptability within your area of responsibility?
2. What differences in Agile adoption and maturity have you observed between B2B and B2C teams?
3. How has the transformation impacted time-to-market performance, and what factors contribute to current improvements or delays?
4. How would you describe the evolution of backlog clarity and feature prioritization across different units?
5. In what ways have quality metrics, such as defects per release and product quality index (PQI), been influenced by Agile practices?
6. How has team collaboration evolved, and what challenges persist in maintaining stable, high-performing Agile teams?
7. What patterns have you noticed regarding sprint velocity trends, and how do these differ between B2B and B2C contexts?
8. How effective have SAFe ceremonies been in ensuring consistent delivery and early risk detection?
9. How would you evaluate the balance between short-term sprint objectives and long-term strategic alignment after the Agile transformation?
10. Based on your experience, what are the critical lessons learned that should guide future improvements in scaling Agile practices across heterogeneous environments?

The results of the qualitative analysis revealed four key aggregate dimensions that synthesize the main drivers and barriers encountered during the transformation. These dimensions reflect how structural factors, market dynamics, implementation practices, and organizational context influenced the effectiveness of Scaled Agile adoption across the enterprise (Table 13).

The structured coding of interview data using the GIOIA methodology confirmed that the outcomes of the Agile transformation were strongly influenced by team stability, stakeholder consistency, and the ability to adapt practices to context. The most effective results were observed in environments with high structural continuity and operational maturity. Conversely, units exposed to frequent market shifts or inconsistent implementation practices struggled to translate Agile principles into sustained delivery performance. The analysis highlighted the importance of disciplined execution, context-specific adaptation, and the alignment between operational routines and strategic intent.

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Aggregate Dimensions	Second-Order Themes	First-Order Concepts
Foundations of Agile effectiveness	Team stability drives consistent performance	Stable teams improved responsiveness, collaboration, and time-to-market (Dir, PM, RTE)
		Team cohesion and delivery predictability were higher in B2B units with less turnover (PM, RTE)
	Stakeholder continuity reinforces predictability	Structured stakeholder engagement enabled faster and clearer decisions (Dir, RTE)
	Mature adoption leads to operational discipline	B2B teams showed consistent sprint velocity and backlog discipline (PM, RTE)
Higher maturity enabled faster prioritization and fewer defects (PM, Dir)		
Fragility in volatile contexts	External volatility disrupts Agile cadence	B2C teams frequently adjusted priorities due to fast-changing market demands (Dir, PM, RTE)
	Backlog instability weakens delivery rhythm	Last-minute requirement changes in B2C destabilized backlog and focus (PM, RTE)
	Inconsistent quality outcomes under pressure	Defect rates and PQI were more volatile in B2C environments (Dir, PM)
Execution gaps in framework adoption	Ceremonial rigor varies across units	Participation in SAFe ceremonies was inconsistent across trains and roles (Dir, PM, RTE)
	Sprint output misaligned with strategic intent	Sprint achievements often failed to translate into long-term business value (Dir, RTE)
Need for contextual scaling	Uniform models underperform in heterogeneous domains	A single scaling model did not fit the structural differences between B2B and B2C (Dir, RTE)
	Tailored practices improve transformation outcomes	Customized prioritization practices improved outcomes in B2B units (PM, RTE)
	Flexibility in implementation enables sustainable agility	Agile practices worked better when adapted to team configuration and market context (PM, Dir)

Table 13 - Result of the applied Gioia methodology

4.4 Case study results summarization

The case study demonstrates that the effectiveness of Scaled Agile transformation depends not only on the adoption of frameworks and ceremonies but also on the organizational conditions in which these practices are implemented. The convergence of performance improvements and stakeholder perspectives reveals a nuanced picture in which structural stability, contextual adaptation, and disciplined execution emerge as critical enablers of success.

In units with relatively stable teams and stakeholders, Agile practices were institutionalized more effectively. These environments exhibited faster delivery cycles, improved feature throughput, clearer backlogs, and stronger team collaboration. Qualitative feedback confirmed that these gains were the result of cumulative learning, consistent roles, and shared ownership. Agile did not merely increase responsiveness but also fostered alignment across business and technology functions when organizational foundations were strong.

By contrast, units operating in more volatile contexts encountered constraints that limited the benefits of Agile adoption. Frequent reprioritization, external dependency, and unstable team composition weakened

planning accuracy and diluted the value of standard Agile routines. Interviewees highlighted how volatility undermined collaboration, reduced the reliability of sprint commitments, and increased rework. While performance still improved in absolute terms, the inconsistency of input and decision-making prevented these improvements from becoming repeatable patterns.

Frameworks such as SAFe provided a helpful baseline, but their impact was shaped by how rigorously and consistently they were executed. Where participation was disciplined and ceremonies were used to address cross-cutting risks, alignment and predictability improved. However, in several instances, the mechanical adoption of roles and rituals without meaningful engagement led to limited strategic integration and superficial coordination.

A key insight that emerged across both qualitative and quantitative evidence is the necessity of contextual adaptation. Organizational units with different market dynamics, structural maturity, and operational constraints responded differently to the same transformation approach. The most effective outcomes occurred where Agile practices were consciously adapted to fit the business context rather than uniformly imposed. Tailoring became a condition for agility itself, not a deviation from best practice.

In conclusion, Scaled Agile transformation is not a technical rollout but an organizational redesign. Its success depends on a deliberate balance between structural enablers, adaptive execution, and stakeholder engagement. Sustainable improvement is achieved when Agile is not only implemented but embedded into the rhythm, constraints, and strategic priorities of each specific environment.

5 ACTIVE CHANGE: Organizational enabler for Agile adoption

Based on the findings from the literature review, the enterprise survey, and the case study, it became clear that Agile frameworks clarified what to do and how to operate in an Agile way but did not provide guidance on how to effectively adopt Agile from an organizational change perspective. The most significant challenges encountered in large-scale transformations were not technical. Instead, they stemmed from human and organizational factors such as lack of leadership support, insufficient Agile knowledge due to limited training, weak team engagement, unclear ownership, and persistent difficulties in coordinating multi-team environments and managing transitions. These issues emerged consistently across all sources and were particularly acute in large organizations, where structural complexity amplified resistance and delayed adoption.

In contrast, organizations with simpler structures and more direct leadership involvement experienced faster alignment and greater responsiveness. Their relative success was not due to the selection of a different framework, but rather to a stronger capacity to manage change effectively. The case study confirmed that Agile practices delivered sustainable results only when consciously adapted to the specific context. Agile did not function as a one-size-fits-all solution, but as a transformation process that required stable team structures, clearly defined roles, cultural alignment, and sustained engagement. Where these conditions were absent, Agile frameworks were often adopted in a mechanical manner and failed to generate meaningful or lasting impact.

This body of evidence highlights a critical gap. The problem was not how to implement Agile routines, but how to enable organizations to adopt Agile as a comprehensive and sustainable transformation. What was missing was a structured approach capable of guiding organizations through the necessary cultural, structural, and leadership adaptations.

The ACTIVE CHANGE framework is introduced as a direct response to this need. It is designed to support the adoption of Agile practices through the lens of organizational change management, complementing delivery-focused methodologies by addressing the behavioral, structural, and systemic dimensions that determine the effectiveness of Agile transformations.

The framework consists of two integrated components. The first includes six guiding principles, organized under the acronym ACTIVE. These principles provide a strategic foundation for introducing Agile in a way that is purpose-driven, collaboratively designed, iteratively tested, and supported by enabling structures. They emphasize the importance of transparency in tracking progress and the necessity of evolving the broader system beyond team-level practices.

The second component, known as CHANGE, defines the execution model for the transformation. It outlines six iterative and progressive phases, from commitment and preparation to activation, normalization, scaling, and institutionalization. Each phase is designed to support incremental change while reinforcing internal ownership, feedback loops, and continuous learning.

The framework does not impose a predefined model of agility. Instead, it enables each organization to shape its own path through structured experimentation and co-design. Its aim is to reduce resistance, clarify roles and expectations, and create the conditions necessary for Agile to become embedded into the organization's operating model.

5.1 ACTIVE guiding principles: Framing Agile as organizational change

The ACTIVE CHANGE framework is grounded in six guiding principles that define how Agile should be introduced and sustained as a form of organizational change. These principles, organized under the acronym

ACTIVE, are not abstract declarations but concrete design choices that shape how Agile transformations are initiated, communicated, adapted, and embedded across the enterprise.

Traditional Agile frameworks focus primarily on team-level delivery processes. While essential, these elements alone are not sufficient to generate lasting transformation at scale. The ACTIVE principles address this gap by shifting the focus from delivery routines to the broader system of strategic alignment, stakeholder engagement, structured experimentation, cultural enablement, and organizational evolution. Each principle addresses a common failure pattern observed in large-scale transformations and contributes to a connected and adaptive approach to Agile adoption.

A – Align with purpose

Agile transformation must begin with clarity of intent. It cannot be introduced as a generic method or trend but must be positioned as a deliberate response to specific business needs. Aligning with purpose requires organizations to define why they are adopting Agile, what outcomes they seek, and what constraints they aim to overcome. This clarity sets the foundation for shared direction and mitigates the risk of superficial compliance or fragmented execution.

Strategic alignment is not only the starting point but the reference throughout the journey. Without it, later efforts such as co-design or testing may become disconnected or misdirected. When alignment is strong, stakeholder participation becomes meaningful, experiments are grounded in actual goals, and system-level evolution is both legitimate and coherent.

C – Co-design the change

Effective Agile transformation cannot rely solely on top-down mandates. Co-designing the change means actively involving those who will be affected, such as delivery teams, middle managers, and enabling functions, in defining how Agile should be introduced. This participatory approach builds credibility, surfaces operational constraints early, and fosters shared ownership of both challenges and solutions.

Co-design increases the feasibility of early-stage experimentation by aligning proposed changes with organizational realities. It enables the emergence of context-sensitive solutions, reduces resistance, and creates conditions for internal learning loops. Moreover, when stakeholders are co-creators rather than passive recipients, change becomes a collective endeavor rather than a compliance exercise.

T – Test and learn

Agile transformations themselves must embody the principles of agility. Rather than relying on a fixed deployment plan, the introduction of Agile should be conducted iteratively. This involves launching pilots, validating assumptions, collecting structured feedback, and refining the model progressively. A test-and-learn approach allows the organization to discover what works in context, without the risks of premature scaling or over-standardization.

This principle operationalizes adaptation. It bridges the gap between strategic intent and practical execution, translating insights from co-design into concrete experiments. It also produces evidence that informs visibility and drives system evolution. When executed well, this approach builds organizational confidence in the transformation process and enables faster adjustments in response to complexity.

I – Invest in enablers

Sustainable change cannot be driven by intention alone. Agile adoption requires infrastructure, expertise, and dedicated roles to succeed. Investing in enablers means providing targeted training, coaching support, internal communities of practice, and leadership development aligned with Agile principles.

Enablers are what convert design into action. Even when purpose is clear and change is co-designed, the absence of support systems leads to stagnation. Enablers reinforce behavioral change, prevent the decay of early progress, and provide a stabilizing function during the uncertainties of transformation. They also ensure that learning from experimentation does not remain isolated but contributes to building internal capability over time.

V – Visualize progress

Making progress visible is essential for maintaining momentum and trust. This principle involves tracking both quantitative indicators such as throughput, quality, or employee engagement, and qualitative signals such as alignment, sentiment, and observed behaviors. Visibility supports informed decision-making, reinforces accountability, and enables leadership to calibrate the transformation without overreacting to isolated feedback.

Progress visualization also contributes to psychological safety. When performance and challenges are made transparent, teams are more likely to engage in honest reflection and continuous improvement. Furthermore, visibility acts as a connector: it validates alignment, provides feedback to inform co-design, guides enabler allocation, and identifies where systemic change may be needed.

E – Evolve the system

Agile transformation is incomplete if it remains confined to delivery teams. True agility requires changes in governance, funding models, performance management, and leadership behaviors. Evolving the system means removing organizational barriers that contradict Agile principles and redesigning key mechanisms to support responsiveness, flow, and learning.

Systemic evolution consolidates all prior principles. It gives structural continuity to lessons learned during experimentation and converts local gains into enterprise-wide capabilities. Without this phase, even well-executed pilots remain isolated and fragile. Evolving the system ensures that Agile becomes embedded, scalable, and sustainable as part of the organization's operating model and culture.

When these principles are applied together, they do not function as sequential steps but as an integrated, reinforcing system. Alignment creates a shared strategic narrative. Co-design translates that narrative into locally feasible plans. Experimentation tests these plans in practice. Enablers provide the necessary support to make them work. Visibility ensures that progress is understood and shared. Systemic evolution embeds these learnings and prepares the organization for further adaptation.

In this way, the ACTIVE principles enable a transformation process that is not only structured and resilient, but also adaptive, participatory, and aligned with the unique context of the organization. The result is a shift from performing Agile practices to becoming an Agile organization.

5.2 ACE personas: Organizational roles enabling Agile adoption

The ACTIVE CHANGE framework introduces three dedicated personas designed to ensure the organizational change required for a successful Scaled Agile transformation. These roles do not focus on delivery execution but instead enable the structural, cultural, and leadership conditions needed for Agile to take root and grow sustainably across complex enterprises.

Known as the **ACE personas**, they form a complementary layer to existing Agile roles and operate at the organizational level to guide, support, and embed Agile as a transformative force.

A – Adoption Leader

The Adoption Leader ensures that the Agile transformation is anchored in clear strategic intent. This persona does not coordinate delivery or project execution but instead works at the intersection of strategy and transformation governance. The Adoption Leader connects executive leadership with the operational layers, ensuring coherence between the purpose of Agile adoption and the actual change agenda. They act as sponsors of the transformation, shaping the roadmap, aligning stakeholders, and validating that initiatives are tied to measurable business outcomes. In essence, they guarantee that the transformation is not an isolated IT effort, but an enterprise-wide evolution.

C – Culture Catalyst

The Culture Catalyst operates across formal and informal networks to accelerate the development of Agile mindset and behaviors. This persona is focused on enabling learning, engagement, and cultural alignment. They activate communities of practice, design rituals that embed Agile values, and support people managers in evolving their leadership style. The Culture Catalyst monitors behavioral shifts and helps teams internalize Agile principles beyond tools and ceremonies. They serve as bridge-builders across silos and departments, promoting a shared vocabulary and reinforcing psychological safety.

E – Ecosystem Connector

The Ecosystem Connector plays a critical role in aligning support functions with the Agile operating model. Unlike traditional transformation managers who focus on rollout plans, this persona ensures that structural enablers such as performance management, procurement, HR, finance, and compliance evolve in parallel with delivery practices. The Ecosystem Connector identifies organizational misalignments, facilitates cross-functional collaboration, and supports systemic redesign. This role is key to removing institutional friction and embedding agility beyond the team level.

5.2.1 Continuous collaboration across ACE personas

The three personas are in constant connection to identify obstacles and support a successful Scaled Agile transformation. Their collaboration ensures alignment between strategic vision, cultural evolution, and structural enablers, embedding agility across the entire organization (Figure 62).

- **Adoption Leader to Culture Catalyst:** The Adoption Leader guides the Culture Catalyst to ensure that cultural development aligns with the strategic goals of the transformation
- **Culture Catalyst to Ecosystem Connector:** The Culture Catalyst channels team feedback to the Ecosystem Connector, enabling systemic adaptations based on real organizational needs
- **Ecosystem Connector to Adoption Leader:** The Ecosystem Connector informs the Adoption Leader about required structural evolutions needed to support the transformation strategy
- **Adoption Leader and Ecosystem Connector:** The Adoption Leader and Ecosystem Connector collaborate to align top-down strategic vision with bottom-up operational enablers
- **Culture Catalyst and Adoption Leader:** The Culture Catalyst helps the Adoption Leader translate strategic intent into behaviors, rituals, and leadership practices
- **Ecosystem Connector and Culture Catalyst:** The Ecosystem Connector and Culture Catalyst work together to ensure that enabling functions reflect the cultural and operational needs of Agile teams

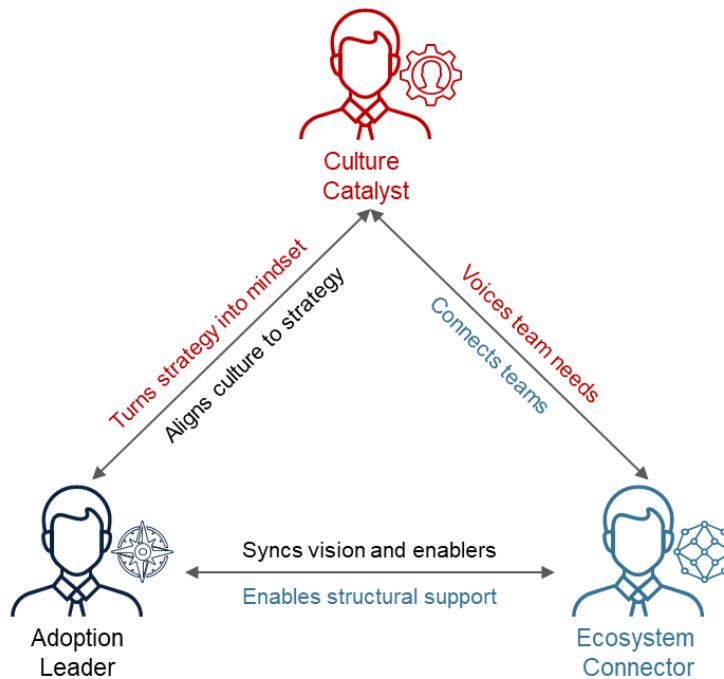


Figure 62 - Continuous collaboration across ACE personas

5.2.2 Interaction with Scrum Roles

The ACE personas do not replace nor interfere with the core Scrum roles of Product Owner, Scrum Master, or Development Team. Rather, they address gaps that lie beyond the scope of team-based agility.

- The **Adoption Leader** supports Product Owners and Scrum Masters by ensuring that the organization provides clarity, alignment, and sustained sponsorship. For example, while Product Owners prioritize backlogs, the Adoption Leader ensures that those priorities reflect enterprise objectives and are not undermined by shifting governance structures.
- The **Culture Catalyst** complements the Scrum Master. While the Scrum Master fosters team-level collaboration and process integrity, the Culture Catalyst works at the organizational level to sustain Agile values, remove cultural blockers, and promote cohesion across teams and departments.
- The **Ecosystem Connector** indirectly supports the entire Scrum team by removing structural bottlenecks that slow down delivery or cause misalignment. They work with finance to enable adaptive funding, with HR to support role clarity, and with procurement to adapt contracting models that match Agil

5.2.3 Interaction with SAFe Roles

In the context of the Scaled Agile Framework (SAFe), the ACE personas operate at a different layer, complementing but not duplicating existing roles such as Release Train Engineer (RTE), Solution Train Engineer (STE), or Business Owners.

- The **Adoption Leader** aligns closely with Business Owners and Portfolio Managers but with a more transversal and strategic mandate. While SAFe emphasizes lean portfolio management and funding alignment, the Adoption Leader ensures that transformation intent and strategy are translated into cohesive change efforts across portfolios.
- The **Culture Catalyst** works in synergy with RTEs and Agile Coaches. Whereas RTEs facilitate program-level execution, the Culture Catalyst nurtures the cultural foundation that allows ARTs (Agile Release

Trains) to flourish. They reinforce leadership maturity, foster communities of practice, and scale shared values across organizational boundaries.

- The **Ecosystem Connector** is particularly relevant in enterprise SAFe implementations. They collaborate with Lean-Agile Center of Excellence (LACE) teams but focus more explicitly on synchronizing enterprise services (like HR, Legal, Finance) with the transformation effort. This helps avoid the common disconnect between delivery agility and enterprise processes.

5.3 ACTIVE CHANGE framework: Iterative phases for executing Scaled Agile transformation

The ACTIVE CHANGE framework integrates a structured execution model referred to as the CHANGE framework. This model outlines six iterative phases that guide the implementation of Scaled Agile transformations in complex enterprises. Each phase balances the need for strategic alignment, operational experimentation, and systemic adaptation. Unlike linear rollout plans, the ACTIVE CHANGE framework encourages progressive learning, reinforcing feedback loops, and coordinated scaling.

Each phase builds on the insights and outcomes of the previous one but retains flexibility to be revisited as new needs emerge. This adaptability ensures that transformation efforts remain responsive to the realities of each organizational context. The six phases are: Commit, Headstart, Activate, Normalize, Grow, and Evolve (Figure 63).

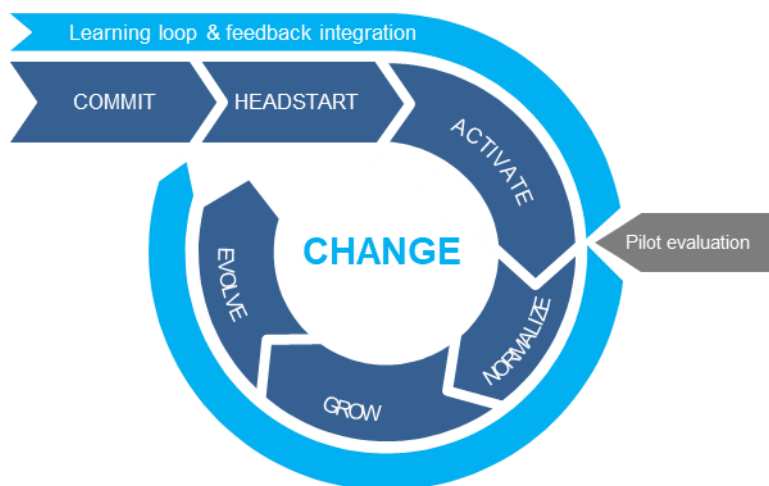


Figure 63 - ACTIVE CHANGE iterative phases

C – Commit

Goal: Establish the strategic mandate and cross-functional alignment required to initiate the transformation.

In this phase, the transformation is framed as a strategic priority and is formally launched through executive sponsorship and clear governance structures. The focus is on defining the intent, scope, and high-level roadmap of the transformation while securing organizational alignment.

Key Activities:

- Define the transformation vision, rationale, and measurable goals
- Map the affected domains (e.g., business units, IT, operations)
- Secure executive sponsorship and create a transformation governance structure
- Set up a transformation leadership team and clarify ownership
- Build the initial transformation backlog (themes, priorities, dependencies)

Outputs:

- Clear business case and transformation scope
- Shared leadership commitment
- Transformation governance and roles in place
- Initial roadmap and prioritized backlog

H – Headstart

Goal: Prepare the environment for Agile adoption through training, structural readiness, and early learning.

This phase focuses on building foundational readiness across people, structures, and shared language. It includes capability building, assessing current maturity, and conducting early comparative experiments such as a Proof of Concept (PoC) to create alignment and demonstrate feasibility.

Key Activities:

- Run maturity and structural readiness assessments
- Define the first version of the Agile operating model (team types, delivery layers, coordination patterns)
- Train leaders, product owners, coaches, and delivery teams
- Standardize language, templates, and Agile playbooks
- Run a PoC comparing traditional and Agile approaches to the same project scope

Outputs:

- Trained core actors and alignment on roles
- Initial Agile structures and shared language in place
- Real-world insights from the PoC to support transition conversations
- Teams and leaders are aware of what Agile means in their own context

A – Activate

Goal: Launch pilot initiatives in real delivery settings to validate the model and generate actionable learning. Here, Agile ways of working are introduced into live delivery settings. The focus is on validating the new operating model, uncovering friction points, and collecting lessons learned that can be used to improve and scale the transformation.

Key Activities:

- Identify pilot teams or release trains based on readiness and strategic value
- Ensure backlog availability and readiness to deliver incrementally
- Embed coaching and support roles to facilitate day-to-day practice
- Run full Agile delivery cycles (sprints, program increments)
- Conduct retrospectives and capture structural blockers

Outputs:

- Agile teams delivering value in real projects

- Observed frictions and improvement areas logged
- Early success stories to support broader engagement
- First feedback loop into the operating model

N – Normalize

Goal: Stabilize the initial system and create a foundation for repeatability and broader adoption.

The Normalize phase strengthens consistency and prepares the organization for expansion. It focuses on codifying practices, enhancing coordination, and enabling the internal capability needed for sustainable growth.

Key Activities:

- Refine practices and operating model based on pilot learning
- Establish shared Agile ceremonies at the team and program levels (e.g., backlog refinement, PI planning, reviews)
- Build cross-team communities of practice (Scrum Masters, Product Owners, Architects)
- Introduce lean portfolio visibility and coordination mechanisms
- Start shifting support functions (PMO, HR, Finance) toward Agile-aware behaviors

Outputs:

- Consistent Agile execution across initial programs
- Internal capability growing through communities and role clarity
- Structural blockers progressively addressed
- Readiness to scale without replication of early friction

G – Grow

Goal: Expand Agile ways of working across additional domains and functions.

In this phase, the transformation scales outward from early adopters. The focus shifts to onboarding new domains, adapting models to local needs, and reinforcing transformation across business and support units.

Key Activities:

- Identify and prioritize next domains for onboarding
- Replicate only what worked: avoid forcing one-size-fits-all models
- Scale Agile leadership and funding models (e.g., value stream-based funding)
- Extend transformation to adjacent functions (e.g., marketing, risk, procurement)
- Formalize training paths and mentoring infrastructure for new entrants

Outputs:

- Broader and more diverse Agile adoption
- Tailored models emerging across domains with strategic alignment
- Enterprise portfolio coordination practices evolving
- Agile seen as part of business, not just IT

E – Evolve

Goal: Institutionalize agility by embedding learning, adaptability, and systemic coherence.

The final phase focuses on ensuring that Agile becomes an integral part of how the organization operates. It targets the deeper systems (i.e., governance, incentives, leadership models) that must change to sustain agility in the long term.

Key Activities:

- Introduce system-level retrospectives and maturity assessments
- Adapt KPIs and incentives to reward flow, learning, and outcomes
- Evolve governance, budgeting, and performance management to support agility
- Refactor legacy processes and policies that block responsiveness
- Refresh leadership models to sustain a culture of continuous improvement

Outputs:

- Agility embedded in structure, culture, and leadership
- Systemic alignment between strategy, funding, and delivery
- Learning loops institutionalized across teams and portfolios
- Transformation becomes continuous, not episodic

5.3.1 Summary flow of the CHANGE framework

The six phases of the CHANGE framework are summarized in the table below (Table 14). Each phase captures a key objective and its corresponding outcome, offering a clear and structured view of how agility evolves from initial alignment to full organizational embedding.

Phase	Objective	Core Outcome
Commit	Define intent and secure alignment	Clear mandate and shared roadmap
Headstart	Prepare and test in controlled form	Agile-ready system with PoC validation
Activate	Validate model in live settings	Agile teams delivering and generating insights
Normalize	Stabilize and standardize practices	Repeatable patterns and capability growth
Grow	Expand adoption across the org	Enterprise-wide agility, context-aware scaling
Evolve	Institutionalize and adapt	Agility embedded in systems and culture

Table 14 - Summary Flow of the ACTIVE CHANGE Framework

5.3.2 Iterative loops and feedback mechanisms in the CHANGE framework

While the CHANGE framework provides a structured, phased model for executing Agile transformations at scale, it is not designed as a rigid sequence. On the contrary, one of its core strengths lies in its capacity to support recursion, adaptation, and iterative feedback. This section defines the key loop-back mechanisms embedded in the framework and explains their function, purpose, and activation triggers (Figure 64).

Agile transformations often surface unanticipated constraints, new insights, or organizational shifts that require previous assumptions to be revisited. For this reason, the CHANGE phases are connected by a set of loop-back arrows that allow organizations to move backward across phases, when necessary, without compromising transformation coherence. These feedback paths are pre-designed to maintain continuity while embracing non-linear progression.

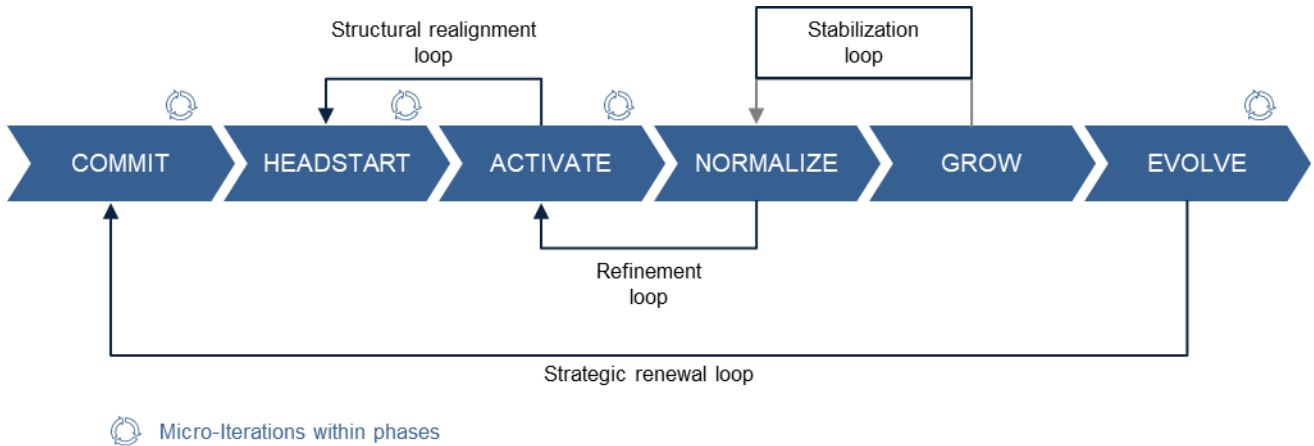


Figure 64 - Iterative loops and feedback mechanisms in the ACTIVE CHANGE framework

Loop A: Structural realignment loop (Activate ← Headstart)

- **Purpose:** To return to the preparation phase and revise the Agile operating model, training scope, or maturity assessment approach.
- **Activation:** Triggered when pilot teams in the Activate phase encounter structural issues such as inadequate team configurations, role confusion, or poor alignment across coordination layers.
- **Outcome:** Strengthens readiness before attempting broader Agile implementation, minimizing risk of premature scale-up.

Loop B: Stabilization loop (Grow ← Normalize)

- **Purpose:** To return to the Normalize phase in order to reinforce foundational practices and increase consistency across newly onboarded domains.
- **Activation:** Triggered when domain-specific adoptions during the Grow phase reveal inconsistencies, local adaptations that conflict with systemic logic, or weak cross-team integration.
- **Outcome:** Ensures that expansion does not amplify inefficiencies or misalignments.

Loop C: Refinement loop (Normalize ← Activate)

- **Purpose:** To test refined practices or updated coordination mechanisms in controlled delivery environments before institutionalizing them.
- **Activation:** Triggered when process improvements or role clarifications need validation prior to scaling across additional programs or functions.
- **Outcome:** Reduces risk of over-standardization and encourages bottom-up experimentation.

Loop D: Strategic renewal loop (Evolve ← Commit)

- **Purpose:** To revisit the transformation mandate, strategic intent, and governance model based on accumulated learning or shifts in enterprise context.

- **Activation:** Triggered when new leadership is introduced, business priorities change, or Agile maturity has reached a point requiring a redefinition of purpose.
- **Outcome:** Prevents stagnation, reaffirms transformation ownership, and aligns long-term agility goals with evolving business strategy.

Micro-Iterations within phases

Beyond formal loopbacks, each CHANGE phase contains its own internal cycles of iteration. For example:

- Commit may include multiple alignment sessions with different stakeholders
- Headstart often involves adjusting training based on early feedback
- Activate includes iterative retrospectives and real-time adaptation
- Evolve depends on recurrent system-level retrospectives and KPI reviews

5.3.3 Integrating control gates and governance forums into the CHANGE framework

To operationalize the recursive nature of Agile transformation, the CHANGE framework embeds two complementary governance mechanisms: transformation councils and control gates. These structures ensure that loop-back mechanisms are not left to chance but are activated deliberately based on evidence and organizational readiness.

5.3.3.1 Transformation councils: Institutionalizing adaptive governance

Transformation councils are cross-functional decision-making bodies responsible for guiding the trajectory of the Agile transformation. They provide a rhythm of reflection and alignment that matches the cadence of Agile delivery, typically every six to eight weeks.

There are six distinct types of transformation councils aligned with the phase structure of the CHANGE framework:

Executive Council

- **Purpose:** Define the transformation mandate, approve funding, and set enterprise OKRs
- **Phase:** Commit
- **Led by:** Adoption Leader
- **ACE roles:**
 - Adoption Leader: Anchors strategic intent
 - Culture Catalyst: Supports leadership engagement and mindset shift
 - Ecosystem Connector: Aligns finance, HR, and structural enablers
- **Scrum participants:** Executive Sponsor, Product Owner, Agile Coach
- **SAFe participants:** Lean Portfolio Management (LPM), Epic Owners, Enterprise Architects

Agile Readiness Forum

- **Purpose:** Assess training, operating model readiness, and alignment on Agile structures
- **Phase:** Headstart
- **Led by:** Culture Catalyst
- **ACE roles:**
 - Adoption Leader: Confirms alignment with strategic goals

- Culture Catalyst: Evaluates behavioral readiness and shared language
- Ecosystem Connector: Checks structural maturity and support function alignment
- **Scrum participants:** Scrum Masters, Agile Coaches, HR Leads
- **SAFe participants:** Release Train Engineers (RTEs), System Architects, HR Business Partners, Finance

Delivery Council

- **Purpose:** Review early delivery performance, retrospective data, and operating frictions
- **Phase:** Activate to Normalize transition
- **Led by:** Ecosystem Connector
- **ACE roles:**
 - Adoption Leader: Integrates feedback into roadmap adjustments
 - Culture Catalyst: Monitors Agile practices and team dynamics
 - Ecosystem Connector: Checks structural maturity and support function alignment
- **Scrum participants:** Product Owners, Scrum Masters
- **SAFe participants:** RTEs, Product Managers, System Team leads

System Maturity Board

- **Purpose:** Ensure consistent Agile practices, capability growth, and operational coherence
- **Phase:** Normalize
- **Led by:** Adoption Leader
- **ACE roles:**
 - Adoption Leader: Validates maturity against transformation strategy
 - Culture Catalyst: Sustains communities of practice and role alignment
 - Ecosystem Connector: Ensures enabling functions support Agile execution
- **Scrum participants:** Department Heads, Agile Coaches, Tribe Leads
- **SAFe participants:** LACE leads, Portfolio PMO, Functional Area Owners

Expansion Council

- **Purpose:** Guide scaling across new domains, monitor cultural integration, adapt operating model
- **Phase:** Grow
- **Led by:** Culture Catalyst
- **ACE roles:**
 - Adoption Leader: Aligns expansion to original roadmap
 - Culture Catalyst: Ensures cultural coherence and maturity scaling
 - Ecosystem Connector: Assesses scalability of funding and enterprise services
- **Scrum participants:** Agile Champions, Product Leaders, Functional Managers
- **SAFe participants:** Value Stream Engineers, Business Stakeholders, RTEs from new domains

Evolution Council

- **Purpose:** Refresh KPIs, funding logic, leadership models, and strategic governance for sustained agility
- **Phase:** Evolve
- **Led by:** Ecosystem Connector
- **ACE roles:**

- Adoption Leader: Revisits strategic intent based on maturity
- Culture Catalyst: Supports leadership evolution and cultural sustainment
- Ecosystem Connector: Leads systemic redesign and feedback integration
- **Scrum participants:** Executive Sponsor, HR Leads, Agile Coaches, Finance, Strategy
- **SAFe participants:** Enterprise Architect, LPM, HR/Finance Strategy, LACE, Business Agility Value Stream Leaders

Each council reviews inputs such as retrospective data, CoP insights, KPIs, and transformation OKRs to make informed decisions. These forums act as sensing-and-response mechanisms to navigate complex organizational dynamics.

5.3.3.2 Control gates: Structured progression with conditional advancement

Each of the six CHANGE phases concludes with a control gate. These formal checkpoints assess whether the necessary conditions for progression have been met. If significant gaps are identified, loop-back mechanisms are activated, and corrective actions are prioritized.

Control gates are not simply pass/fail reviews but decision rituals guided by data and cross-functional input. Their purpose is to validate readiness, ensure alignment, and provide direction for next steps (Table 15, Table 16).

Control gates are placed as follows:

- **End of commit:** Validates the existence of a formal transformation mandate, with clear alignment between strategic intent, funding decisions, and governance setup.
 - **Key checks:** documented business case, allocated funding, executive sponsorship, defined transformation backlog, confirmed governance charter
 - **Decision body:** Executive Council (led by the Adoption Leader)
- **End of headstart:** Assesses foundational readiness across people, roles, and structures. Ensures that Agile playbooks are defined, key actors are trained, and PoC learnings are captured and integrated.
 - **Key checks:** maturity assessment results, defined Agile operating model, training completion, documented PoC outcomes, backlog readiness
 - **Decision body:** Agile Readiness Forum (led by the Culture Catalyst)
- **End of activate:** Evaluates the effectiveness of pilot implementations. Focuses on team performance, delivery velocity, coordination frictions, and retrospective insights.
 - **Key checks:** working Agile teams, observed delivery outcomes, documented frictions, backlog evolution, coaching engagement
 - **Decision body:** Delivery Council (led by the Ecosystem Connector)
- **End of normalize:** Confirms the stabilization of Agile execution and the integration of enabling functions such as PMO, HR, and Finance. Reviews operational KPIs and role maturity.
 - **Key checks:** adherence to Agile ceremonies, capability maturity, community of practice health, initial portfolio coordination, cross-functional enablement
 - **Decision body:** System Maturity Board (led by the Adoption Leader)

- **End of grow:** Validates successful scaling across new domains. Assesses whether localized adaptations align with core transformation principles and whether cultural alignment is maintained.
 - **Key checks:** domain-level operating model adaptations, cultural engagement indicators, leadership maturity, coordination across value streams
 - **Decision body:** Expansion Council (led by the Culture Catalyst)
- **End of evolve:** Confirms that agility has been institutionalized through governance, metrics, and leadership behaviors. This gate ensures the organization can sustain continuous evolution without external intervention.
 - **Key checks:** systemic learning loops, enterprise agility KPIs, adaptive governance mechanisms, refactored incentive structures, embedded cultural practices
 - **Decision body:** Strategic Steering Committee (led by the Ecosystem Connector; formerly labeled Evolution Council)

Control Gate	Activated by Council	Key Inputs	Key Outputs
Commit → Headstart	Executive Council	<ul style="list-style-type: none"> • Vision statement • Funding plan • Transformation OKRs 	<ul style="list-style-type: none"> • Governance charter • Transformation backlog
Headstart → Activate	Agile Readiness Forum	<ul style="list-style-type: none"> • PoC results • Training readiness • Backlog depth 	<ul style="list-style-type: none"> • Team deployment plan • Operating model refinement
Activate → Normalize	Delivery Council	<ul style="list-style-type: none"> • Retrospectives • Increment reviews • Delivery metrics 	<ul style="list-style-type: none"> • Normalization backlog • Process refinement actions
Normalize → Grow	System Maturity Board	<ul style="list-style-type: none"> • KPI trends • CoP feedback • Support function status 	<ul style="list-style-type: none"> • Cross-team cadence model • Scaling readiness
Grow → Evolve	Expansion Council	<ul style="list-style-type: none"> • Cultural assessments • Onboarding reports 	<ul style="list-style-type: none"> • Institutional agility plan • Strategic integration
Evolve → Commit (Loop)	Evolution Council	<ul style="list-style-type: none"> • Leadership review • Continuous improvement outcomes 	<ul style="list-style-type: none"> • Renewed mandate • Transformation portfolio refresh

Table 15 - Control gates inputs-outputs

Control Gate	Activated by Council	Participants (SAFe)	Participants (Scrum)
Commit → Headstart	Executive Council	<ul style="list-style-type: none"> • LPM • Business Owners • Epic Owners • Enterprise Arch 	<ul style="list-style-type: none"> • Product Owner • Sponsor • Coach
Headstart → Activate	Agile Readiness Forum	<ul style="list-style-type: none"> • RTE • Agile Coach • System Architect • HR • Finance 	<ul style="list-style-type: none"> • Scrum Master • Coach • HR Lead
Activate → Normalize	Delivery Council	<ul style="list-style-type: none"> • RTE • Product Management • Scrum Masters 	<ul style="list-style-type: none"> • Scrum Masters • Product Owners
Normalize → Grow	System Maturity Board	<ul style="list-style-type: none"> • LACE • Functional Heads • Portfolio PMO 	<ul style="list-style-type: none"> • Agile Coach • Department Heads
Grow → Evolve	Expansion Council	<ul style="list-style-type: none"> • Value Stream Engineers • LACE • Business Functions 	<ul style="list-style-type: none"> • Product Leadership • Agile Champions
Evolve → Commit (Loop)	Evolution Council	<ul style="list-style-type: none"> • Executives • LACE • Portfolio Governance 	<ul style="list-style-type: none"> • Executive Sponsor • Agile Governance Coach

Table 16 - Control gates participants (focus on Scrum and SAFe)

5.4 Integrating the CHANGE framework into Agile transformation models

The CHANGE framework is designed to complement, not replace, established Agile delivery methods, including both Scrum and SAFe (Scaled Agile Framework). While these frameworks define disciplined approaches for managing delivery at the team level (Scrum) or scaling Agile practices across programs and portfolios (SAFe), they often assume the existence of enabling conditions (e.g., strategic alignment, cultural readiness, structural support, and leadership sponsorship) that are not automatically present in complex organizations.

CHANGE fills this gap by focusing on the organizational transformation journey required to make Agile adoption successful and sustainable. It provides a structured model for managing alignment, experimentation, coordination, and system-wide adaptation across the enterprise. Its six iterative phases support the entire lifecycle of an Agile transformation, from initial commitment to long-term institutionalization.

This chapter explains how the CHANGE framework integrates with both Scrum and SAFe transformations across three key stages:

- **Pre-implementation:** the foundational setup required before Agile teams and configurations are activated
- **Implementation:** the operational phase where Agile routines (e.g., Scrum ceremonies or SAFe configurations) are deployed and refined
- **Scaling and institutionalization:** the stage where Agile becomes embedded across the organization, supported by structural, cultural, and leadership evolution

5.4.1 CHANGE support to a Scrum-Based Agile Transformation

By integrating with Scrum at each stage, whether before teams are formed, during their operation, or as they scale, the CHANGE framework ensures that Agile transformation is not limited to isolated team level improvements. It provides the scaffolding for strategic alignment, organizational learning, and systemic coherence. This combination allows enterprises to move from performing Agile rituals to achieving true business agility.

5.4.1.1 Pre-Implementation: Creating the conditions for Scrum adoption

The Commit and Headstart phases of the CHANGE framework align with the foundational work required before any Scrum team can operate effectively. Scrum assumes the presence of certain organizational enablers, such as empowered Product Owners, stable teams, and a backlog of work. In reality, these conditions are rarely present in unprepared environments.

In Commit, leadership defines the transformation vision and sets up governance. This ensures that the rationale for introducing Scrum is clearly linked to business outcomes and that executive sponsors are aligned on ownership, roles, and metrics.

In Headstart, the focus shifts to preparing the delivery environment:

- Agile training ensures that Scrum Masters, Product Owners, and Developers understand their roles
- Structural readiness assessments surface blockers such as fragmented teams or siloed ownership
- A first version of the Agile operating model defines how Scrum teams will coordinate across boundaries
- A Proof of Concept (PoC) compares Scrum to legacy delivery methods, providing a learning baseline

These preparatory activities enable the successful launch of Scrum teams with shared language, realistic expectations, and organizational support.

5.4.1.2 Implementation: Operating and iterating Scrum processes

The Activate and Normalize phases of the CHANGE framework guide the operationalization of Scrum and the stabilization of delivery practices.

In Activate, real Scrum teams begin delivering work using the core Scrum processes:

- Sprint Planning defines the Sprint Goal and selects Product Backlog items for the Sprint
- Daily Scrum allows Developers to inspect progress and adapt the plan daily
- Sprint Review enables the team and stakeholders to inspect the increment and adapt the Product Backlog
- Sprint Retrospective focuses on improving the team's process and collaboration

The CHANGE framework reinforces these processes by embedding support roles (such as Agile coaches), securing a backlog ready for incremental delivery, and establishing coordination mechanisms across teams. Retrospectives also serve as input for organizational improvement, extending beyond team-level reflection and feeding back into the CHANGE learning cycles.

In Normalize, the practices observed in pilots become codified:

- Scrum ceremonies are standardized across teams, enabling consistency and shared expectations

- Communities of Practice for Scrum Masters and Product Owners foster cross-team learning
- Support functions such as HR and Finance begin aligning with Agile cadence and roles
- Portfolio visibility mechanisms support backlog prioritization and cross-team synchronization

This phase ensures that Scrum is no longer isolated within pilot teams but becomes embedded across the delivery landscape.

5.4.1.3 Scaling and execution: Institutionalizing Scrum across the enterprise

The Grow and Evolve phases support the expansion of Scrum into broader enterprise functions and its evolution into a core operational model.

In Grow, new domains including marketing, legal, and risk are onboarded into the Agile way of working:

- New Scrum teams are launched with context-specific adaptations
- Successful patterns are replicated with customization instead of being imposed uniformly
- Product management roles are clarified across business and IT functions
- Value stream-based funding models replace traditional project financing

In Evolve, Scrum becomes institutionalized:

- System-level retrospectives are used to assess enterprise agility
- Incentives and KPIs are adapted to reward cross-functional outcomes and learning
- Governance structures are reshaped to support fast and decentralized decision-making
- Leadership evolves from directive control to coaching and enablement

At this stage, Scrum is no longer just a delivery method. It becomes a cultural norm embedded in how the organization thinks, prioritizes, and collaborates.

5.4.2 CHANGE support to a SAFe-Based Agile transformation

While SAFe offers a detailed blueprint for scaling Agile, it presumes a degree of organizational readiness that is rarely present. The CHANGE framework complements SAFe by ensuring that leadership, cultural alignment, structural readiness, and continuous learning are in place. By guiding organizations through the foundational, operational, and institutional phases of change, CHANGE enables SAFe to be adopted not just as a framework, but as a sustainable transformation approach.

5.4.2.1 Pre-Implementation: Creating the conditions for SAFe adoption

The Commit and Headstart phases of the CHANGE framework lay the groundwork for a successful SAFe transformation. SAFe requires prerequisites such as Lean-Agile leadership, Agile Release Trains (ARTs), and readiness for PI Planning. Without careful preparation, launching SAFe can lead to mechanical adoption without impact.

In Commit, the organization aligns on the need for SAFe:

- Define the transformation vision and connect it with enterprise-level outcomes
- Align senior leadership on Lean-Agile values and governance changes

- Establish initial governance structures including LACE (Lean Agile Center of Excellence)

In Headstart, the enterprise prepares for the launch of its first ART:

- Train leaders, Business Owners, RTEs (Release Train Engineers), Product Managers, and System Architects
- Conduct Value Stream and ART identification workshops
- Develop the initial Program Backlog
- Run a simulation or pilot of PI Planning to test readiness

Outputs from these phases include:

- Trained leadership and ART roles
- Identified value streams and launch-ready ARTs
- An enterprise-wide shared understanding of SAFe purpose and mechanics

5.4.2.2 Implementation: Launching and stabilizing SAFe structures

The Activate and Normalize phases guide the rollout of ARTs and the stabilization of core SAFe practices.

In Activate, the first ARTs are formally launched:

- Conduct real PI Planning events
- Execute Program Increments and Iterations with Inspect & Adapt workshops
- Establish ART ceremonies and synchronization rhythms
- Provide coaching to RTEs, Scrum Masters, and Product Owners

The CHANGE framework supports these steps by embedding transformation coaches and tracking systemic blockers emerging from the ART launch.

In Normalize, SAFe practices are refined and extended:

- Establish Communities of Practice for RTEs, Architects, and Business Owners
- Introduce Lean Portfolio Management mechanisms
- Begin shifting funding and governance toward Lean-Agile principles
- Expand DevOps and Continuous Delivery pipelines to support ART delivery

These phases ensure that SAFe becomes consistent, stable, and contextually adapted across early ARTs and value streams.

5.4.2.3 Scaling and institutionalization: Embedding SAFe in the enterprise operating model

The Grow and Evolve phases focus on expanding SAFe adoption and embedding Lean-Agile thinking at the systemic level.

In Grow, the organization moves from isolated ARTs to an enterprise-wide model:

- Launch new ARTs and Solution Trains based on success patterns
- Scale Lean Portfolio Management across strategic domains
- Involve additional business functions such as operations, HR, and compliance
- Tailor SAFe configurations to suit specific regulatory or customer contexts

In Evolve, SAFe is institutionalized:

- Establish regular Portfolio Syncs and Enterprise Inspect & Adapt sessions
- Adapt performance management and KPIs to incentivize flow and learning
- Evolve leadership behaviors and decision-making models
- Create a system of continuous improvement driven by data and retrospectives

At this point, SAFe is not just implemented but embedded as a core component of the enterprise's governance, structure, and culture.

5.5 Supporting the Telco Agile transformation with the CHANGE framework

This section explores how the CHANGE framework would have supported the international Telco operator described in the case study during its Scaled Agile transformation initiative.

The case study focused on a large-scale Agile transformation within the EP&S division of a global telecommunications operator, structured around the Scaled Agile Framework (SAFe). Despite the adoption of SAFe, the transformation encountered significant obstacles: unclear product backlogs, fragmented role responsibilities, weak business ownership, and misalignment between delivery execution and strategic governance. These frictions, widely observed in SAFe implementations, revealed a lack of organizational readiness and change enablement structures necessary for sustained agility.

The CHANGE framework would have supported this transformation by complementing SAFe with a dedicated execution model for managing organizational change. Its six iterative phases (Commit, Headstart, Activate, Normalize, Grow, and Evolve) would have provided the enterprise with a methodical way to align leadership, prepare key roles, validate early pilots, institutionalize shared practices, extend agility across functions, and embed long-term learning loops.

Unlike SAFe, which assumes a mature ecosystem ready to implement ARTs, PI Planning, and Lean Portfolio Management, the CHANGE framework explicitly manages the enabling conditions and cross-functional coordination that make such structures viable. It would have provided clarity on transformation ownership, designed coherent onboarding paths for non-technical functions, ensured role enablement before scaling, and promoted retrospectives at both team and executive levels to trigger systemic improvements.

Commit: Establishing strategic intent and transformation governance

In the early stages, the Telco's leadership did not clearly define the rationale or scope of adopting SAFe. There was limited shared understanding among business and IT stakeholders, and no unified narrative to align EP&S with the transformation.

How CHANGE would have supported:

- Facilitated strategic alignment workshops with C-level stakeholders to co-create a transformation vision
- Structured OKRs and strategic narratives that clearly linked SAFe to business outcomes such as faster time-to-market, improved NPS, and customer-centric product development
- Designed a cross-functional Transformation Leadership Team and established governance rituals for visibility and accountability

Functions involved:

- SAFe Portfolio stakeholders (Business Owners, Enterprise Architects)
- PMO leaders for transformation backlog setup
- Finance and HR for early funding and role adaptation

[Headstart: Preparing the organizational terrain for Agile](#)

During initial SAFe rollout, teams lacked role clarity, Product Owners were inconsistently empowered, and the organizational environment was not ready to support ARTs.

How CHANGE would have supported:

- Conducted a readiness assessment across business units to identify fragmented ownership, skill gaps, and structural impediments
- Delivered targeted training journeys for key roles (RTEs, POs, Scrum Masters, Architects) using real case simulations
- Designed the first version of the Agile Operating Model tailored to Telco-specific domains, including coordination between squads and release trains
- Piloted a controlled Proof of Concept comparing Agile and legacy project modes, using actual EP&S workflows to surface inefficiencies

Functions involved:

- Agile CoE for training and coaching deployment
- Architecture function for system alignment
- Business Unit Leaders for functional onboarding

[Activate: Validating Agile ways of working in delivery settings](#)

The transformation initiated ARTs broadly rather than iteratively. Many ARTs lacked backlog readiness and suffered from role duplication and unclear coordination mechanisms.

How CHANGE would have supported:

- Selected pilot ARTs based on business criticality and leadership sponsorship

- Embedded Agile Coaches within ARTs to run shadow PI Plannings and dry-run Inspect & Adapt workshops before official go-live
- Created role-specific coaching tracks for POs and Scrum Masters, enabling practice-based mentoring alongside execution
- Used Agile feedback loops from retrospectives and PI objectives to update the transformation backlog

Functions involved:

- SAFe Program roles (RTEs, Scrum Masters, System Architects)
- Business Line Managers to ensure backlog alignment
- Coaches and Change Agents

Normalize: Stabilizing execution and building structural coherence

In the Telco case, misalignments continued during execution. There were no shared ceremonies across trains, and support functions operated outside the Agile cadence.

How CHANGE would have supported:

- Institutionalized shared cadences across ARTs, synchronizing PI Planning and System Demos to build delivery cohesion
- Developed Communities of Practice across Product Owners and RTEs to co-create shared backlog practices and cadence rituals
- Aligned Finance, HR, and PMO with SAFe cycles to enable lean budgeting, role incentives, and time-aligned reporting
- Designed dashboards and value metrics using service-level feedback, not just velocity or burn-downs

Functions involved:

- SAFe Portfolio Management and Epic Owners
- Support functions (HR, Finance, Legal)
- Communities of Practice and Transformation Office

Grow: Scaling Agility beyond delivery teams

The transformation remained confined to delivery teams, failing to engage adjacent domains such as customer service, legal, and sales ops.

How CHANGE would have supported:

- Onboarded adjacent functions using lightweight Agile patterns and tailored ceremonies (e.g., weekly adaptive planning in Sales Engineering)
- Supported experimentation in non-tech domains with backlog templates, process enablers, and cross-functional pairing

- Coached new ARTs with localized adaptations rather than cloning previous setups
- Embedded LACE resources in newly onboarded business domains to reinforce cultural norms

Functions involved:

- Business Unit Heads and Domain Sponsors
- SAFe Value Stream Engineers
- Transformation Office and Agile Coaches

[Evolve: Embedding Agility in enterprise design and culture](#)

Despite formal adoption of SAFe, the Telco struggled to internalize Agile leadership models. Many decisions remained centralized, and old KPIs persisted.

How CHANGE would have supported:

- Facilitated executive retrospectives to assess leadership behaviors and alignment with Agile values
- Redefined incentive schemes around cross-functional success and learning velocity
- Redesigned governance rituals to prioritize flow efficiency, including reducing approval stages and integrating OKRs with PI objectives
- Conducted maturity scans bi-annually to inform transformation backlog refresh

Functions involved:

- Executive Committee and Strategy
- HR (leadership development, role evolution)
- Agile Portfolio Governance Teams

5.5.1 Final considerations on the application of CHANGE to the Telco company case study

The ACTIVE CHANGE framework would not have replaced SAFe in the Telco transformation but rather enabled it to function as intended. By addressing the preconditions, operational rhythms, and systemic shifts required to support Scaled agility, ACTIVE CHANGE would have ensured a resilient and adaptive transformation. Its phased model provides not only direction but also mechanisms to course-correct, institutionalize learning, and align business and IT in a sustained Agile operating model.

5.6 Positioning ACTIVE CHANGE within established organizational change theories

ACTIVE CHANGE can be positioned within the broader tradition of organizational change theory rather than being limited to the domain of Agile specific frameworks. Its structure and intent allow it to integrate naturally with established models such as Kotter Eight Step Change Model, the McKinsey 7S Framework, the ADKAR Model, and the Nadler Tushman Congruence Model. The goal of this section is to show how ACTIVE CHANGE relates to these reference models, where it aligns with their core assumptions, and in which areas it extends or operationalizes their principles in order to support large scale Agile transformations in complex enterprise contexts

5.6.1 Kotter Eight Step Change Model

Kotter Eight Step Change Model [75] is one of the most influential and widely adopted frameworks in organizational change management. It conceptualizes transformation as a structured and sequential process through which organizations build momentum, mobilize actors, and eventually embed new practices into the cultural fabric of the enterprise. The model is explicitly designed to reduce resistance, increase clarity, and create the collective energy needed to sustain change over time.

Its eight steps are articulated as follows

1. **Establish a sense of urgency:** The transformation begins by making the need for change visible and compelling. This includes identifying external pressures, internal performance gaps, or strategic risks that justify immediate action. Creating urgency helps overcome complacency and prepares the organization psychologically for disruption
2. **Form a guiding coalition:** Successful change requires a group of influential leaders and stakeholders capable of driving and legitimizing the transformation. This coalition combines authority, expertise, credibility, and political support, ensuring the initiative has the momentum and sponsorship needed to advance
3. **Create a vision for change:** A clear and coherent vision provides direction and meaning. It articulates what the organization aims to achieve and how the transformation will deliver value. The vision serves as a reference point for decision-making and helps align diverse actors around a shared aspiration
4. **Communicate the vision:** The vision must be communicated consistently and transparently across the organization. Effective communication ensures that employees understand the rationale for change, the expected benefits, and their own role in the journey, thus reducing uncertainty and fostering engagement
5. **Empower employees for broad-based action:** Barriers that inhibit change must be removed, including structural constraints, skill gaps, or conflicting incentives. Empowerment enables employees to take initiative, experiment, and contribute actively to the transformation process
6. **Generate short-term wins:** Visible early successes build credibility and reinforce commitment. Short-term wins demonstrate that the change is real and achievable, motivating stakeholders and reducing resistance by showing tangible progress
7. **Consolidate gains and produce more change:** After initial successes, the organization continues to accelerate change rather than declaring victory too early. This phase involves expanding the transformation, addressing deeper systemic issues, and ensuring that improvements are replicated across domains and functions
8. **Anchor new approaches in the culture:** For change to endure, new behaviors and practices must become part of the organizational identity. This requires embedding them in leadership expectations, governance mechanisms, performance systems, and shared values so that the transformation persists even after the initial program concludes

5.6.1.1 Integration of ACTIVE CHANGE with Kotter's Eight Step Change Model

ACTIVE CHANGE can be interpreted as the operational layer that enables Kotter's Eight Step Change Model to function effectively in environments characterized by high complexity, rapid learning cycles, and cross functional interdependence. Kotter offers a strategic narrative for mobilizing the organization, while ACTIVE

CHANGE provides the mechanisms, roles, and iterative loops required to translate that narrative into sustained transformation.

The early phases of Kotter's model, centered on establishing urgency, forming a guiding coalition, and defining a transformation vision, align naturally with the Commit phase and the Align with purpose principle in ACTIVE CHANGE. These elements ensure that the transformation is founded on a shared rationale, clear intent, and visible sponsorship. Unlike Kotter's linear progression, ACTIVE CHANGE reinforces these foundations continuously through structured governance and repeated alignment rituals.

As the transformation evolves, Kotter's focus on empowering people and removing obstacles finds practical expression in Co design the change and Invest in enablers. These components create the conditions for broad based participation, capability development, and the removal of structural or cultural constraints that typically impede Agile adoption. They operationalize empowerment by embedding support systems rather than relying solely on communication and symbolic gestures.

Kotter's emphasis on generating short term wins is reflected in the Test and learn principle and in the Activate phase of ACTIVE CHANGE, where controlled pilots and early delivery cycles generate visible progress and actionable insight. Normalize further stabilizes these gains, enabling the organization to consolidate learning before expanding the scope of change. This creates a more robust and evidence based foundation for scaling than what is typically envisaged in linear change programs.

The final step of Kotter's model, which centres on anchoring new behaviors in the culture, corresponds closely to the Evolve the system principle and the Evolve phase in ACTIVE CHANGE. These elements reshape governance, incentives, leadership norms, and operating structures, ensuring that Agile practices and mindsets become part of the organizational identity.

5.6.2 McKinsey 7S Framework

The McKinsey 7S Model [76] is a foundational framework for analyzing organizational effectiveness and guiding complex transformation initiatives. It conceptualizes the enterprise as an interconnected system composed of seven mutually reinforcing dimensions whose alignment determines strategic coherence, execution quality, and long term adaptability. The model highlights that change cannot succeed through structural adjustments alone but requires coordinated evolution across both hard and soft organizational levers. In the context of large scale Agile transformations, the 7S framework provides a diagnostic and integrative lens for understanding how ACTIVE CHANGE aligns structural design, leadership behaviors, cultural patterns, and capability development to sustain enterprise level agility.

The seven dimensions are articulated as follows

1. **Strategy:** This element concerns the organization's long term direction and competitive positioning. It defines how the enterprise intends to allocate resources, differentiate itself, and respond to environmental pressures. In a transformation context, strategic coherence ensures that Agile initiatives are not isolated experiments but expressions of a clear enterprise logic
2. **Structure:** This refers to the formal configuration of roles, reporting lines, and coordination mechanisms. Structural alignment determines how work flows and how authority is distributed. Agile transformations often require shifts from hierarchical forms toward networked, team centric arrangements supported by transparent decision pathways
3. **Systems:** Systems encompass the procedures, processes, and routines through which the organization operates. These include planning cycles, performance management, budgeting mechanisms, and delivery pipelines. For large scale Agile, systemic adaptation is essential to remove procedural bottlenecks and create enabling environments for iterative value delivery

4. **Shared Values:** At the center of the model lie the core beliefs and cultural norms that shape collective behavior. Shared values provide meaning, identity, and direction. Successful transformation depends on reinforcing cultural attributes such as customer centricity, learning orientation, psychological safety, and collaborative ownership
5. **Skills:** This dimension captures the capabilities, technical expertise, and practical know how present within the workforce. Agile transformations require investment in multidisciplinary skills, digital literacy, product management capabilities, and leadership competencies necessary to operate effectively in adaptive environments
6. **Style:** Style refers to leadership behaviors and managerial approaches. It influences trust, communication, empowerment, and decision making dynamics. Adaptive transformations require leadership styles that privilege coaching, transparency, and distributed authority rather than command driven control
7. **Staff:** Staff concerns workforce composition, talent allocation, and people development practices. Transformation necessitates matching individuals and teams to roles aligned with new operating models, while ensuring consistent investment in learning, motivation, and career pathways that sustain long term change

Through the lens of the McKinsey 7S Model, ACTIVE CHANGE can be positioned as a framework that ensures alignment across strategic intent, organizational architecture, cultural values, and human capabilities, enabling the enterprise to internalize agility as a systemic property rather than as a set of isolated practices.

5.6.2.1 Integration of ACTIVE CHANGE with the McKinsey 7S Model

ACTIVE CHANGE aligns with the holistic logic of the McKinsey 7S Model by translating the framework's emphasis on systemic alignment into a concrete pathway for guiding large scale Agile transformations. While the 7S Model provides an analytical map for understanding how strategy, structure, systems, style, staff, skills, and shared values interact, ACTIVE CHANGE operationalizes this map through phased progression, role based mechanisms, and iterative alignment cycles that enable enterprises to act deliberately on each dimension.

The first element, strategy, connects directly with the Headstart phase of ACTIVE CHANGE, where the transformation purpose, strategic intent, and value orientation are clarified. This phase ensures that Agile adoption is not framed as a delivery experiment but anchored in a coherent enterprise direction. Through strategic reframing and alignment rituals, ACTIVE CHANGE reinforces the McKinsey principle that no organizational change can succeed without strategic clarity.

The second element, structure, is progressively addressed during the Normalize, Grow, and Evolve phases. ACTIVE CHANGE realigns governance pathways, coordination layers, decision cycles, and portfolio logic so that the structure supports, rather than constrains, Agile behavior. This prevents the typical scenario in which new practices coexist with legacy organizational arrangements that dilute autonomy and slow adaptation.

The third element, systems, is strengthened through the Activate phase and through mechanisms such as Visualize progress. Planning routines, performance mechanisms, feedback cadences, and delivery processes are reframed to support iterative flow and empirical learning. ACTIVE CHANGE thereby ensures that systems become enablers of agility rather than procedural bottlenecks.

The fourth element, shared values, is nurtured systematically through Co design the change and through the work of the Culture Catalyst. These components reinforce the values base of the transformation by enabling collective sensemaking, transparency, and continuous learning. Over time, shared values converge around customer centricity, collaboration, and psychological safety, consistent with the 7S emphasis on cultural coherence.

The fifth element, skills, is addressed through the Invest in enablers principle and the ACE personas. ACTIVE CHANGE focuses on capability building for leadership, product roles, Agile coaches, and technical teams, ensuring that the workforce develops the competencies required to operate in adaptive environments. This capability development mitigates misalignments between redesigned work and existing skill sets.

The sixth element, style, is influenced through leadership coaching, sponsorship rituals, and modeling behaviors embedded throughout all phases. ACTIVE CHANGE fosters leadership styles that privilege facilitation, clarity, and distributed authority, moving away from directive patterns that limit team autonomy. This supports the 7S view that leadership behavior is a powerful determinant of organizational alignment.

The seventh element, staff, is addressed through workforce allocation practices, community structures, and talent alignment mechanisms introduced across the transformation. ACTIVE CHANGE ensures that people are placed in roles that match the emerging operating model and that career paths evolve to sustain engagement and long term motivation.

Taken together, these correspondences illustrate that ACTIVE CHANGE does not merely mirror the diagnostic depth of the McKinsey 7S Model. It provides a disciplined architecture for translating the seven elements into coordinated action, enabling the enterprise to evolve strategy, structure, systems, leadership, skills, staff, and values in a mutually reinforcing manner throughout the Agile transformation journey.

5.6.3 ADKAR model

ADKAR Model [77] is one of the most widely recognized frameworks for managing the human dimension of organizational change. In contrast to approaches that primarily focus on structures, processes, or strategies, ADKAR describes the sequence of psychological and capability related conditions that each individual must satisfy for change to be effectively adopted and sustained. The central assumption is that organizational transformation only occurs when a sufficient number of individuals progress through these stages. ADKAR therefore serves both as a diagnostic lens for understanding resistance and as a design tool for tailoring interventions that support people in moving from awareness to stable new behaviors

Its five components are articulated as follows

1. **Awareness:** Awareness refers to the individual understanding of why change is needed. It involves clarity regarding the drivers of change, the risks of not changing, and the rationale behind the transformation. Without awareness, individuals perceive change as arbitrary or imposed, which typically amplifies resistance and reduces engagement
2. **Desire:** Desire captures the individual willingness to participate in and support the change. It is influenced by personal motivations, perceived benefits, trust in leadership, and past experiences with change. While awareness explains the reasons for change, desire reflects the degree to which individuals internalize those reasons and choose to align their own interests with the transformation
3. **Knowledge:** Knowledge concerns the information and understanding required to implement the change. This includes knowledge of new processes, roles, tools, and behaviors, as well as the ability to translate abstract objectives into concrete actions. Without adequate knowledge, even motivated individuals struggle to act consistently with the new expectations
4. **Ability:** Ability refers to the actual capacity to perform the required behaviors in practice. It goes beyond theoretical understanding and encompasses skills, practice opportunities, availability of resources, and removal of practical constraints. Ability is typically developed through experience, coaching, and feedback, and it determines whether knowledge can be converted into reliable performance

5. **Reinforcement:** Reinforcement represents the mechanisms that stabilize the new behaviors over time, preventing regression to previous habits. It includes formal elements such as incentives, recognition, performance management, and governance, as well as informal elements like social norms and peer expectations. Effective reinforcement ensures that the new way of working becomes the default rather than a temporary deviation

5.6.3.1 Integration of ACTIVE CHANGE with the ADKAR Model

ACTIVE CHANGE can be positioned as a system level architecture that embeds and amplifies the individual level mechanisms described by the ADKAR Model. While ADKAR explains the psychological and capability conditions each person must satisfy for change to occur, ACTIVE CHANGE provides the organizational scaffolding, governance, and iterative pathways needed for these conditions to be created and sustained at scale. The two models therefore operate at complementary levels: ADKAR focuses on the individual transformation journey, whereas ACTIVE CHANGE ensures that the broader organizational environment consistently enables and reinforces that journey across teams, functions, and leadership layers.

The first two ADKAR components, Awareness and Desire, align closely with the Commit phase and the Align with purpose and Co design the change principles in ACTIVE CHANGE. Commit provides the strategic narrative and sponsorship required to generate widespread Awareness of why Agile transformation is necessary and what problems it seeks to address. Co design the change then supports the emergence of Desire by involving employees directly in shaping the transformation, reducing resistance, and creating a sense of ownership rather than compliance. In this way, ACTIVE CHANGE operationalizes the early ADKAR conditions not through one-way communication but through structured engagement, shared meaning-making, and participatory design.

The transition from Knowledge to Ability in ADKAR finds its organizational equivalent in the Headstart and Activate phases, as well as in the Invest in enablers principle. ACTIVE CHANGE ensures that training, coaching, and capability-building journeys are not episodic but systematically embedded within the transformation plan. Headstart provides the Knowledge foundations by standardizing language, clarifying roles, and introducing Agile operating models. Activate then creates the conditions for Ability by enabling people to apply new practices in real delivery settings, supported by coaching, feedback loops, and iterative refinement. ACTIVE CHANGE therefore transforms ADKAR's individual learning curve into a coordinated, organization-wide sequence of enablement activities.

Reinforcement, the final component of ADKAR, corresponds directly to the Normalize, Grow, and Evolve phases of ACTIVE CHANGE, as well as to the Evolve the system principle. Reinforcement in complex enterprises requires more than rewards or recognition; it demands coherent governance structures, aligned KPIs, institutionalized rituals, and the removal of legacy constraints that might pull people back toward old behaviors. ACTIVE CHANGE provides these systemic reinforcements by redesigning incentives, updating governance, synchronizing support functions, and embedding learning loops that perpetuate the transformation beyond the initial phases.

5.6.4 Nadler Tushman Congruence Model

Nadler Tushman Congruence Model [78] is one of the most influential system based frameworks for analysing organizational performance and guiding transformation. It conceptualizes the organization as an interconnected system in which outcomes depend not on isolated elements but on the degree of internal alignment among key components. The central premise is that effectiveness arises when the core elements of the organization reinforce rather than contradict one another, and that performance issues or resistance to change typically emerge from misalignments within the system. The model therefore provides a structured

way to diagnose where congruence is lacking and to understand how adjustments in one area—such as structure, roles, or cultural norms—affect the others.

Its four components are articulated as follows

1. **Work:** Work refers to the tasks, processes, and activities required to produce value. It includes the nature of the work, its level of complexity, the degree of interdependence among tasks, and the skills required to perform it effectively
2. **People:** People encompasses the individuals who perform the work, their skills, motivations, expectations, and the informal dynamics that shape their behavior. This component highlights the need to align human capabilities and motivations with the demands of the work
3. **Structure:** Structure represents the formal configuration of the organization, including reporting lines, coordination mechanisms, governance models, and allocation of responsibilities. It defines how work is divided, integrated, and managed across units and roles
4. **Culture:** Culture includes the shared values, norms, assumptions, and unwritten rules that influence how people behave and interpret the organization's environment. Culture acts as the informal logic of the system and can accelerate or constrain formal change initiatives

The underlying logic of the model is that high performance is achieved when work, people, structure, and culture are mutually consistent. When these elements are misaligned—such as when complex work is paired with rigid structures, or when cultural norms contradict strategic goals—organizations experience resistance, inefficiency, and failure to sustain change.

5.6.4.1 Integration of ACTIVE CHANGE with the Nadler Tushman Congruence Model

ACTIVE CHANGE aligns closely with the systemic logic of the Nadler Tushman Congruence Model, but extends it by providing a concrete, iterative pathway for restoring and sustaining alignment across work, people, structure, and culture during a large scale Agile transformation. Whereas the Congruence Model serves primarily as a diagnostic lens for identifying misfits within the organizational system, ACTIVE CHANGE provides the mechanisms, roles, and phased progression needed to act on those diagnoses and translate them into coordinated change across the enterprise.

The model's first component, work, corresponds directly to the design of Agile operating models introduced during the Headstart and Activate phases of ACTIVE CHANGE. These phases redefine how work flows through teams, value streams, and coordination layers, ensuring that delivery methods, decision cycles, and collaboration routines fit the nature of Agile tasks. By iterating on roles, backlog practices, and coordination mechanisms, ACTIVE CHANGE ensures that the nature of work is continuously realigned with Agile principles.

The second component, people, finds its counterpart in the ACE personas and in the Invest in enablers principle. ACTIVE CHANGE ensures that individuals have the skills, support, and leadership conditions required to perform Agile work effectively. Coaching, targeted capability building, and community structures strengthen alignment between people and the evolving demands of the Agile operating model. This reduces the behavioral and motivational misalignments that the Congruence Model predicts when people are not equipped to match the redesigned work.

The third component, structure, is operationalized through the Normalize, Grow, and Evolve phases. In these stages, ACTIVE CHANGE progressively realigns governance, reporting lines, portfolio management, funding logic, and enabling functions with Agile principles. This structural evolution prevents the common failure mode in Agile transformations where new ways of working coexist with legacy structures that constrain autonomy, slow decision-making, or reintroduce waterfall logic.

The fourth component, culture, is addressed systematically through Co design the change, Visualize progress, and the work of the Culture Catalyst. These mechanisms promote shared meaning, reinforce Agile values, and gradually reshape the norms and informal behaviors that govern day-to-day interactions. By embedding learning loops, transparency rituals, and leadership role modelling, ACTIVE CHANGE supports the emergence of cultural congruence that sustains transformation beyond formal structures.

Taken together, these alignments show that ACTIVE CHANGE does not merely diagnose misfits, as the Congruence Model does, but provides a structured and adaptive architecture for correcting them over time. It translates systemic insight into coordinated action, ensuring that work, people, structure, and culture evolve in a mutually reinforcing manner throughout the Agile transformation journey.

5.6.5 Remarks on the integration of ACTIVE CHANGE with traditional change models

The comparative analysis between ACTIVE CHANGE and the three foundational models of organizational transformation (Kotter Eight Step Change Model, the ADKAR Model, and the Nadler Tushman Congruence Model) highlights the complementary nature of these frameworks and clarifies the specific contribution that ACTIVE CHANGE brings to large scale Agile transformations.

Kotter provides a strategic and motivational pathway for mobilizing change, grounded in urgency, vision, coalition building, and cultural anchoring. ADKAR offers a detailed view of how individuals progress from awareness to stable behavioral reinforcement. The Nadler Tushman Congruence Model frames transformation as a systemic effort to ensure alignment between work, people, structure, and culture. Each of these models illuminates essential dimensions of organizational change, yet none offers a complete operational blueprint for managing the iterative, cross functional, and context dependent nature of Agile adoption in large enterprises.

ACTIVE CHANGE occupies this operational space. It translates the strategic clarity of Kotter, the behavioral insights of ADKAR, and the systemic perspective of the Congruence Model into a phased and adaptive architecture that guides organizations through the practical work of preparing, activating, stabilizing, scaling, and institutionalizing Agile ways of working. Its guiding principles support purpose, participation, experimentation, enablement, transparency, and system evolution, while its phased CHANGE model provides the iterative progression and feedback structures needed to manage nonlinear transformation dynamics.

The comparison shows that ACTIVE CHANGE does not replace traditional models but integrates their strengths into a cohesive framework suited for enterprise contexts where Agile introduces significant behavioral and structural discontinuities. Through this integration, ACTIVE CHANGE offers an approach capable of mobilizing people, aligning systems, and progressively reshaping organizational culture, making it particularly effective in environments characterized by complexity, interdependence, and the need for continuous learning and adaptation.

5.7 Managerial and strategic implications of the ACTIVE CHANGE framework

The application of the ACTIVE CHANGE framework generates a set of implications that extend beyond methodological considerations and directly influence how organizations govern, steer and sustain large scale Agile transformation. These implications vary significantly depending on the organizational context, particularly between highly digitalized companies and sectors subject to strict regulatory oversight.

5.7.1 Managerial implications and organizational impact in highly digitalized companies

The ACTIVE CHANGE framework offers a set of managerial implications that are particularly relevant for organizations operating in environments characterized by high levels of digitalization, rapid technological cycles and continuous pressure for adaptive capacity. In these contexts, managers play a central role in

translating the principles of the framework into operational reality, ensuring that transformation unfolds coherently across structures, routines and behaviors.

A first implication concerns the ability of managers to orchestrate iterative change rather than relying on linear transformation models. Highly digitalized companies require leaders capable of managing short adaptation cycles, continuously updating priorities, and steering teams through evolving conditions. ACTIVE CHANGE emphasizes this form of adaptive leadership by placing managers at the centre of feedback loops, where strategic intent must be aligned with operational learning emerging from delivery teams. Managers therefore need to cultivate mechanisms that make adaptation visible, timely and actionable.

A second implication relates to the redesign of coordination structures. Digitalized organizations often rely on multiple interconnected teams working on interdependent systems. ACTIVE CHANGE highlights the necessity for managers to evolve coordination modes from static reporting layers to dynamic interaction patterns. This involves enabling boundary spanning roles, ensuring that multi team synchronization routines are lightweight yet effective, and fostering shared visibility across product lines. These practices allow organizations to preserve autonomy at the team level while avoiding fragmentation at the system level.

A third implication concerns talent development and capability reinforcement. In fast changing digital ecosystems, organizations face constant skill renewal needs. ACTIVE CHANGE underscores the managerial responsibility to support ongoing capability building, not merely through formal training but through embedded learning structures, coaching ecosystems and communities of practice. Managers are required to create an environment in which expertise can scale horizontally across units and where learning becomes an intrinsic part of daily operations.

Another important implication derives from the cultural dimension of digitalized work. The framework highlights that cultural alignment is neither an ancillary outcome nor a supportive condition, but a central driver of transformation success. Managers must foster a culture that encourages experimentation, transparency and collective ownership of outcomes. This includes modelling desired behaviors, establishing rituals that sustain psychological safety, and reinforcing norms that privilege collaboration over optimisation of individual units.

Finally, ACTIVE CHANGE suggests a broader organizational impact that managers must anticipate and govern. Highly digitalized companies face continuous redefinition of roles, governance expectations and accountability models. Managers should be prepared to navigate these shifts by clarifying decision rights, redesigning performance systems to favor value delivery over activity volume and ensuring coherence between structural changes and strategic priorities. The framework provides guidance for managers to anticipate these systemic effects and to steer transformation in a way that preserves alignment across technological, organizational and human dimensions.

Through these implications, ACTIVE CHANGE positions managerial leadership as a decisive lever for achieving sustained adaptability in digitalized environments, offering a structured lens for guiding decisions that shape both organizational performance and long term transformation coherence.

5.7.2 Strategic implications for highly regulated sectors

In sectors characterized by stringent regulatory oversight such as public administration, telecommunications and media, and financial institutions, the ACTIVE CHANGE framework provides strategic guidance for navigating transformation under conditions where compliance, risk control and accountability exert a strong influence on organizational design and decision making. Unlike highly digitalized environments, where speed and iterative adaptation dominate managerial concerns, regulated sectors require transformation models that integrate agility with stability, traceability and institutional reliability.

A first implication concerns the alignment between adaptive practices and regulatory constraints. Organizations operating under sector specific mandates must demonstrate that changes in workflows, decision rights and system architecture remain fully compliant with external requirements. ACTIVE CHANGE supports this alignment by introducing mechanisms for incremental adjustment that preserve auditability and documentation integrity. This enables organizations to adopt iterative practices without compromising their ability to meet regulatory expectations related to security, continuity and data governance.

A second implication relates to the management of cross boundary interfaces. Regulated sectors often rely on complex networks of external authorities, supervisory bodies and policy stakeholders. The framework highlights the necessity for transformation leaders to maintain structured channels for institutional dialogue, ensuring that changes in organizational models are understood, anticipated and accepted by regulatory actors. This reduces the risk of misalignment between transformation trajectories and supervisory expectations, particularly when adopting new coordination mechanisms or shifting towards more autonomous team structures.

A third implication concerns risk management. In environments where operational, financial or societal risks are tightly monitored, ACTIVE CHANGE reinforces the need for decision making cycles that incorporate systematic risk sensing and mitigation. Transformation leaders must integrate adaptive routines with formal risk assessment practices, ensuring that experimentation is conducted within controlled boundaries and that deviations from expected outcomes are promptly addressed through established escalation paths.

Another implication involves the strengthening of organizational coherence during periods of structural change. Regulated sectors frequently operate with layered governance models, which can be sensitive to disruptions in reporting lines or role definitions. The framework emphasizes the importance of gradual reconfiguration, where shifts in governance, portfolio logic and accountability are synchronized with regulatory cycles and institutional dependencies. This sequencing allows organizations to introduce new ways of working without destabilizing established oversight mechanisms.

Finally, ACTIVE CHANGE points to the strategic necessity of cultivating institutional trust. Transformation efforts in regulated sectors are subjected to higher public scrutiny and require credibility in the eyes of both external regulators and internal compliance functions. Leaders must therefore prioritize transparency, traceability of decisions and consistent communication to stakeholders responsible for supervision. The framework helps build this trust by promoting clear visualization of progress, explicit articulation of rationale behind organizational changes and systematic involvement of compliance and legal functions in the early stages of transformation design.

Taken together, these implications demonstrate how ACTIVE CHANGE provides a structured path for reconciling agility with institutional accountability, enabling organizations in highly regulated sectors to adopt adaptive practices while maintaining compliance, risk control and public trust.

5.8 ACTIVE CHANGE empirical validation process

Although the ACTIVE CHANGE framework offers a structured and process oriented interpretation of large scale Agile transformation, its current formulation retains an explicitly conceptual nature. The framework synthesis patterns emerging from the literature and integrates them into a coherent sequence of phases, roles and feedback mechanisms, yet it has not been subjected to direct empirical validation in organizational settings. This means that, while theoretically grounded, its applicability, effectiveness and scalability have not been tested through longitudinal studies or controlled implementations. Acknowledging this limitation is essential to clarify the framework's current status within academic research and to delineate the trajectory for future inquiry.

The conceptual character of ACTIVE CHANGE does not diminish its value, but it does call for empirical studies capable of assessing its predictive capacity, practical usability and alignment with transformation realities across sectors and organizational structures. Such validation would allow researchers to determine whether the relationships hypothesized in the framework manifest consistently in practice, and whether the proposed phases operate as intended when exposed to real organizational pressures such as regulatory constraints, technical debt, entrenched cultural norms or portfolio interdependencies. Clarifying this boundary helps position ACTIVE CHANGE not as a prescriptive model already validated, but as a theoretically informed construct that requires systematic examination through empirical work.

5.8.1 Key metrics for future empirical validation of the framework

A future empirical validation of ACTIVE CHANGE can be supported through a structured set of quantitative and qualitative metrics, grouped into four complementary domains. Each metric is designed to be observable, comparable and measurable across organizational settings, enabling a rigorous assessment of how the framework performs in practice.

Process performance metrics

- **Iteration cadence stability:** Measures the regularity and predictability of planning and review cycles. Collected through sprint logs, release calendars and cadence adherence ratios
- **Feedback integration rate:** Indicates the percentage of retrospective or review insights that generate concrete adjustments in practices or governance. Measured through change logs or traceable improvement items
- **Flow continuity index:** Assesses interruptions, bottlenecks or delays across phases. Derived from work item ageing, cycle time variability and flow efficiency metrics

Team and role metrics

- **Role clarity score:** Captures the perceived understanding of responsibilities for key transformation roles. Measured through structured surveys or responsibility mapping assessments
- **Autonomy readiness level:** Evaluates a team's ability to take decisions without escalation. Derived from decision logs, dependency request frequencies and autonomy scales
- **Coordination density:** Measures the frequency and relevance of interactions between teams working on interdependent components. Computed through network analysis of meetings, communication exchanges and shared artefacts

Cultural and behavioral metrics

Psychological safety index: Assesses the extent to which individuals feel safe to express concerns, raise issues and experiment. Measured through validated psychological safety questionnaires

Transparency score: Evaluates how consistently progress, risks and objectives are made visible across teams. Derived from audits of dashboards, reporting practices and shared documentation

Change adoption sentiment: Captures qualitative perceptions regarding the transformation. Measured through interviews, focus groups or sentiment analysis of internal communication

Outcome and value metrics

- **Lead time variation:** Measures changes in end to end delivery time across the transformation journey. Extracted directly from workflow management systems
- **Value delivery reliability:** Assesses the predictability and stability of value increments delivered over time. Measured through throughput trends, realization rates and forecast accuracy

- **Strategic alignment score:** Evaluates the coherence between strategic priorities, portfolio decisions and team level execution. Derived from portfolio reviews and strategy execution mapping

5.8.1.1 Maturity model for organizational capability evaluation

To support future empirical studies, these metrics can be evaluated through a four level maturity model that describes the evolution of an organization’s capability to operate according to ACTIVE CHANGE principles.

- **Crawl:** The organization begins to introduce Agile practices but exhibits fragmented adoption. Metrics show inconsistent cadence, low feedback integration and unclear role boundaries. Psychological safety is fragile and coordination depends on informal interactions. Value delivery remains unpredictable. At this stage, the focus is on basic awareness and first stabilization of routines.
- **Walk:** The organization achieves initial stability across core practices. Iteration cadence becomes more regular, coordination mechanisms start to take shape and feedback is occasionally incorporated into decision making. Roles are clearer, although autonomy remains limited. Cultural indicators improve but remain uneven across units. Value delivery displays early signs of repeatability.
- **Run:** The organization demonstrates mature operational behavior aligned with the model. Cadence is stable, flow metrics improve and feedback loops effectively drive adaptation. Teams operate with greater autonomy and coordination is supported by formal, lightweight structures. Cultural indicators strengthen, with transparency becoming the norm. Delivery outcomes are predictable and strategically aligned.
- **Fly:** The organization fully embodies the adaptive logic described by ACTIVE CHANGE. Metrics display high stability, strong responsiveness and continuous improvement. Coordination across systems is seamless, autonomy is balanced with governance and cultural indicators reflect a deeply ingrained Agile mindset. Value delivery is both reliable and strategically integrated. At this stage, the organization becomes capable of sustaining and amplifying adaptive capacity at scale.

This maturity progression provides a structured lens through which future empirical studies can assess how organizations evolve when adopting ACTIVE CHANGE, and how effectively the framework’s mechanisms translate into observable organizational behavior.

5.8.2 Maturity trajectory enabled by the ACTIVE CHANGE framework

The transformation supported by ACTIVE CHANGE can be interpreted as a staged maturity trajectory in which organizations progressively evolve their structural, cultural and operational capabilities for scaled Agile adoption. The following maturity model articulates **six distinct stages**, each aligned with the transformative phases described in the implementation roadmap. These stages allow both researchers and practitioners to assess an organization’s current position and to understand the expected evolution over time.

Stage 1 – Awareness formation: The organization recognizes the limitations of its current delivery model and begins to explore the conceptual underpinnings of Agile at scale. Knowledge remains concentrated in a limited set of individuals and no structural adjustments have yet been undertaken. This stage corresponds to the preparatory activities of the initiation phase, where ACTIVE CHANGE provides orientation, baseline assessment and shared language.

Stage 2 – Readiness consolidation: Formal readiness assessments are conducted to evaluate cultural openness, structural constraints and leadership alignment. Early sponsor engagement emerges and initial transformation objectives are defined. This stage maps to the early segment of the initiation phase and marks the shift from abstract interest to structured intent.

Stage 3 – Pilot activation: A controlled pilot is launched, involving selected teams or value streams. Experimentation intensifies, but practices remain localized and governance structures are intentionally

lightweight. Learning cycles, feedback loops and ritual adjustments take shape. This stage corresponds fully to the pilot execution phase, where ACTIVE CHANGE provides mechanisms for reflection and guided adaptation.

Stage 4 – Structured expansion: Pilot learnings are codified and progressively extended to additional functions or units. Coordination mechanisms become more formalized, cross team dependencies are addressed and standardized routines begin to appear. This stage aligns with the initial part of the scaling and integration phase, where normalization and alignment principles of ACTIVE CHANGE guide systemic adjustments.

Stage 5 – Systemic scaling: The organization transitions from isolated expansions to a coherent, enterprise level operating model. Strategic governance, portfolio alignment and cross domain coordination are stabilized. Autonomy and interdependence are recalibrated and structural constraints are progressively removed. This stage corresponds to the advanced portion of the scaling and integration phase and reflects the organization’s ability to operate Agile at scale with internal consistency.

Stage 6 –Continuous adaptation: Scaled Agile becomes the dominant operating logic of the organization. Governance aligns dynamically with strategy, teams maintain stable autonomy, and continuous learning mechanisms sustain ongoing optimisation. Cultural reinforcement mechanisms, continuous capability development and strategic coherence define this stage. It corresponds to the enterprise wide adoption and consolidation phase of the roadmap, where ACTIVE CHANGE supports long term resilience and adaptation.

5.8.2.1 Alignment between maturity stages and implementation phases

The mapping between the implementation phases of ACTIVE CHANGE and the six stage maturity progression clarifies how organizational capability evolves during the transition toward a scaled Agile model. Each maturity stage represents a progressively higher degree of structural readiness, behavioral alignment and systemic coherence, while each corresponding phase of the roadmap expresses the concrete actions through which these capabilities take shape. The resulting alignment shows that the journey advances from initial awareness and diagnostic understanding, toward controlled experimentation and early standardization, and then into coordinated scaling and organizational embedding. This progression illustrates how an enterprise gradually develops the cultural, structural and operational conditions required to sustain agility at scale, and how ACTIVE CHANGE provides the scaffolding through which these conditions are enabled (Table 17).

Maturity stage	ACTIVE CHANGE phase	Organizational condition at this stage
Stage 1 Awareness formation	Initiation Exploration and framing	Awareness of current limitations; early interest in scaled Agile; no structural actions yet
Stage 2 Readiness consolidation	Initiation Readiness assessment and alignment	Formal assessment of culture, leadership and structure; definition of transformation intent and early sponsorship
Stage 3 Pilot activation	Pilot execution Controlled experimentation	Launch of an initial pilot involving selected teams; focus on learning cycles, feedback and adaptive refinement
Stage 4 Structured expansion	Scaling and integration Guided extension	Codification and extension of pilot learnings; introduction of coordination mechanisms; early standardization
Stage 5 Systemic scaling	Scaling and integration Enterprise alignment	Establishment of enterprise level governance, portfolio alignment and cross team coordination; coherent operating model emerging
Stage 6 Continuous adaptation	Adoption and consolidation Full operating state	Scaled Agile embedded across the organization; autonomous teams balanced with strategic coherence; continuous adaptation capabilities fully institutionalized

Table 17 - Alignment between ACTIVE CHANGE implementation phases and maturity levels

6 Research conclusions

Conclusion and future developments

Agile has evolved from a software delivery methodology to a strategic approach for managing complexity, accelerating value generation, and fostering adaptability in dynamic business environments. For large enterprises, Agile is not simply a set of practices to be Scaled, but a shift in how organizations coordinate, prioritize, and execute work across distributed structures. Its importance lies in enabling responsiveness without sacrificing alignment, and in promoting innovation while maintaining operational coherence.

However, scaling Agile across the enterprise introduces a distinct class of challenges. Structural inertia, fragmented governance, lack of role clarity, insufficient training, and weak stakeholder engagement often hinder Agile's ability to deliver sustained impact. These barriers are amplified in regulated industries, legacy environments, and large multi-team ecosystems. At the same time, empirical evidence points to a core set of success factors that consistently enable effective Agile transformation: strong leadership sponsorship, tailored coaching and training, cross-functional team engagement, cultural alignment, and structured transition mechanisms.

Answer to RQ1 - Key success factors and challenges: The findings of this research demonstrate that leadership sponsorship and commitment are foundational to overcoming resistance to change. Training and coaching emerged as critical to closing the knowledge gap that often weakens Agile adoption. Team engagement and involvement proved decisive in overcoming the complexity of multi-team coordination, while cultural communication was essential to reduce resistance and misalignment. Conversely, the most recurrent challenges included high-level requirement management, turbulence in transition phases, difficulties in multi-team synchronization, and partial or mechanical adoption of frameworks. These challenges, consistently observed in the survey and case study, highlight that the barriers to large-scale Agile transformation are less technical and more organizational, rooted in governance complexity, stakeholder alignment, and inadequate role clarity.

Answer to RQ2 - Most impacted domains: The research further revealed that large-scale Agile transformations impact several organizational domains simultaneously. The most critical were:

- **Organization and Skills**, as role clarity, capability building, and career path definition emerged as necessary enablers of scalable structures
- **Product Lifecycle Management (PLCM)**, which provided a harmonized model for product definition, development, and retirement, ensuring traceability and reusability across geographies and portfolios
- **Governance and Finance**, which required substantial adaptation to ensure lean budgeting, portfolio-level transparency, and coherent investment allocation
- **Ways of Working and SAFe implementation**, which reshaped delivery methods and coordination routines across Agile Release Trains. These domains were not siloed but highly interdependent: governance required stable roles, PLCM needed alignment with delivery frameworks, and training acted as a connective enabler across all dimensions.

This research has validated and expanded these insights through three complementary lenses. The systematic literature review has confirmed that success factors are well-documented but often generalized, with limited attention to organizational heterogeneity and sectoral context. The enterprise survey, involving companies of various sizes and sectors, has demonstrated that transformation outcomes are influenced by company dimension, maturity stage, and industry-specific characteristics. Industrial and mid-sized companies outperform TMT and Financial Services in early-stage adoption, while larger organizations experience

persistent challenges in transition, coordination, and knowledge dissemination. The case study on a multinational telecom operator has highlighted the critical role of contextual adaptation, disciplined execution, and organizational stability in achieving sustainable Agile outcomes. Where Agile practices were mechanically applied, impact remained superficial; where they were tailored to business dynamics and stakeholder configurations, benefits became structural.

In response to these findings, the research introduces the ACTIVE CHANGE framework, a diagnostic and design model for enabling scalable Agile transformations. Rather than offering a prescriptive methodology, it functions as a meta-framework that guides leaders, transformation teams, and organizational designers in assessing preconditions, structuring interventions, and adapting Agile practices to the realities of large, dynamic enterprises.

The framework is structured around six interconnected dimensions:

- **Alignment** ensures that Agile is not treated as an isolated IT initiative but is embedded within the strategic planning and execution cycles of the entire organization. This requires reconciling product roadmaps with enterprise priorities, aligning OKRs and budgeting cycles, and fostering collaboration between business units and delivery teams. Misalignment often leads to backlog fragmentation, duplicated effort, or disillusionment with Agile as a delivery vehicle.
- **Contextualization** addresses the fact that no two organizational units operate under the same structural, cultural, or regulatory conditions. Rather than enforcing uniform frameworks like SAFe or LeSS across the enterprise, ACTIVE CHANGE advocates for modular adaptation: tailoring cadences, ceremonies, team structures, and governance layers to the specific constraints and maturity levels of each business context. This dimension helps prevent both under-implementation and over-bureaucratization of Agile practices.
- **Training** moves beyond foundational certification courses and emphasizes role-based learning pathways that differentiate between the needs of senior leaders, mid-level managers, Agile coaches, and cross-functional teams. It also includes mechanisms for continuous knowledge transfer, such as peer mentoring, internal communities of practice, and just-in-time learning platforms. Without targeted capability building, Agile adoption risks stagnating at the surface level.
- **Involvement** focuses on the proactive engagement of those typically left out of formal transformation programs: line managers, technical leaders, and frontline contributors. The framework highlights the need to co-create Agile journeys rather than impose them, using facilitation tools, feedback loops, and internal advocacy networks to build grassroots momentum. Involvement also strengthens psychological ownership and reduces resistance during transition phases.
- **Validation** provides the evidence layer required to sustain Agile change. It emphasizes the collection and interpretation of both qualitative and quantitative indicators, tracking performance not only through velocity and delivery metrics but also through employee sentiment, team stability, and alignment with customer outcomes. This dimension ensures that Agile remains accountable and adaptive, rather than dogmatic.
- **Execution** operationalizes Agile through disciplined application of roles, rituals, and governance routines. It addresses the risks of mechanical adoption by stressing the quality, not just the presence, of Agile ceremonies. It also incorporates the design of escalation paths, coordination layers across teams-of-teams, and mechanisms for portfolio governance. Effective execution sustains the transformation rhythm and prevents regression into ad hoc delivery.

The ACTIVE CHANGE framework is designed to be iterative, diagnostic, and scalable. It can be used as a baseline maturity assessment, a roadmap design toolkit, or a retrospective lens to reflect on transformation progress. Its strength lies in recognizing that Agile at scale is not a product to be delivered but a capability to be nurtured, shaped by context, commitment, and continuous learning.

6.1 Future development

Future directions for the ACTIVE CHANGE framework and this research are both theoretical and practical:

- **Academic positioning:** Further research could aim to situate ACTIVE CHANGE within the broader academic discourse of organizational change management, exploring intersections with theories such as organizational ambidexterity [79], complexity science, and dynamic capabilities. This would deepen the conceptual foundation of the framework and enable scholarly debate on its comparative value.
- **Comparative validation:** Empirical studies could test ACTIVE CHANGE against other models such as SAFe, ADKAR [77], or Kotter's 8-step model [80]. Comparative research would help assess its strengths and limitations in different organizational contexts, providing a robust evidence base for its adoption.
- **Toolbox industrialization:** ACTIVE CHANGE could evolve into a platform-based toolkit tailored for enterprise transformation offices. This toolkit may include maturity heatmaps, stakeholder alignment diagnostics, modular playbooks, benchmarked KPIs, and facilitation canvases that support leaders in designing, piloting, and scaling interventions.
- **Role-specific enablement:** The framework could be enriched with enablement journeys specific to different organizational roles (e.g., executives, scrum masters, business owners), helping tailor the transformation to local responsibilities and capabilities.
- **AI-powered decision support:** Integration with AI offers promising opportunities. Machine learning models could analyze Agile telemetry (e.g., from Jira, Azure DevOps) and survey data to predict transformation risks, highlight team health signals, or simulate impact scenarios in near-real time.
- **Expansion to adjacent domains:** ACTIVE CHANGE could be extended to support broader transformation agendas, such as DevOps implementations, product operating model redesigns, or cloud migration programs. These adjacent initiatives share Agile DNA but differ in governance and cultural requirements, making the framework's contextual approach valuable.
- **Ecosystem integration:** The framework could be positioned within a broader ecosystem of enterprise transformation methodologies, integrating with tools like OKR platforms, business architecture suites, or enterprise Agile planning systems. This would elevate its operational relevance.
- **Continuous refinement through community:** A practitioner community could be developed to share learnings, success stories, and adaptations of ACTIVE CHANGE across sectors. This open learning loop would allow the framework to evolve dynamically through field-tested insights.

In conclusion, the ACTIVE CHANGE framework serves as a foundational meta-framework for enterprise agility. Its future lies in its ability to evolve through theoretical expansion, empirical validation, digital augmentation, and community adoption toward becoming a versatile companion for managing complex, multidimensional transformations.

Bibliography

1. Vial, G., *Understanding digital transformation: A review and a research agenda*. The journal of strategic information systems, 2019. **28**(2): p. 118-144.
2. Appelbaum, S.H., et al., *The challenges of organizational agility (part 1)*. Industrial and Commercial Training, 2017. **49**(1): p. 6-14.
3. Dikert, K., M. Paasivaara, and C. Lassenius, *Challenges and success factors for large-scale agile transformations: A systematic literature review*. Journal of Systems and Software, 2016. **119**: p. 87-108.
4. Abrar, M.F., et al., *Motivators for large-scale agile adoption from management perspective: A systematic literature review*. Ieee Access, 2019. **7**: p. 22660-22674.
5. Papaioannou, D., A. Sutton, and A. Booth, *Systematic approaches to a successful literature review*. Systematic approaches to a successful literature review, 2016: p. 1-336.
6. Moe, N.B. and T. Dingsøy. *Emerging research themes and updated research agenda for large-scale agile development: a summary of the 5th international workshop at XP2017*. in *Proceedings of the XP2017 Scientific Workshops*. 2017.
7. Koehnemann, H. and M. Coats. *Experiences applying agile practices to large systems*. in *2009 Agile Conference*. 2009. IEEE.
8. Moore, E. and J. Spens. *Scaling agile: Finding your agile tribe*. in *Agile 2008 Conference*. 2008. IEEE.
9. Demšar, J., et al., *Orange: data mining toolbox in Python*. the Journal of machine Learning research, 2013. **14**(1): p. 2349-2353.
10. Theobald, S., A. Schmitt, and P. Diebold. *Comparing scaling agile frameworks based on underlying practices*. in *International Conference on Agile Software Development*. 2019. Springer.
11. Brown, A.W., S. Ambler, and W. Royce. *Agility at scale: economic governance, measured improvement, and disciplined delivery*. in *2013 35th International Conference on Software Engineering (ICSE)*. 2013. IEEE.
12. Paasivaara, M. and C. Lassenius. *Scaling scrum in a large globally distributed organization: A case study*. in *2016 IEEE 11th International Conference on Global Software Engineering (ICGSE)*. 2016. IEEE.
13. Brenner, R. and S. Wunder. *Scaled Agile Framework: Presentation and real world example*. in *2015 IEEE eighth international conference on software testing, verification and validation workshops (icstw)*. 2015. IEEE.
14. Jacobson, I., et al., *Better scrum through essence*. Software: Practice and Experience, 2022. **52**(6): p. 1531-1540.
15. Smite, D., et al., *Spotify guilds: how to succeed with knowledge sharing in large-scale agile organizations*. Ieee Software, 2019. **36**(2): p. 51-57.
16. Crick, C. and E.K. Chew, *Business processes in the agile organisation: a socio-technical perspective*. Software & Systems Modeling, 2017. **16**: p. 631-648.
17. Kalenda, M., P. Hyna, and B. Rossi, *Scaling agile in large organizations: Practices, challenges, and success factors*. Journal of Software: Evolution and Process, 2018. **30**(10): p. e1954.
18. Horlach, B., I. Schirmer, and P. Drews, *Agile portfolio management: design goals and principles*. 2019.
19. Senapathi, M. and M.L. Drury-Grogan, *Refining a model for sustained usage of agile methodologies*. Journal of Systems and Software, 2017. **132**: p. 298-316.

20. Olszewska, M., et al., *Quantitatively measuring a large-scale agile transformation*. Journal of Systems and Software, 2016. **117**: p. 258-273.
21. Iivari, J. and N. Iivari, *The relationship between organizational culture and the deployment of agile methods*. Information and software technology, 2011. **53**(5): p. 509-520.
22. Lalsing, V., S. Kishnah, and S. Pudaruth, *People factors in agile software development and project management*. International Journal of Software Engineering & Applications, 2012. **3**(1): p. 117.
23. Sharma, S., D. Sarkar, and D. Gupta, *Agile processes and methodologies: A conceptual study*. International journal on computer science and Engineering, 2012. **4**(5): p. 892.
24. Rouvrais, S. and G. Landrac. *Resistance to Change in Institutionalizing the CDIO Standards: From a Waterfall to and Agile Improvement Model*. in *8th International CDIO Conference*. 2012.
25. Mohanarangam, K., *Transitioning to agile—in a large organization*. IT Professional, 2020. **22**(2): p. 67-72.
26. Schuch, F., et al., *Implementing Scaled-Agile Frameworks at Non-Digital Born Companies-A Multiple Case Study*. 2020.
27. Santos, P.d.O. and M.M. de Carvalho, *Exploring the challenges and benefits for scaling agile project management to large projects: a review*. Requirements engineering, 2022: p. 1-18.
28. Gandomani, T.J., et al., *The impact of inadequate and dysfunctional training on agile transformation process: A grounded theory study*. Information and Software Technology, 2015. **57**: p. 295-309.
29. Pavlič, L. and M. Heričko. *Agile coaching: the knowledge management perspective*. in *Knowledge Management in Organizations: 13th International Conference, KMO 2018, Žilina, Slovakia, August 6–10, 2018, Proceedings 13*. 2018. Springer.
30. Rolland, K.H. *Scaling across knowledge boundaries: A case study of a large-scale agile software development project*. in *Proceedings of the scientific workshop proceedings of xp2016*. 2016.
31. Bass, J.M. *Agile method tailoring in distributed enterprises: Product owner teams*. in *2013 IEEE 8th international conference on global software engineering*. 2013. IEEE.
32. Azizyan, G., M.K. Magarian, and M. Kajko-Matsson. *Survey of agile tool usage and needs*. in *2011 agile conference*. 2011. IEEE.
33. Dumitriu, F., G. Meșniță, and L.-D. Radu, *Challenges and Solutions of Applying Large-Scale Agile at Organizational Level*. Informatica Economica, 2019. **23**(3).
34. Power, K. *A model for understanding when scaling agile is appropriate in large organizations*. in *Agile Methods. Large-Scale Development, Refactoring, Testing, and Estimation: XP 2014 International Workshops, Rome, Italy, May 26-30, 2014, Revised Selected Papers 15*. 2014. Springer.
35. Girma, M., N.M. Garcia, and M. Kifle. *Agile scrum scaling practices for large scale software development*. in *2019 4th International Conference on Information Systems Engineering (ICISE)*. 2019. IEEE.
36. Neumer, J., S. Porschen-Hueck, and S. Sauer, *REFLEXIVE SCALING AS A WAY TOWARDS AGILE ORGANIZATION*. Journal of International Management Studies, 2018. **18**(2).
37. Nyruud, H. and V. Stray. *Inter-team coordination mechanisms in large-scale agile*. in *Proceedings of the XP2017 scientific workshops*. 2017.
38. Moe, N.B., et al. *Team autonomy in large-scale agile*. in *Proceedings of the Annual Hawaii International Conference on System Sciences (HICSS)*. 2019. AIS Electronic Library.
39. Paasivaara, M. *Adopting SAFe to scale agile in a globally distributed organization*. in *2017 IEEE 12th International Conference on Global Software Engineering (ICGSE)*. 2017. IEEE.

40. Gren, L., A. Goldman, and C. Jacobsson, *Agile ways of working: a team maturity perspective*. Journal of Software: Evolution and Process, 2020. **32**(6): p. e2244.
41. Alsaqaf, W., M. Daneva, and R. Wieringa, *Quality requirements challenges in the context of large-scale distributed agile: An empirical study*. Information and software technology, 2019. **110**: p. 39-55.
42. Ormsby, M. and C. Busby-Earle. *Agile Scaled Steps of Doneness: A Standardized Procedure to Conceptualizing and Completing User Stories Across Scrum Teams and Industries*. in *Evaluation of Novel Approaches to Software Engineering: 14th International Conference, ENASE 2019, Heraklion, Crete, Greece, May 4–5, 2019, Revised Selected Papers 14*. 2020. Springer.
43. Kula, E., et al., *Factors affecting on-time delivery in large-scale agile software development*. IEEE Transactions on Software Engineering, 2021. **48**(9): p. 3573-3592.
44. Moyon, F., et al. *Towards continuous security compliance in agile software development at scale*. in *Proceedings of the 4th International Workshop on Rapid Continuous Software Engineering*. 2018.
45. Fitzgerald, B., et al. *Scaling agile methods to regulated environments: An industry case study*. in *2013 35th International Conference on Software Engineering (ICSE)*. 2013. IEEE.
46. Amjad, S., et al., *Calculating completeness of agile scope in scaled agile development*. IEEE Access, 2017. **6**: p. 5822-5847.
47. Theobald, S. and A. Schmitt. *Dependencies of agile teams—an analysis of the scaled agile framework*. in *International Conference on Agile Software Development*. 2020. Springer.
48. Russo, D., *The agile success model: a mixed-methods study of a large-scale agile transformation*. ACM Transactions on Software Engineering and Methodology (TOSEM), 2021. **30**(4): p. 1-46.
49. Bass, J.M., *How product owner teams scale agile methods to large distributed enterprises*. Empirical software engineering, 2015. **20**: p. 1525-1557.
50. Henriquez, V., A.M. Moreno, and S. Gutiérrez, *Organizational training in agile settings under the lens of CMMI V2. 0*. Journal of Software: Evolution and Process, 2023. **35**(9): p. e2502.
51. Uludağ, Ö. and F. Matthes. *Identifying and documenting recurring concerns and best practices of agile coaches and scrum masters in large-scale agile development*. in *Proceedings of the 26th International Conference on Pattern Languages of Programs*. ACM. 2019.
52. Kärki, A., *The impact of education and training in large-scale agile transformation*. 2020, A. Kärki.
53. Diebold, P., A. Schmitt, and S. Theobald. *Scaling agile: how to select the most appropriate framework*. in *Proceedings of the 19th international conference on agile software development: companion*. 2018.
54. Rolland, K.H., V. Mikkelsen, and A. Næss. *Tailoring agile in the large: Experience and reflections from a large-scale agile software development project*. in *Agile Processes, in Software Engineering, and Extreme Programming: 17th International Conference, XP 2016, Edinburgh, UK, May 24-27, 2016, Proceedings 17*. 2016. Springer International Publishing.
55. Poth, A., M. Kottke, and A. Riel. *Scaling agile—a large enterprise view on delivering and ensuring sustainable transitions*. in *Advances in Agile and User-Centred Software Engineering: Third International Conference on Lean and Agile Software Development, LASD 2019, and 7th Conference on Multimedia, Interaction, Design and Innovation, MIDI 2019, Leipzig, Germany, September 1–4, 2019, Revised Selected Papers 3*. 2020. Springer.
56. Laanti, M. *Agile transformation model for large software development organizations*. in *Proceedings of the XP2017 Scientific Workshops*. 2017.
57. Laanti, M. *Characteristics and principles of scaled agile*. in *Agile Methods. Large-Scale Development, Refactoring, Testing, and Estimation: XP 2014 International Workshops, Rome, Italy, May 26-30, 2014, Revised Selected Papers 15*. 2014. Springer.

58. Scheerer, A., T. Hildenbrand, and T. Kude. *Coordination in large-scale agile software development: A multiteam systems perspective*. in *2014 47th Hawaii international conference on system sciences*. 2014. IEEE.
59. Moe, N.B., et al., *Finding the sweet spot for organizational control and team autonomy in large-scale agile software development*. *Empirical Software Engineering*, 2021. **26**(5): p. 101.
60. Martini, A., L. Pareto, and J. Bosch. *Communication factors for speed and reuse in large-scale agile software development*. in *Proceedings of the 17th international software product line conference*. 2013.
61. Grundler, A. and M. Westner. *Scaling Agile Frameworks vs. Traditional Project Portfolio Management: Comparison and Analysis*. in *Proceedings of the International Conferences on Internet Technologies & Society (ITS 2019), Hongkong*. 2019.
62. Zhang, H., et al. *Agile research studios: Orchestrating communities of practice to advance research training*. in *Proceedings of the 2017 ACM Conference on Computer Supported Cooperative Work and Social Computing*. 2017.
63. Ahrend, J., *SAFe® 6.0 im Unternehmen implementieren: Lean und Agile erfolgreich skalieren*. 2023: MITP-Verlags GmbH & Co. KG.
64. Kolasani, S., *Innovations in digital, enterprise, cloud, data transformation, and organizational change management using agile, lean, and data-driven methodologies*. *International Journal of Machine Learning and Artificial Intelligence*, 2023. **4**(4): p. 1-18.
65. Mohiuddin Babu, M., et al., *The role of artificial intelligence in shaping the future of Agile fashion industry*. *Production Planning & Control*, 2022: p. 1-15.
66. Braun, V., et al., *The online survey as a qualitative research tool*. *International journal of social research methodology*, 2021. **24**(6): p. 641-654.
67. Brosnan, K., A. Kemperman, and S. Dolnicar, *Maximizing participation from online survey panel members*. *International Journal of Market Research*, 2021. **63**(4): p. 416-435.
68. Van Quaquebeke, N., et al., *Conducting organizational survey and experimental research online: From convenient to ambitious in study designs, recruiting, and data quality*. *Organizational Psychology Review*, 2022. **12**(3): p. 268-305.
69. Saragih, L.R., M. Dachyar, and T.Y.M. Zagloel, *Implementation of telecommunications cross-industry collaboration through agile project management*. *Heliyon*, 2021. **7**(5).
70. Kuo-Wen, W. *How Does Hybrid Project Management Create Value for Telecommunication Industry? in Proceeding of Japan International Business and Management Research Conference*. 2020.
71. Simpson, B.D., et al., *Leveraging big data for agile transformation in technology firms: Implementation and best practices*. *Engineering Science & Technology Journal*, 2024. **5**(6): p. 1952-1968.
72. Annosi, M.C., et al., *Logics' shift and depletion of innovation: A multi-level study of agile use in a multinational telco company*. *Information and Organization*, 2022. **32**(3): p. 100421.
73. Yin, R.K., *Qualitative research from start to finish*. 2015: Guilford publications.
74. Gioia, D.A., K.G. Corley, and A.L. Hamilton, *Seeking qualitative rigor in inductive research: Notes on the Gioia methodology*. *Organizational research methods*, 2013. **16**(1): p. 15-31.
75. Kotter, J.P., *Leading change: Why transformation efforts fail*, in *Museum management and marketing*. 2007, Routledge. p. 20-29.
76. Salvarli, M.S. and D. Kayiskan, *An analysis of McKinsey 7-S model and its application on organizational efficiency*. *International Journal of Scientific and Technological Research*, 2018. **4**(7): p. 103-111.

77. Hiatt, J., *ADKAR: a model for change in business, government, and our community*. 2006: Prosci.
78. Nadler, D.A. and M.L. Tushman, *A model for diagnosing organizational behavior*. *Organizational dynamics*, 1980. **9**(2): p. 35-51.
79. O'Reilly III, C.A. and M.L. Tushman, *Organizational ambidexterity: Past, present, and future*. *Academy of management Perspectives*, 2013. **27**(4): p. 324-338.
80. Kotter, J.P., *Leading change*. 2012: Harvard business press.

Annex 1 – Agile framework comparison (detailed view)

Disciplined Agile Delivery (DAD)

- **Focus:** Comprehensive lifecycle from inception to post-production
- **Methodologies Incorporated:** Scrum, XP, UP, Kanban
- **Scale:** Tactical and strategic agility at both team and organizational levels
- **People:** Emphasizes roles rather than job titles, focusing on the human-centric nature of Agile teams.
- **Infrastructure:** Allows for modifiable infrastructure to better suit Agile methods, including both hardware and software requirements.
- **Technology:** DAD's flexible architecture allows various technologies that can enhance Agile processes. Its focus on solution architecture provides room for optimizing user experience and interface design.
- **Culture:** Encourages an adaptive, learning culture that aligns with Agile principles.
- **Processes and Lifecycle Phases:** Incorporates a variety of Agile methods, allowing for process adaptability. The life cycle comprises three main phases: Inception, Construction, and Transition.
- **Goals:** Clearly defines both business and technical goals, offering a balanced transformation journey.

Large-Scale Scrum (LeSS)

- **Focus:** Scaling Scrum for large projects and multiple locations
- **Methodologies Incorporated:** Scrum and other Agile practices
- **Scale:** Up to 8 teams of 8 members each; LeSS Huge for larger scale
- **People:** Focuses on feature teams over component teams, emphasizing human interaction and cross-functionality.
- **Infrastructure:** LeSS usually starts by assessing the existing infrastructure and recommending incremental improvements.
- **Technology:** In LeSS, technology choices are left open, emphasizing technologies that augment Agile values and principles. It necessitates a technology stack that facilitates rapid iterations and fosters a good user experience.
- **Culture:** Advocates for a culture of empowerment and decentralized leadership.
- **Processes and Lifecycle Phases:** Recommends simplifying processes to the most empirical and lean forms. Lifecycle phases are not explicitly defined but are based on Scrum.
- **Goals:** Aligns team goals with organizational objectives, facilitating cohesive transformation.

Nexus

- **Focus:** Coordination of multiple Scrum teams (3-9)
- **Methodologies Incorporated:** Scrum
- **Scale:** Medium-sized projects with ideally 3 to 9 Scrum teams
- **People:** Emphasizes role clarity and inter-team coordination.
- **Infrastructure:** Built to extend existing Scrum frameworks, Nexus integrates seamlessly into existing infrastructures.

- **Technology:** Nexus falls within the Scrum framework, which typically employs technologies that facilitate iterative development. Nexus places an emphasis on tooling that can assist in managing dependencies and that complements human interactions.
- **Culture:** Supports a collaborative culture, with an emphasis on removing cross-team dependencies.
- **Processes and Lifecycle Phases:** Retains Scrum's iterative processes while extending them for scaling. Adds exploration of dependencies and synchronisms to the life cycle.
- **Goals:** Focuses on creating a single product backlog to align all teams to shared goals.

Scaled Agile Framework (SAFe)

- **Focus:** Large-scale Agile development
- **Methodologies Incorporated:** Scrum, Lean, XP
- **Scale:** Three levels (Team, Program, and Portfolio)
- **People:** Focuses on creating Agile teams with clearly defined roles such as Product Manager, System Architect, and Release Train Engineer.
- **Infrastructure:** Advocates for an IT environment that is robust yet flexible, capable of supporting various Agile roles and processes.
- **Technology:** SAFe Lean-Agile principles emphasize technologies that enable continuous delivery and DevOps culture. This aligns well with the principle of augmenting Agile processes through suitable technology, while also emphasizing user interface and experience design.
- **Culture:** Encourages a Lean-Agile transformation, facilitating a culture that values adaptability and a customer-centric focus.
- **Processes and Lifecycle Phases:** Processes in SAFe are built around Agile Release Trains (ARTs) with specific timeboxes, emphasizing iterative and incremental development.
- **Goals:** Goals are aligned with business outcomes, with a strong emphasis on customer-centricity and delivering value.

Scrum at Scale

- **Focus:** Scaling Scrum for complex projects
- **Methodologies Incorporated:** Scrum
- **Scale:** Linear scalability with multiple Scrum teams
- **People:** Focuses on cross-functional and self-organizing teams, led by Scrum Masters and Product Owners.
- **Infrastructure:** Does not prescribe a specific infrastructure but assumes the existing one can be adapted for scaled Scrum.
- **Technology:** Scrum at Scale emphasizes technology that supports scaling, requiring a stack that can handle complex, large-scale projects while enhancing user interface and experience.
- **Culture:** Fosters a culture of transparency, inspection, and adaptation.
- **Processes and Lifecycle Phases:** Built around two cycles, Scrum Master cycle and Product Owner cycle, both emphasizing iterative processes and feedback loops.
- **Goals:** Ensures all teams have a shared vision and are aligned toward a common set of goals.

Spotify Model

- **Focus:** Agile methodology tailored for Spotify's unique needs
- **Methodologies Incorporated:** Scrum, Kanban, and other Agile practices at team discretion
- **Scale:** Tribes of up to 100 people
- **People:** Encourages fluid roles like Tribe Lead, Chapter, and Guild, allowing for more adaptive and context-specific teams.
- **Infrastructure:** The Spotify Model is flexible with respect to infrastructure, given its focus on autonomous squads.
- **Technology:** Spotify's engineering culture values autonomy and innovation, thus the technology choices are made to encourage quick iterations, excellent user experience, and robust scaling.
- **Culture:** Culture is highly valued, with an emphasis on autonomy, mastery, and purpose.
- **Processes and Lifecycle Phases:** Does not define explicit life cycle phases but focuses on Agile work methodology at a micro-level.
- **Goals:** Focuses on alignment and autonomy, ensuring that squads are not only empowered but also aligned towards common organizational goals.

Annex 2 – Agile survey

Section 1- User profiling

Question 1 – Free text

Company name:
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Question 2 – Multiple choice

Industry:	<ul style="list-style-type: none"><input type="radio"/> Technology<input type="radio"/> Telecommunications<input type="radio"/> Media<input type="radio"/> Energy<input type="radio"/> Utilities<input type="radio"/> Healthcare<input type="radio"/> Manufacturing<input type="radio"/> Education<input type="radio"/> Wholesale and Retail<input type="radio"/> Public Administration<input type="radio"/> Defense<input type="radio"/> Banking<input type="radio"/> Insurance<input type="radio"/> Accommodation and Food Service<input type="radio"/> Other...
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Question 3 – Multiple choice

Company size:	<ul style="list-style-type: none"><input type="radio"/> 0 – 50*<input type="radio"/> 51 – 100<input type="radio"/> 101 – 250<input type="radio"/> 251 – 500<input type="radio"/> 501 – 1000<input type="radio"/> 1001 – 5000<input type="radio"/> 5001 – 10000<input type="radio"/> 10000+
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*Exclusion criteria

Question 4 – Multiple choice

Function:	<ul style="list-style-type: none"><input type="radio"/> Information Technology<input type="radio"/> Operations<input type="radio"/> Sales and Marketing<input type="radio"/> Human Resources<input type="radio"/> Research and Development<input type="radio"/> Customer Service<input type="radio"/> Finance<input type="radio"/> Procurement<input type="radio"/> Legal<input type="radio"/> Other...
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Question 5 – Multiple choice

Role:	<ul style="list-style-type: none"><input type="radio"/> C-Level (e.g., CEO, CFO, CTO, CIO)<input type="radio"/> Vice President<input type="radio"/> Director<input type="radio"/> Senior Management<input type="radio"/> Middle Management<input type="radio"/> Team Leader/Project Manager<input type="radio"/> Staff Member<input type="radio"/> Other...
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Question 6 – Multiple choice

Years of Experience:	<ul style="list-style-type: none"><input type="radio"/> Less than 1 year<input type="radio"/> 1-3 years<input type="radio"/> 4-6 years<input type="radio"/> 7-9 years<input type="radio"/> 10-12 years<input type="radio"/> 13-15 years<input type="radio"/> More than 15 years
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Question 7 – Multiple choice

Role in Agile project or Agile transformation:	<ul style="list-style-type: none"><input type="radio"/> No directly involved*<input type="radio"/> Scrum Master / Kanban Lead<input type="radio"/> Agile Coach<input type="radio"/> Agile Product Owner<input type="radio"/> Sponsor of an Agile project<input type="radio"/> Agile Team Member<input type="radio"/> End User of the Service/Product<input type="radio"/> Senior Stakeholder<input type="radio"/> Other...
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*Exclusion criteria

Section 2- Agile adoption and organization

Question 8 – Multiple choice

Year of Adoption of the First Agile Project (Pilot):	<ul style="list-style-type: none"><input type="radio"/> I don't know<input type="radio"/> Before 2008<input type="radio"/> 2008 - 2010<input type="radio"/> 2011 – 2013<input type="radio"/> 2014 – 2016<input type="radio"/> 2017 – 2019<input type="radio"/> 2020 – 2022<input type="radio"/> 2023 – to present
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Question 9 – Multiple choice

Primary Area of Agile Adoption:	<ul style="list-style-type: none"><input type="radio"/> Software Development<input type="radio"/> Human Resources<input type="radio"/> Marketing<input type="radio"/> Sales<input type="radio"/> Customer Service<input type="radio"/> Operations<input type="radio"/> Other...
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Question 10 – Checkboxes

Establishment of Communities of Practices (knowledge sharing groups across different Agile teams):	<ul style="list-style-type: none"><input type="checkbox"/> No Community of Practices<input type="checkbox"/> Scrum Masters / Kanban Lead Community<input type="checkbox"/> Developers Community<input type="checkbox"/> Architects Community<input type="checkbox"/> Testing & QA Community<input type="checkbox"/> UX/UI Design Community<input type="checkbox"/> Other...
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Question 11 – Checkboxes

Level of Agile Adoption within the company:	<ul style="list-style-type: none"><input type="checkbox"/> Project Level (individual projects adopting Agile practices)<input type="checkbox"/> Program Level (multiple related projects adopting Agile practices)<input type="checkbox"/> Portfolio Level (organization-wide strategic adoption across all projects and programs)<input type="checkbox"/> Not applicable (no formal adoption beyond casual or isolated practices)
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Question 12 – Checkboxes

Agile Frameworks Adopted:	<ul style="list-style-type: none"><input type="checkbox"/> Scrum<input type="checkbox"/> Kanban<input type="checkbox"/> Lean<input type="checkbox"/> Scrumban<input type="checkbox"/> Scrum of Scrum<input type="checkbox"/> DaD (Disciplined Agile Delivery)<input type="checkbox"/> Nexus<input type="checkbox"/> SAFe (Scaled Agile Framework)<input type="checkbox"/> LeSS (Large Scale Scrum)<input type="checkbox"/> Other...
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Question 13 – Multiple choice

Collaboration Among Agile Teams:	<ul style="list-style-type: none"><input type="radio"/> No formal collaboration<input type="radio"/> Informal ad-hoc meetings<input type="radio"/> Regular scheduled meetings<input type="radio"/> Other...
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Section 3 – Agile performance

Question 14 – Multiple choice grid

How these indicators changed in the early stage of the Agile adoption compared to the initial state:

	Significantly decreased	Slightly decreased	No change	Slightly increased	Significantly increased
Team Productivity	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Customer Satisfaction	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Employee Satisfaction	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Delivery time	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Response to Change	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Quality of Deliverables	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Question 15 – Multiple choice grid

How these indicators changed after a stable Agile adoption compared to the initial state:

	Significantly decreased	Slightly decreased	No change	Slightly increased	Significantly increased
Team Productivity	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Customer Satisfaction	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Employee Satisfaction	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Delivery time	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Response to Change	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Quality of Deliverables	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Question 16 – Multiple choice grid

Deployment Frequency:

	Daily	Weekly	Bi-weekly	Monthly	Quarterly	Semiannual
Before Agile adoption	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
In the early stage of Agile adoption	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
After a stable Agile adoption	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Question 17 – Multiple choice grid

Percentage of Defects Detected (e.g., bugs, errors, misalignments calculated on the total functions released):

	5%	5-10%	11-20%	More than 20%
Before Agile adoption	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
In the early stage of Agile adoption	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
After a stable Agile adoption	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Section 4 – Agile Challenges

Question 18 – Multiple choice grid

Challenge 1 - Resistance to the introduction of Agile methodologies:

	Very low	Low	Medium	High	Very high
Established routines on Agile adoption	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Myths and misunderstandings on Agile adoption	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Over-enthusiasm for Agile methodologies	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Lack of executive support to Agile adoption	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Managerial reluctance on Agile adoption at the team level	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Question 19 – Multiple choice grid

Challenge 2 - Lack of Agile Knowledge

	Very low	Low	Medium	High	Very high
Training and coaching deficits in Agile adoption	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Inconsistent understanding of Agile concepts across teams	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Partial or inaccurate Agile adoption on transformation effectiveness	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Unclear managerial roles adaptation to Agile	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Question 20 – Multiple choice grid

Challenge 3 - Transition Turbulence

	Very low	Low	Medium	High	Very high
Sticking to waterfall practices during Agile adoption	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Not adjusting workloads for Agile transformation	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Running Agile and traditional methodologies	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Old bureaucratic practices and silos in Agile implementation	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Question 21 – Multiple choice grid

Challenge 4 - Multi-team Environments

	Very low	Low	Medium	High	Very high
Unstructured coordination between multiple Agile teams	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
High team autonomy conflicting with organizational objectives	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Scaling Agile across geographically distributed locations	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
HR reward structures unaligned with individual performance on Agile adoption	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Question 22 – Multiple choice grid

Challenge 5 - Requirement and Progress Management

	Very low	Low	Medium	High	Very high
Managing high-level requirements in large Agile projects	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Breaking down high-level requirements into detailed tasks for Agile teams	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Creating well-defined user stories for effort estimation within Agile development	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Agile's short development cycles, impacting other organizational functions' long lead times	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Regulatory processes on the collaborative nature of Agile methodology	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Question 23 – Open question

Considering your direct experience, have any important challenges been forgotten?
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Section 5 – Agile Success Factors

Question 24 – Multiple choice grid

Success Factor 1 - Leadership Support

	Very low	Low	Medium	High	Very high
Management's active support to Agile methodologies adoption	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Effective strategy mapping Agile methodologies to previous workflows	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Change leaders in effectively coordinating the Agile transformation process	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Unbiased change leaders to an objective and effective Agile transformation	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Well-defined Product Owner role to the success of Agile projects.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Question 25 – Multiple choice grid

Success Factor 2 - Training and Coaching

	Very low	Low	Medium	High	Very high
Agile training in preparing employees for Agile adoption	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Agile coaching to the improvement of Agile methodologies application	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Educating management on Agile practices to the effectiveness of Agile transformation	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Specialized training for Product Owners to the successful application of Agile	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Customizing Agile practices to meet the organization’s needs for successful adoption	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Question 26 – Multiple choice grid

Success Factor 3 - Clear and Smooth Transition

	Very low	Low	Medium	High	Very high
Making the change to Agile non-negotiable to the success of transformation	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Strong leadership commitment to sustaining Agile practices amid challenges	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Pilot implementations of Agile to build credibility and acceptance for broader adoption	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Simplifying practices and processes to supporting Agile implementation	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Question 27 – Multiple choice grid

Success Factor 4 - Team Engagement

	Very low	Low	Medium	High	Very high
Identifying and involving Agile advocates as a driving force for change	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Gaining buy-in from both business and technology departments to successful Agile transformation	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Allowing teams and squads to self-organize fostering ownership and commitment	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Supporting decentralized adoption of Agile practices to a successful transformation	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Question 28 – Multiple choice grid

Success Factor 5 -Culture and Communication

	Very low	Low	Medium	High	Very high
Well-sponsored and clear communication about Agile change across the organization	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Highlighting early successes to creating positive momentum for Agile transformation	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Forming Agile communities within the organization to embracing Agile transformation	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Effective organizational alignment in objectives and practices to supporting Agile transformation	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Question 29 – Open question

Considering your direct experience, have any important success factors been forgotten?
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Question 30 – Multiple choice

Would you be available for an exclusive interview (approximately 1h)?	<input type="radio"/> Yes* <input type="radio"/> No
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*Criteria used to identify the potential case study

Annex 3 – Survey heatmaps

Team Productivity	TMT	FS	EU	Industrial	Other
Significantly decreased	0%	5%	0%	0%	0%
Slightly decreased	16%	15%	0%	0%	13%
No change	9%	10%	17%	0%	13%
Slightly increased	53%	55%	58%	71%	44%
Significantly increased	21%	15%	25%	29%	31%

Customer Satisfaction	TMT	FS	EU	Industrial	Other
Significantly decreased	0%	5%	0%	0%	0%
Slightly decreased	5%	5%	0%	0%	6%
No change	35%	20%	25%	0%	19%
Slightly increased	56%	65%	67%	93%	69%
Significantly increased	5%	5%	8%	7%	6%

Employee Satisfaction	TMT	FS	EU	Industrial	Other
Significantly decreased	0%	0%	0%	0%	0%
Slightly decreased	16%	20%	8%	0%	13%
No change	23%	10%	17%	0%	13%
Slightly increased	58%	70%	67%	100%	75%
Significantly increased	2%	0%	8%	0%	0%

Delivery time	TMT	FS	EU	Industrial	Other
Significantly decreased	0%	5%	0%	0%	0%
Slightly decreased	0%	5%	0%	0%	13%
No change	5%	0%	25%	7%	6%
Slightly increased	70%	50%	25%	21%	38%
Significantly increased	26%	40%	50%	71%	44%

Response to Change	TMT	FS	EU	Industrial	Other
Significantly decreased	0%	5%	0%	0%	0%
Slightly decreased	0%	0%	0%	0%	6%
No change	2%	0%	0%	7%	6%
Slightly increased	56%	45%	33%	7%	25%
Significantly increased	42%	50%	67%	86%	63%

Quality of Deliverables	TMT	FS	EU	Industrial	Other
Significantly decreased	0%	0%	0%	0%	0%
Slightly decreased	2%	10%	0%	0%	0%
No change	16%	15%	8%	7%	6%
Slightly increased	47%	40%	33%	36%	31%
Significantly increased	35%	35%	58%	57%	63%

Figure 65 - Heatmap Agile performance by company sector - Early stage vs initial state

Team Productivity	TMT	FS	EU	Industrial	Other
Significantly decreased	0%	0%	0%	0%	0%
Slightly decreased	0%	5%	0%	0%	0%
No change	2%	0%	0%	0%	6%
Slightly increased	23%	25%	0%	7%	6%
Significantly increased	74%	70%	100%	93%	88%

Customer Satisfaction	TMT	FS	EU	Industrial	Other
Significantly decreased	0%	0%	0%	0%	0%
Slightly decreased	0%	5%	0%	0%	6%
No change	5%	0%	0%	0%	0%
Slightly increased	58%	35%	33%	14%	31%
Significantly increased	37%	60%	67%	86%	63%

Employee Satisfaction	TMT	FS	EU	Industrial	Other
Significantly decreased	0%	0%	0%	0%	0%
Slightly decreased	2%	5%	0%	0%	6%
No change	7%	0%	0%	0%	6%
Slightly increased	63%	50%	33%	43%	44%
Significantly increased	28%	45%	67%	57%	44%

Delivery time	TMT	FS	EU	Industrial	Other
Significantly decreased	0%	0%	0%	0%	0%
Slightly decreased	0%	5%	0%	0%	6%
No change	2%	0%	8%	0%	0%
Slightly increased	16%	15%	0%	14%	13%
Significantly increased	81%	80%	92%	86%	81%

Response to Change	TMT	FS	EU	Industrial	Other
Significantly decreased	0%	0%	0%	0%	0%
Slightly decreased	0%	5%	0%	0%	6%
No change	5%	0%	0%	0%	6%
Slightly increased	5%	5%	8%	7%	6%
Significantly increased	91%	90%	92%	93%	81%

Quality of Deliverables	TMT	FS	EU	Industrial	Other
Significantly decreased	0%	0%	0%	0%	0%
Slightly decreased	2%	5%	0%	0%	0%
No change	7%	0%	0%	0%	6%
Slightly increased	12%	20%	8%	7%	6%
Significantly increased	79%	75%	92%	93%	88%

Figure 66 - Heatmap Agile performance by company sector - Stable adoption vs initial state

Team Productivity	251 – 500	501 – 1000	1001 – 5000	5001 – 10000	10000+
Significantly decreased	0%	0%	0%	10%	0%
Slightly decreased	0%	0%	8%	0%	15%
No change	33%	0%	8%	0%	11%
Slightly increased	67%	100%	54%	80%	49%
Significantly increased	0%	0%	31%	10%	26%

Customer Satisfaction	251 – 500	501 – 1000	1001 – 5000	5001 – 10000	10000+
Significantly decreased	0%	0%	0%	10%	0%
Slightly decreased	0%	0%	0%	0%	5%
No change	33%	20%	23%	0%	27%
Slightly increased	67%	80%	69%	90%	61%
Significantly increased	0%	0%	8%	0%	7%

Employee Satisfaction	251 – 500	501 – 1000	1001 – 5000	5001 – 10000	10000+
Significantly decreased	0%	0%	0%	0%	0%
Slightly decreased	0%	0%	8%	10%	16%
No change	33%	40%	8%	10%	15%
Slightly increased	67%	60%	77%	80%	68%
Significantly increased	0%	0%	8%	0%	1%

Delivery time	251 – 500	501 – 1000	1001 – 5000	5001 – 10000	10000+
Significantly decreased	0%	0%	0%	10%	0%
Slightly decreased	0%	0%	0%	0%	4%
No change	0%	20%	0%	10%	7%
Slightly increased	67%	80%	54%	30%	49%
Significantly increased	33%	0%	46%	50%	41%

Response to Change	251 – 500	501 – 1000	1001 – 5000	5001 – 10000	10000+
Significantly decreased	0%	0%	0%	10%	0%
Slightly decreased	0%	0%	0%	0%	1%
No change	0%	20%	0%	0%	3%
Slightly increased	33%	60%	38%	30%	41%
Significantly increased	67%	20%	62%	60%	55%

Quality of Deliverables	251 – 500	501 – 1000	1001 – 5000	5001 – 10000	10000+
Significantly decreased	0%	0%	0%	0%	0%
Slightly decreased	0%	20%	0%	10%	1%
No change	0%	40%	15%	0%	12%
Slightly increased	33%	20%	38%	30%	43%
Significantly increased	67%	20%	46%	60%	43%

Figure 67 - Heatmap Agile performance by company dimension - Early stage vs initial state

Team Productivity	251 – 500	501 – 1000	1001 – 5000	5001 – 10000	10000+
Significantly decreased	0%	0%	0%	0%	0%
Slightly decreased	0%	0%	0%	10%	0%
No change	0%	0%	0%	0%	3%
Slightly increased	0%	60%	15%	0%	16%
Significantly increased	100%	40%	85%	90%	81%

Customer Satisfaction	251 – 500	501 – 1000	1001 – 5000	5001 – 10000	10000+
Significantly decreased	0%	0%	0%	0%	0%
Slightly decreased	0%	0%	0%	10%	1%
No change	0%	0%	0%	0%	3%
Slightly increased	33%	100%	38%	20%	41%
Significantly increased	67%	0%	62%	70%	55%

Employee Satisfaction	251 – 500	501 – 1000	1001 – 5000	5001 – 10000	10000+
Significantly decreased	0%	0%	0%	0%	0%
Slightly decreased	0%	0%	0%	10%	3%
No change	0%	20%	0%	10%	3%
Slightly increased	33%	80%	46%	20%	55%
Significantly increased	67%	0%	54%	60%	39%

Delivery time	251 – 500	501 – 1000	1001 – 5000	5001 – 10000	10000+
Significantly decreased	0%	0%	0%	0%	0%
Slightly decreased	0%	0%	0%	10%	1%
No change	0%	0%	0%	0%	3%
Slightly increased	0%	80%	0%	10%	12%
Significantly increased	100%	20%	100%	80%	84%

Response to Change	251 – 500	501 – 1000	1001 – 5000	5001 – 10000	10000+
Significantly decreased	0%	0%	0%	0%	0%
Slightly decreased	0%	0%	0%	10%	1%
No change	0%	0%	0%	10%	3%
Slightly increased	0%	60%	0%	0%	4%
Significantly increased	100%	40%	100%	80%	92%

Quality of Deliverables	251 – 500	501 – 1000	1001 – 5000	5001 – 10000	10000+
Significantly decreased	0%	0%	0%	0%	0%
Slightly decreased	0%	0%	0%	10%	1%
No change	0%	20%	0%	0%	4%
Slightly increased	0%	40%	8%	0%	12%
Significantly increased	100%	40%	92%	90%	82%

Figure 68 - Heatmap Agile performance by company dimension - Stable adoption vs initial state

Myths and misunderstandings on Agile adoption	TMT	FS	EU	Industrial	Other
Very low	12%	15%	25%	36%	19%
Low	51%	65%	50%	57%	63%
Medium	26%	15%	17%	7%	13%
High	5%	5%	0%	0%	0%
Very high	7%	0%	8%	0%	6%

Established routines on Agile adoption	TMT	FS	EU	Industrial	Other
Very low	2%	0%	0%	0%	0%
Low	2%	0%	8%	0%	6%
Medium	14%	30%	17%	7%	13%
High	63%	55%	58%	71%	69%
Very high	19%	15%	17%	21%	13%

Lack of executive support to Agile adoption	TMT	FS	EU	Industrial	Other
Very low	2%	0%	0%	0%	0%
Low	5%	10%	0%	7%	6%
Medium	2%	15%	8%	7%	6%
High	79%	70%	67%	64%	69%
Very high	12%	5%	25%	21%	19%

Managerial reluctance on Agile adoption at the team level	TMT	FS	EU	Industrial	Other
Very low	5%	0%	0%	0%	0%
Low	5%	5%	8%	7%	6%
Medium	12%	5%	0%	14%	13%
High	60%	70%	75%	50%	56%
Very high	19%	20%	17%	29%	25%

Over-enthusiasm for Agile methodologies	TMT	FS	EU	Industrial	Other
Very low	19%	25%	25%	29%	25%
Low	47%	60%	50%	64%	69%
Medium	28%	15%	25%	7%	6%
High	5%	0%	0%	0%	0%
Very high	2%	0%	0%	0%	0%

Figure 69 - Heatmap Agile performance by company sector - Resistance to Agile introduction

Inconsistent understanding of Agile concepts across teams	TMT	FS	EU	Industrial	Other
Very low	0%	0%	0%	0%	0%
Low	2%	0%	17%	7%	0%
Medium	12%	10%	0%	0%	6%
High	42%	45%	33%	21%	19%
Very high	44%	45%	50%	71%	75%

Unclear managerial roles adaptation to Agile	TMT	FS	EU	Industrial	Other
Very low	0%	0%	0%	0%	0%
Low	2%	0%	8%	0%	0%
Medium	5%	15%	8%	14%	6%
High	65%	55%	50%	43%	56%
Very high	28%	30%	33%	43%	38%

Training and coaching deficits in Agile adoption	TMT	FS	EU	Industrial	Other
Very low	2%	0%	0%	0%	0%
Low	0%	0%	0%	0%	0%
Medium	5%	10%	8%	0%	25%
High	65%	60%	83%	86%	69%
Very high	28%	30%	8%	14%	6%

Partial or inaccurate Agile adoption on transformation effectiveness	TMT	FS	EU	Industrial	Other
Very low	0%	0%	0%	0%	0%
Low	2%	0%	17%	14%	0%
Medium	9%	10%	0%	0%	0%
High	37%	25%	25%	14%	44%
Very high	51%	65%	58%	71%	56%

Figure 70 - Heatmap Agile performance by company sector - Lack of Agile Knowledge

Sticking to waterfall practices during Agile adoption	TMT	FS	EU	Industrial	Other
Very low	0%	0%	0%	0%	0%
Low	7%	0%	8%	7%	0%
Medium	7%	10%	8%	7%	19%
High	12%	10%	0%	0%	0%
Very high	74%	80%	83%	86%	81%

Not adjusting workloads for Agile transformation	TMT	FS	EU	Industrial	Other
Very low	0%	0%	0%	0%	0%
Low	5%	0%	0%	0%	0%
Medium	14%	20%	25%	14%	19%
High	63%	45%	25%	14%	25%
Very high	19%	35%	50%	71%	56%

Running Agile and traditional methodologies	TMT	FS	EU	Industrial	Other
Very low	2%	0%	0%	0%	0%
Low	2%	0%	8%	0%	0%
Medium	16%	15%	0%	7%	25%
High	44%	25%	33%	36%	13%
Very high	35%	60%	58%	57%	63%

Old bureaucratic practices and silos in Agile implementation	TMT	FS	EU	Industrial	Other
Very low	0%	0%	0%	0%	0%
Low	5%	0%	8%	7%	0%
Medium	5%	10%	0%	7%	6%
High	7%	5%	0%	0%	6%
Very high	84%	85%	92%	86%	88%

Figure 71 - Heatmap Agile performance by company sector - Transition Turbulence

Unstructured coordination between multiple Agile teams	TMT	FS	EU	Industrial	Other
Very low	0%	0%	0%	0%	0%
Low	2%	5%	0%	7%	0%
Medium	37%	40%	25%	50%	25%
High	53%	40%	75%	36%	63%
Very high	7%	15%	0%	7%	13%

High team autonomy conflicting with organizational objectives	TMT	FS	EU	Industrial	Other
Very low	0%	0%	0%	0%	6%
Low	12%	10%	17%	50%	44%
Medium	67%	75%	67%	43%	38%
High	19%	15%	17%	7%	6%
Very high	2%	0%	0%	0%	6%

HR reward structures unaligned with individual performance on Agile adoption	TMT	FS	EU	Industrial	Other
Very low	14%	5%	0%	0%	19%
Low	35%	70%	67%	86%	63%
Medium	35%	20%	33%	0%	6%
High	12%	5%	0%	14%	6%
Very high	5%	0%	0%	0%	6%

Scaling Agile across geographically distributed locations	TMT	FS	EU	Industrial	Other
Very low	2%	0%	0%	0%	6%
Low	12%	5%	0%	7%	6%
Medium	51%	50%	75%	79%	69%
High	26%	45%	25%	14%	13%
Very high	9%	0%	0%	0%	6%

Figure 72 - Heatmap Agile performance by company sector - Multi-team Environments

Managing high-level requirements in large Agile projects	TMT	FS	EU	Industrial	Other
Very low	2%	0%	0%	0%	0%
Low	7%	0%	8%	7%	6%
Medium	12%	15%	0%	0%	0%
High	67%	85%	75%	64%	75%
Very high	12%	0%	17%	29%	19%

Creating well-defined user stories for effort estimation within Agile development	TMT	FS	EU	Industrial	Other
Very low	0	0	0	0	0
Low	0	0	0	0	0
Medium	0	0	0	0	0
High	1	1	1	1	1
Very high	0	0	0	0	0

Agile's short development cycles, impacting other organizational functions' long lead times	TMT	FS	EU	Industrial	Other
Very low	2%	0%	8%	0%	0%
Low	5%	5%	8%	7%	0%
Medium	7%	10%	0%	7%	13%
High	26%	10%	25%	7%	25%
Very high	60%	75%	58%	79%	63%

Breaking down high-level requirements into detailed tasks for Agile teams	TMT	FS	EU	Industrial	Other
Very low	0	0	0	0	0
Low	7%	5%	17%	7%	13%
Medium	9%	10%	0%	7%	0%
High	67%	75%	67%	50%	69%
Very high	16%	10%	17%	36%	19%

Regulatory processes on the collaborative nature of Agile methodology	TMT	FS	EU	Industrial	Other
Very low	2%	0%	0%	0%	0%
Low	7%	5%	8%	21%	6%
Medium	40%	30%	33%	29%	31%
High	51%	65%	42%	50%	56%
Very high	0%	0%	17%	0%	6%

Figure 73 - Heatmap Agile performance by company sector - Requirement and Progress Mgmt.

Annex 4 – Case study interviews

Question 1 - How would you assess the overall effectiveness of the Agile transformation in improving responsiveness and adaptability within your area of responsibility?

Persona	Answer
Director	The Agile transformation improved overall responsiveness, particularly in B2B, where structured client interactions and team stability supported effective adaptation. However, in B2C, high volatility and constantly shifting market demands continue to challenge full adaptability, limiting consistent gains in those areas.
PM	Agile practices have noticeably accelerated delivery capabilities and improved responsiveness at the sprint and team level. That said, the benefits are uneven across units: teams with high stability respond quickly, while those exposed to frequent priority shifts struggle to maintain consistent adaptability.
RTE	The transformation drove significant improvements in responsiveness wherever team composition and stakeholder roles remained stable. In contrast, teams with fluctuating structures or unclear upstream dependencies found it harder to realize the benefits of agility, leading to inconsistent responsiveness.

Question 2 - What differences in Agile adoption and maturity have you observed between B2B and B2C teams?

Persona	Answer
Director	B2B teams display greater maturity and predictability in applying Agile practices. In contrast, B2C teams struggle with inconsistent adoption due to shifting priorities, reactive behaviors, and frequent stakeholder changes.
PM	B2B teams maintain better rhythm and backlog discipline, which supports stable delivery. B2C teams, however, often face disruptions due to last-minute market changes, resulting in less predictable planning and outcomes.
RTE	B2B trains show consistent throughput and cadence, reflecting higher Agile maturity. B2C trains are often disrupted by shifting external expectations, leading to fragmented adoption and less effective Agile execution.

Question 3 - How has the transformation impacted time-to-market performance, and what factors contribute to current improvements or delays?

Persona	Answer
Director	Time-to-market improved significantly in B2B thanks to stable team setups and direct client collaboration. In B2C, systemic delays still occur due to external volatility and coordination issues across dependent teams.
PM	The time needed to bring features to market has decreased across most units, especially B2B. In B2C, however, reactive reprioritizations and late requirement changes continue to delay delivery despite Agile mechanisms.
RTE	Time-to-market improvements were strongest where trains had stable team configurations and aligned priorities. Delays persist in B2C where mid-sprint changes and ambiguous ownership frequently disrupt delivery plans.

Question 4 - How would you describe the evolution of backlog clarity and feature prioritization across different units?

Persona	Answer
Director	Backlog clarity has generally improved, particularly in B2B where stakeholder inputs are more structured. However, in B2C, the speed of requirement changes often erodes prioritization discipline.
PM	There has been a clear improvement in backlog refinement, but in B2C the backlog often needs to be reworked due to conflicting business inputs. B2B units show more stable and forward-looking prioritization.
RTE	Overall refinement practices have improved, with clearer prioritization in B2B trains. In B2C trains, fast-moving market demands often force last-minute reprioritizations that destabilize the backlog.

Question 5 - In what ways have quality metrics, such as defects per release and product quality index (PQI), been influenced by Agile practices?

Persona	Answer
Director	Quality has improved notably in B2B units, with reduced defects and rising PQI scores. In B2C, quality is still sensitive to volatile inputs and unstable team configurations.
PM	Defects have decreased overall, particularly when teams are stable. However, in B2C, maintaining consistent quality remains a challenge due to frequent changes and unclear requirements.
RTE	Defects per release dropped in stable trains. Rework and instability in B2C trains keep PQI levels below those observed in more predictable B2B settings.

Question 6 - How has team collaboration evolved, and what challenges still persist in maintaining stable, high-performing Agile teams?

Persona	Answer
Director	Collaboration improved wherever stable teams were maintained. B2C team turnover and stakeholder changes still erode team cohesion and performance continuity.
PM	Teams collaborate more effectively now, particularly in B2B. Challenges persist around cross-team dependencies and external alignment in B2C settings.
RTE	Team-level collaboration works well in stable trains. However, when stakeholders or team members change frequently, alignment and shared ownership degrade quickly.

Question 7 - What patterns have you noticed regarding sprint velocity trends, and how do these differ between B2B and B2C contexts?

Persona	Answer
Director	Sprint velocity in B2B has shown sustainable growth. In B2C, velocity remains inconsistent due to external pressures and frequent changes in scope.
PM	Velocity has increased across most teams, but B2C teams experience frequent drops when external disruptions force backlog changes mid-sprint.
RTE	Velocity in B2B trains has stabilized at a high level. B2C trains still face interruptions that break sprint rhythm and affect throughput.

Question 8 - How effective have SAFe ceremonies and program-level rituals been in ensuring consistent delivery and early risk detection?

Persona	Answer
Director	SAFe ceremonies introduced a common structure, but execution quality varies. Some units use them effectively; others treat them as routine and miss risk signals.
PM	The ceremonies helped define roles and expectations, but in several teams, participation and focus are inconsistent, limiting their impact on risk mitigation.
RTE	SAFe events created valuable alignment points, especially in stable trains. In less mature or volatile units, their effectiveness is reduced due to lack of discipline or stakeholder continuity.

Question 9 - How would you evaluate the balance between short-term sprint objectives and long-term strategic alignment after the Agile transformation?

Persona	Answer
Director	Shorter iterations made operations more transparent, but aligning sprint outputs with long-term goals remains difficult in dynamic contexts like B2C.
PM	Sprint goals are generally met, but strategy alignment varies. B2C often lacks continuity in vision due to reactive changes in direction.
RTE	Sprints are effective tactically, but without stable portfolio input and stakeholder continuity, strategic alignment across multiple trains is inconsistent.

Question 10 - Based on your experience, what are the critical lessons learned that should guide future improvements in scaling Agile practices across heterogeneous environments?

Persona	Answer
Director	Agile must be adapted to local conditions. A single model cannot account for the variability between B2B and B2C business contexts.
PM	Flexibility in implementation is essential. Agile needs to be tailored to business reality and team structure rather than imposed as a fixed standard.
RTE	The success of scaling depends on matching practices to structural realities. Stabilizing teams and stakeholders should come before enforcing uniform frameworks.

Annex 5 – Transformation councils RACI matrix

Activity	Executive Sponsor	Product Owner	Scrum Master	Agile Coach	HR Lead	Department Heads	Agile Champions	Governance Coach
Define transformation vision and OKRs	A	R	-	C	-	-	-	-
Validate training and team readiness	-	-	R	A	C	-	-	-
Assess delivery performance and friction points	-	A	R	C	-	-	-	-
Ensure consistency of Agile adoption	-	-	-	A	C	R	-	-
Evaluate domain-level scalability	-	-	-	C	-	-	R	-
Review institutionalization of agility	A	-	-	C	-	-	-	R

Table 18 - Transformation councils RACI for Scrum

Activity	Portfolio Mgmt.	Epic Owners	Enterprise Architects	RTE	System Architects	HR Lead	Finance	Product Mgmt.
Define transformation vision and OKRs	A	R	C	-	-	-	-	-
Validate training and team readiness	-	-	-	A	C	C	C	-
Assess delivery performance and friction points	-	-	-	R	-	-	-	A
Ensure consistency of Agile adoption	-	-	-	-	-	C	-	-
Evaluate domain-level scalability	-	-	-	-	-	-	-	-
Review institutionalization of agility	C	-	-	-	-	-	-	-

Table 19 - Transformation councils RACI for SAFe