# THESIS

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# Agile IT Service Management: An Analysis and Enhancement of ITIL Practices in Corporate Environments

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# Acronyms

| | |
|---|---|
| AI | Artificial Intelligence |
| API | Application Programming Interface |
| CI/CD | Continuous Integration/Continuous Delivery |
| DevOps | Development Operations |
| EIC | International Electrotechnical Commission |
| ISO | International Organization for Standardization |
| ITIL | Information Technology Infrastructure Library |
| ITSM | Information Technology Service Management |
| KM | Knowledge Management |
| ML | Machine Learning |
| PO | Product Owner |
| SR | Service Request |

# 1 Introduction

The changing demands of the digital age have resulted in a paradigm change in IT service management known as ITSM. In order to achieve greater responsiveness, efficiency, and customer satisfaction in corporate settings, this shift underlines the significance of integrating Agile approaches with Information Technology Infrastructure Library principles. The increasing need for IT services that are not only accurate and reliable but also flexible enough to adjust to the swiftly developing technical environment and the demands of business clients highlights the importance of this topic to be studied in more detail.

Introducing Agile concepts into ITIL processes is an effective approach to achieve both strategic agility and operational excellence as businesses work to better align their IT operations with business goals. It is important to mention that this is not a new concept, but implementing new technologies and methods to have the advantages of both Agile and ITIL service management principles has been a significant challenge for companies, so it is an interesting topic to do research identifying gaps in existing practices and finding both feasible and resilient solutions. Examining possible synergies between Agile approaches and ITIL procedures within the context of ITSM is the aim of this work. Although the study intends to investigate the advantages and difficulties of this integration, it consciously leaves out the analysis of other IT service management frameworks that are not covered by ITIL or Agile principles.

The work, which is divided into five chapters, begins with an overview of the key concepts of ITSM, ITIL, and Agile approaches. This is followed by a detailed analysis of the methodologies used. The results of qualitative interviews with IT experts, an analysis of a collection of literature, and a synthesis of conceptual and practical understanding of the implementation of Agile ITIL principles in business environments are presented in the chapters that follow. A review of the main findings and their implications for further study and IT service management practice is provided in the Conclusion chapter.

This research utilizes a technique that blends a methodical assessment of available literature with qualitative interviews to comprehensively capture the theoretical foundations of the topic and the real-world experiences of IT service management experts. This mixed-methods approach makes it easier to comprehend how Agile and ITIL practices interact and how they affect business settings' IT service delivery.

The author completed undergraduate studies in Computer Science Engineering and Information and Communications Technologies at Bachelor's level, and furthered his education in the Business Informatics Master's program at Corvinus University of Budapest. Additionally, he took part in a Double Degree Program with Católica Porto Business School studying Management with Business Analytics specialization. The choice to concentrate on Agile in IT Service Management is motivated by the author's passion for software development and IT management along with the interesting potential of Agile and ITIL frameworks to considerably enhance service quality, efficiency, and alignment with business objectives. This area of research reflects the author's professional goals to learn and improve IT service management methodologies.

Special thanks go to Dr. Zoltán Szabó Thesis Supervisor, for his valuable advice and support during the research. Appreciation is also given to the IT experts who took part in the interviews, offering important perspectives that enhanced the comprehension of Agile ITIL practices in business environments.

# 2 Key concepts

## 2.1 ITSM

IT Service Management is a framework within Information Technology, which provides users and professionals a comprehensive service of tasks and procedures intended to design, develop, implement, and maintain IT services (Red Hat 2023). These services could be offered both internally and externally in an organization. It also includes more than basic IT support and assistance as ITSM teams can manage from simple office equipment to complex assets like servers or data centers.

The workflow includes receiving and processing requests from clients and users, however, these are not the end of the procedure. It contains thorough, continuous systems that prioritize and respond to these requests according to predetermined standards and processes, guaranteeing effectiveness and uniformity in the delivery of services. The scope of ITSM includes proactive management of all technology around the business, not just reactive assistance. This covers both the equipment that end users can see and use daily and also the key back-end infrastructure, such as servers, networks, and even the software programs that help the businesses to operate. Usually, organizations want to improve the responsiveness, efficiency, and alignment of their IT service delivery with business goals by streamlining it with ITSM. By ensuring that IT services are valuable and not just simply functional, these strategies can improve user satisfaction and organizational performance (Atlassian 2023).

Building on the fundamental ideas of ITSM, it is important to acknowledge that it serves as one of the backbones for today's IT operations, making it easier for IT services to be aligned with business goals and service targets. The organized method of delivering IT services used by ITSM guarantees not only the effectiveness and dependability of IT services but also their ongoing development. This implies a controlled integration of people, technology, and processes with the goal of increasing customer happiness and service value optimization. Organizations may establish a more proactive, service-oriented IT culture that supports business growth and transformation by using ITSM to establish a careful balance between outstanding operational performance and innovative approaches.

## 2.2 ITIL

### 2.2.1 Introduction

ITIL is a widely recognized framework for managing IT services while providing best practices for organizations all around the world. To support consistency and ongoing development among companies utilizing IT-enabled services, it attempts to offer full support for setting up and maintaining an IT service management system. Leading the way in the world of IT service management, ITIL provides common terminology and recommendations that are in line with international standards, enabling efficient cross-domain cooperation. This strategy guarantees that IT services add value to the company by increasing efficiency and effectiveness. By building on service providers' intentions and ensuring that they are in line with company objectives and customer expectations, ITIL assists businesses in getting the most out of IT and digital services.

Since its founding in the 1980s, ITIL has seen many iterations. Released between 2000 and 2004, ITIL V2 concentrated on a series of ten books describing processes like Availability Management, Service Desk, Incident Management, and Security Management. Introduced in 2007 and updated in 2011, ITIL v3 had six core publications that cover and organize every stage of the service lifecycle. This version had four organizational roles and 26 processes that were in line with the ISO/IEC 20000 Service Management standards. (itSMF UK and Axelos 2020)

Launched in 2019, the most recent version ITIL 4 combines traditional methods with modern ideas like digital transformation, value streams, customer experience, Lean, Agile, and DevOps. It embraces new methods to work while preserving integrity with existing practices. By pushing service management to a strategic position inside businesses and emphasizing value delivery by an adaptable, efficient, and integrated system, ITIL 4 encourages holistic strategies for organizations.

### 2.2.2 ITIL v4

ITIL 4 is a key framework in the development of ITSM, representing a paradigm change from conventional process-centric techniques to a more customer-focused and flexible approach. Since its initial introduction in the 1980s, ITIL has experienced multiple modifications. The latest iteration, ITIL 4 integrates the combined knowledge and practices of traditional IT and new practices of service management. ITIL 4, in contrast to its predecessors, offers a flexible, adaptable model that consists of 34 different management practices, allowing it to go beyond the strict boundaries of predetermined processes. These procedures offer thorough direction on

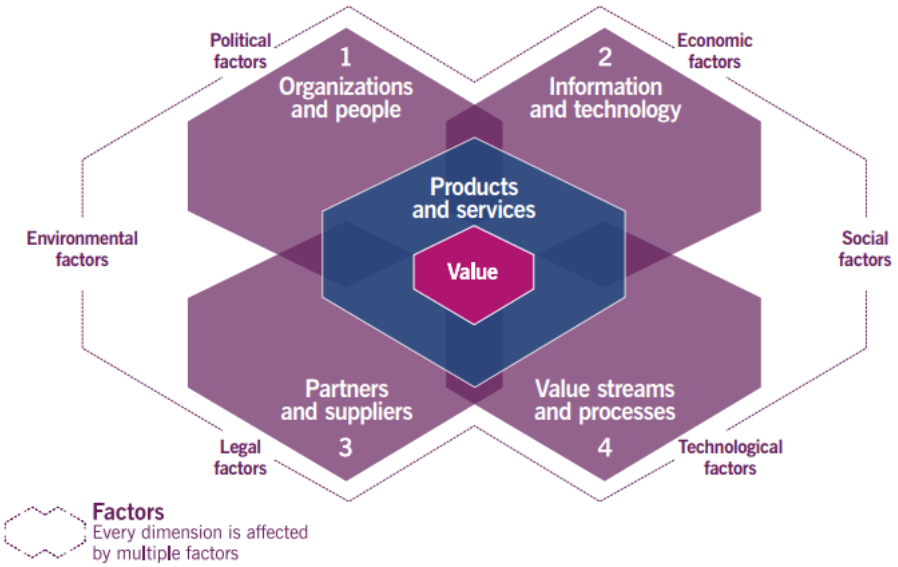
a range of service management topics, such as risk management, customer experience, organizational change, and architecture. By incorporating modern approaches like Agile, Lean, and DevOps, ITIL has evolved to better support a service management environment that is more value-driven and responsive to changing market conditions.

The Four Dimensions Model in ITIL V4 provides complete guidelines for service management, ensuring businesses handle all essential components of service delivery by developing broad and efficient approaches. The model was built upon ITIL 3's 4Ps which included People, Process, Platforms, and Partners. This model in ITIL's newest version includes four interconnected dimensions, each dedicated to a specific aspect of service management, collectively providing effective and successful service delivery. The dimensions and connected factors can be seen in **Figure 1**.

The *Organizations and People* component highlights the significance of maintaining the proper structure, culture, and competences inside the organization. That emphasizes the importance of having skilled individuals with appropriate tools and an enabling environment that encourages teamwork and continued progress. This component focuses on ensuring that the workforce is capable and committed to adjusting to new challenges and changes in the service management environment. The second dimension, *Information and Technology*, emphasizes the technological and informational components of service delivery. This area contains the essential infrastructure, applications, and methods for handling information, guaranteeing that technology functions act as a catalyst for providing services that align with user requirements and company goals.

The third component, *Partners and Suppliers*, addresses the vital function of external relationships to deliver outstanding products. An organization's capacity to provide excellent services is often dependent on external partners and suppliers. Efficiently managing these relationships is vital for flawless service integration and collaborative value creation. The fourth dimension called *Value Streams and Processes* focuses on the processes and value streams that support service delivery. It promotes the creation and supervision of streamlined and successful procedures that are in line with the organization's objectives, guaranteeing that services are provided through improved, well-designed workflows.

**Figure 1**
The four Dimensions Model and factors (itSMF UK and Axelos 2020)




It is also noteworthy how ITIL 4 and DevOps work together to resolve the long-standing conflict between the structured, stability-focused ITIL framework and the fast-paced, iterative nature of DevOps. Instead of positioning itself as a competitor of DevOps methods, ITIL 4 aims to align with the mindset of those methods by supporting a cooperative, iterative, and customer-focused approach to service enhancement and delivery. The focus placed by ITIL 4 on the Service Value System and Service Value Chain (which support an ongoing flow of value creation through integrated and flexible procedures) indicates this alignment (Axelos 2022). Embracing DevOps principles creates an environment where stability and agility exist together allowing for rapid innovation without compromising service integrity, reliability, and availability. This integration represents a major turning point in the ITSM space by providing businesses with a broad, adaptable framework for managing and delivering IT services in a changing external environment.

### 2.2.3 Guiding Principles in ITIL 4

From strategic decision-making to day-to-day operations, the ITIL guiding principles provide a universal and scalable set of guidelines that help companies overcome most of the scenarios they might need to deal with. In order to provide a framework for continuous advancement at all levels, these principles are made to be flexible and adaptive to overcome any challenges in objectives, strategies, working styles, or organizational structures. These principles include focusing on value, starting where the company currently stands, progressing iteratively, promoting visibility, working holistically, keeping solutions practical, and automating where it

is possible (itSMF UK and Axelos 2020). Each principle, which can be observed in **Figure 2**, focuses on a different side of service management and encourages businesses to provide value effectively and efficiently while adjusting to the rapidly changing business landscape.

The ITIL guiding principles place a strong emphasis on value, stating that every organizational action should either directly or indirectly add to the value of the business for its stakeholders, customers, and workforce. This includes being aware of the requirements and perspectives of consumers and making sure that the offerings support the desired results while minimizing risks and expenses. In similar terms, the 'starting where you are' principle prevents ignoring existing advantages in the effort to make progress faster and easier. To ensure that any improvements build on what currently exists rather than starting from scratch, it encourages discovering and utilizing present capabilities. This method prevents wasting time and resources while maintaining important components that might improve the service.

The step-by-step approach, inclusive participation, and a holistic perspective of service management are emphasized by the concepts of thinking and working holistically, cooperating actively, increasing visibility, and developing iteratively with feedback. Iterative development enables regulated and controlled adjustments, while cooperation and transparency guarantee that every relevant stakeholder is informed and involved, promoting an inclusive and transparent culture. This ensures that all components of the company are aligned and utilized while contributing to value delivery by adopting a holistic approach (itSMF UK and Axelos 2020). Finally, focusing on efficiency and effectiveness while optimizing and using automated solutions will keep processes simple and feasible. This can also lead to simpler solutions and to the optimal utilization of technologies to increase capacities and cut down on wasting time and money. Together these principles provide businesses with a strong foundation for delivering and enhancing IT services that are in line with their strategic goals (itSMF UK and Axelos 2020).

**Figure 2**
ITIL guiding principles (itSMF UK and Axelos 2020)


## 2.3 Connection between ITIL and ITSM

Understanding the differences between ITSM and ITIL is essential to comprehend the entirety of operations in IT services. Despite their apparent interchangeability, these terms have distinct meanings within service management. The comparison based on scope, approach, certifications, and implementation can be seen in **Table 1**. ITIL is a collection of best practices and standards designed to enhance and synchronize IT service management. It offers a thorough explanation of several activities, procedures, checklists, and processes that may be customized to meet the requirements of any type of business (itSMF UK and Axelos 2020). It has a strong emphasis on cost-effectiveness through resource optimization and reducing loss while it concentrates on matching IT services to business objectives. However, ITSM is a more comprehensive term that describes the actual provision and administration of high-quality IT services that satisfy the demands of the enterprise (Atlassian 2024b). It includes a larger variety of tasks, such as project management connected especially to IT projects, and general technology resource management, which aims to improve the service quality for every customer.

ITIL offers a tactical framework and particular procedures needed to successfully apply ITSM's strategy and approach to managing IT services inside a business. ITSM is essentially concerned with the "what" regarding service management, which includes defining the services, overseeing their quality, and making sure they add value to the company (Red Hat 2023). On the other hand, ITIL focuses on the "how," offering best practices and a methodology to guarantee the successful and efficient implementation of the strategies. Obtaining ITIL certification may be an important move for professionals in the field who want to improve their skills and comprehend this topic. It shows a dedication to implementing industry-recognized best practices and gives them an in-depth understanding of how to enhance IT service management. Because of this, experts with ITIL certification are frequently seen as crucial resources in companies for optimizing an organization's IT operations, resource efficiency, and general service quality (Atlassian 2024b).

**Table 1**
Comparison between ITSM and ITIL (TheKnowledgeAcademy 2023)

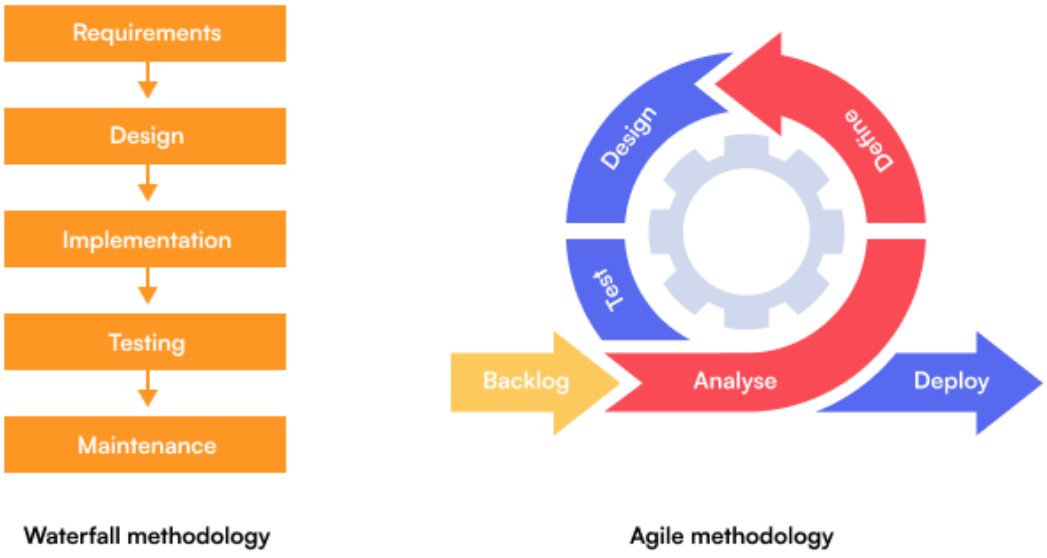
| Key differences | ITSM | ITIL |
|---|---|---|
| **Scope and focus** | Broad: encompasses all IT service management principles | A specific framework for IT service management |
| **Approach** | Flexible: it allows organizations to adopt and adapt practices as needed | Prescriptive: provides detailed best practices and guidelines |
| **Certification** | Multiple certification options | Has its own set of certifications |
| **Implementation process** | Customizable based on the organization’s requirements | Follows a defined and structured implementation process |

## 2.4 Agile

### 2.4.1 Introduction

By dividing the project lifecycle into iterative stages, Agile methodology is an innovative approach to project and service management that promotes continuous collaboration, adaptation, and improvement. Unlike the sequential structure of the conventional "waterfall" management process, Agile encourages cross-functional team collaboration in a dynamic and flexible setting as shown in **Figure 3**. Agile is mostly about continuous project progress and short feedback loops, not about tightly defined methods or processes (Testsigma 2024). This approach is based on the Agile Manifesto, which emphasizes people and interactions over procedures and tools, practical solutions over extensive documentation, customer participation over contract negotiation, and reacting to change rather than following a predetermined plan (Beck et al. 2001). Agile is therefore more than simply a process: it's a mindset that encourages teams to be flexible, embrace change, and constantly seek ways to improve their output and performance.

**Figure 3**
Waterfall and Agile methodology (Testsigma 2024)



This approach emphasizes the importance of being adaptable and responsive, enabling teams to successfully handle the complexities and uncertainties that come from diverse projects. As Agile promotes an iterative development process it allows a more flexible and adaptable approach to project planning and execution. This flexibility guarantees that project goals are not only achieved but also in accordance with the evolving customer requirements and market conditions. Agile fosters a culture of continuous improvement, allowing teams to refine their strategies, processes, and outputs in real-time by using insights obtained from each iteration (Chahal 2023). It emphasizes collaboration not only within the project team but also with stakeholders and clients, promoting a comprehensive and inclusive approach to project development. Furthermore, it is more than simply a methodology as it is an innovative framework that empowers teams to achieve unique advantages and positive outcomes by being collaborative, flexible, and customer-centric (Chahal 2023). To summarise, it allows teams to adapt and learn from the project landscape as it progresses.

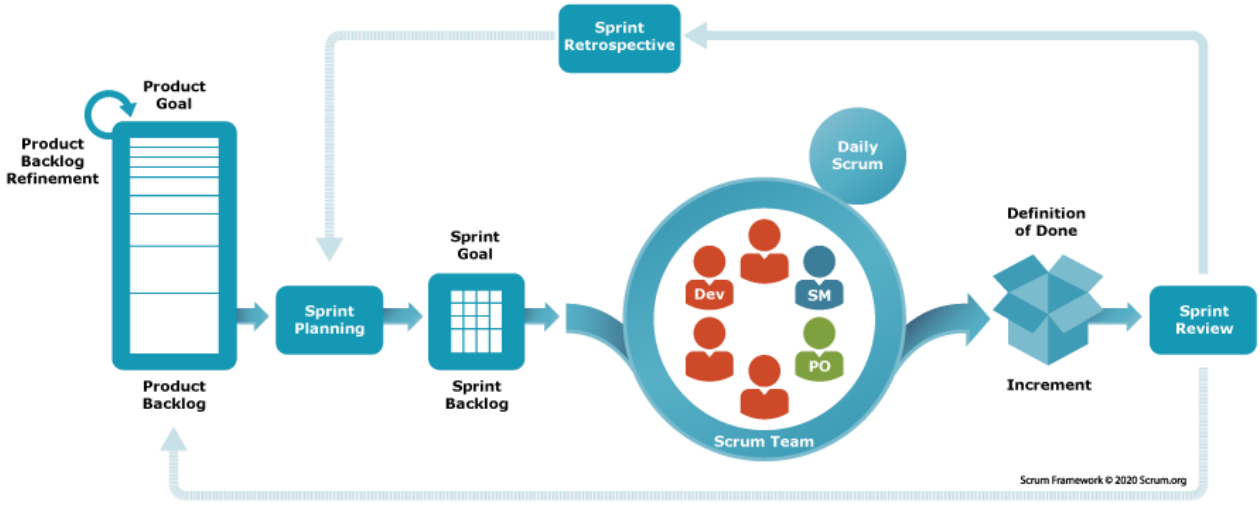
### 2.4.2 Frameworks

Under the Agile approach, several frameworks were created including Scrum, Kanban, and Lean which are used daily by companies worldwide. These approaches maintain the fundamental values of Agile including flexibility and improvement from iteration to iteration. Today, these methods focus more on creating the optimal combination of available practices that are effective for the teams' and projects' needs instead of following strict rules and deadlines (Greer and Hamon 2011). Nowadays, teams try out different Agile practices and technologies before deciding which one to adopt. Agile approaches are relevant and successful in a constantly changing environment because of this continuous improvement and adaptation concept, which gives teams the tools and mindset they need to respond quickly and effectively to changes in the market and consumer demands (Atlassian 2022).

Scrum is an agile framework that helps teams work together more effectively on challenging tasks. It organizes development into work cycles known as sprints, with the goal of delivering a product increment at the completion of each sprint. The three pillars of the Scrum framework—transparency, inspection, and adaptation—allow for ongoing development and flexibility in an environment of change (Scrum.org n.d.). As can be seen in **Figure 4**, the Scrum Master, Product Owner, and Developer roles inside the Scrum team establish a collaborative and clearly defined work environment that ensures the team functions as a cohesive one towards shared objectives. Scrum's iterative structure makes it flexible to adapt to changes, which makes

it very useful in situations where needs change frequently and unexpectedly (Schwaber and Sutherland 2020).

**Figure 4**
Workflow in Scrum Framework (Scrum.org n.d.)

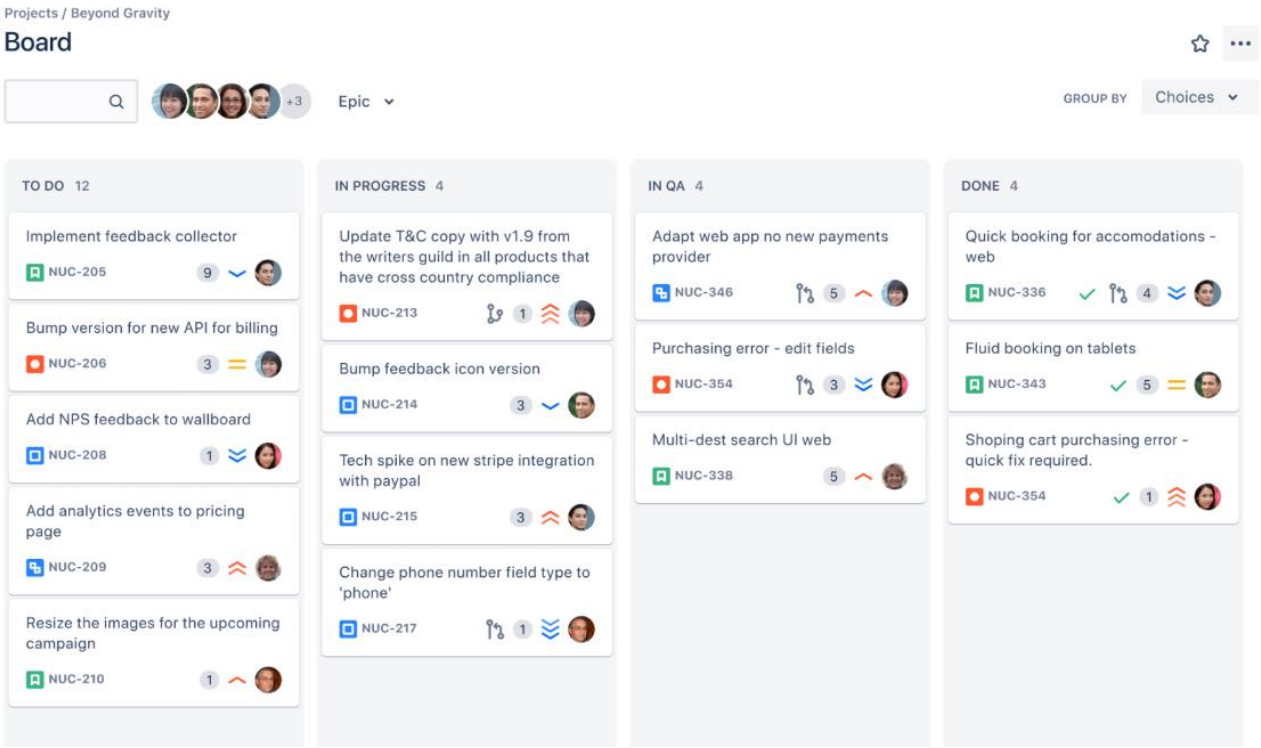



A visual management technique called Kanban helps teams work more efficiently by communicating to them how the work is progressing through several stages. Kanban, which has its roots in the Japanese manufacturing industry, has been modified to focus on workflow visualization, the restriction of work-in-progress items, and flow management in work and project management. This method helps teams find bottlenecks and optimize procedures for increased productivity and higher-quality output (Anderson 2010). It also encourages a constant workflow and ongoing improvement. As Kanban offers a continuous flow of work without the rigid timeboxes of Scrum, it is a flexible tool that may be used by teams trying to improve their delivery process (Anderson 2010).

According to Anderson, Kanban is an evolutionary approach to project management that strikes a balance between flexibility and structure and encourages productivity, efficiency, and constant advancement. Kanban helps teams to produce high-quality work more consistently by prioritizing tasks, limiting work-in-progress, and visualizing workflow. Because of its flexibility and emphasis on creating value, this approach works especially well in the fast-paced environment of technology companies, where more conventional project management techniques might not be as successful. One of the most known Kanban tools is the Kanban

board, where all team members can check the current tasks waiting for competition, the status of the task, and the name of the team member who is responsible for completing it (Atlassian 2024d). A sample board of a software developer team can be seen in **Figure 5** below.

**Figure 5**
Kanban Board (Atlassian 2024d)




Derived from the Toyota Production System, Lean methodology aims to maximize customer value while eliminating waste. Organizations are encouraged to decrease inefficiencies, optimize their operations, and make ongoing improvements by applying Lean thinking (Womack and Jones 1996). Lean strives to improve customer happiness and corporate performance by reducing costs, increasing quality, and shortening manufacturing times by identifying and eliminating non-value-adding operations. This methodology's guiding concepts help companies achieve operational excellence, including processes for defining value, mapping the value stream, creating flow, establishing pull, and reaching sufficient operations (Womack and Jones 1996).

### 2.4.3 Effects

The adoption of agile techniques has brought a significant disruption in the field of product management, changing methods towards development, team dynamics, and interaction with customers. The paper "Agile Methodologies for Improved Product Management" (Chahal

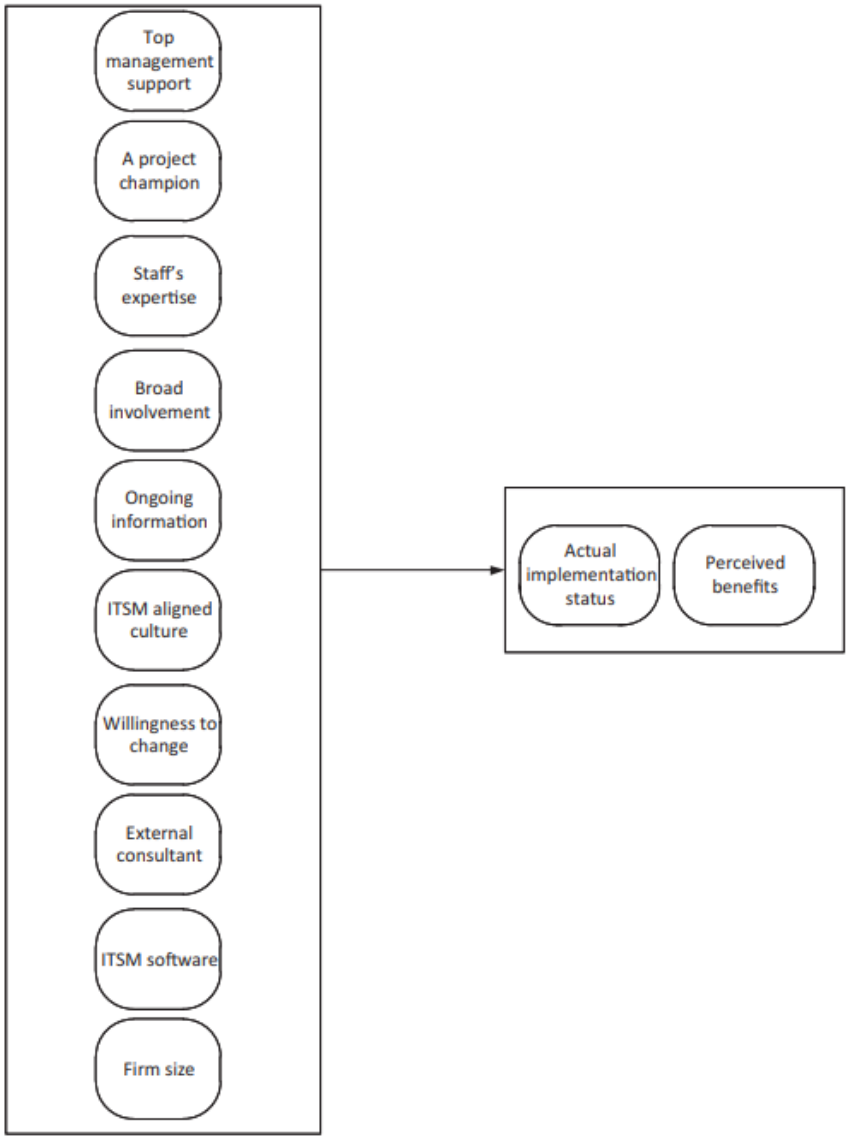
2023) offers a thorough examination of this change, examining the complex effects as well as the advantages of implementing Agile approaches in business operations. It clarifies that Agile approaches, which prioritize iterative development, cross-functional teams, and constant attention on customer value, are more than just a collection of procedures. These approaches rather represent a way of thinking that underlies an organization's operational and cultural foundation (Chahal 2023). This shift makes it easier to build products that are more flexible and responsive, enabling quick adjustments to meet changing consumer demands and market conditions. The research also emphasizes how important it is to overcome fundamental hurdles like unwillingness to change and a need for cultural alignment. Furthermore, it offers guidance on how to implement these through leadership development, education, and continuous learning. Organizations that embrace Agile not only enhance their product management procedures but also set out on an innovative path that fosters innovation, increases delivery, and improves customer satisfaction, all of which are crucial for gaining a competitive edge and succeeding financially in today's market atmosphere.

## 2.5 Challenges

Organizations have many obstacles while implementing ITIL, which they must overcome in order to successfully reach operational development. One of the main challenges can be identified in the technical nature of the implementation process (Müller and de Lichtenberg 2018). Organizations frequently encounter challenges when it comes to comprehending and implementing the wide range of complicated practices and procedures specified in ITIL. The complex dynamics of this situation might result in misunderstandings and incorrect implementation of methods, potentially leading to poorer performance and restricted achievement of benefits. The priori model (**Figure 6**) presented in the paper "Implementing IT Service Management: A systematic literature review" identifies ten factors that could have a significant impact on the success of an ITIL implementation including ITSM software, staff expertise, broad involvement, ongoing information, top management support, ITSM-aligned culture, willingness to change, and company size. This paper emphasizes that the adoption of ITIL also demands an immense culture shift inside the company, with a focus on the ongoing enhancement of services and bringing together IT services with the requirements of the business (Iden and Eikebrokk 2013). The implementation of ITIL sometimes faces opposition from employees who are used to traditional work practices, highlighting the crucial role of change management in ensuring effective adoption.

Another notable issue is the demand for internal and external resources to apply ITIL practices. Both financial and human resources are essential for the implementation of ITIL techniques, which need training, process redesign, and investment in new tools. Especially smaller firms may find the allocation of resources to be overwhelming, resulting in the adoption of only a portion of ITIL procedures, which might weaken the holistic strategy that ITIL promotes (Iden and Eikebrokk 2013). Furthermore, the absence of solid and definite evidence about the immediate advantages and financial gains derived from implementing ITIL might pose challenges for firms in fully dedicating themselves to its adoption and ensuring its long-term viability. Therefore, further research is required to offer enterprises a more specific and rational plan for implementing ITIL (Iden and Eikebrokk 2013).

**Figure 6**
The a priori success model for ITIL implementation (Iden and Eikebrokk 2013)




Mora et al. (2022) have recognized a major challenge, which is the weak conceptual development of agile IT Service Management. Although agility has been extensively studied and applied in the field of Software Engineering, its use in ITSM is still in its early stages and is mostly based on ideas related to the software. The lack of progress in this area highlights the urgent need for a well-defined and sophisticated understanding of Agility that is particularly designed for the ITSM field. In the absence of a distinct and commonly accepted understanding of the concept of Agility in ITSM, companies and professionals may have difficulties in taking full advantage of all the positive effects of agile techniques, which might result in incomplete or inconsistent implementations (Mora et al. 2022).

Moreover, the combination of distinct components within different ITSM frameworks poses a major challenge. According to Mora et al. (2022), many frameworks and standards do not fit naturally into either the agile or conventional categories but instead demonstrate a combination of both paradigms. The combination of different elements might result in confusion and challenges when it comes to classifying and implementing them. Organizations may struggle to adapt these blended frameworks to their unique operational requirements and cultural contexts. Furthermore, the absence of a commonly agreed conceptualization and comprehension of agile ITSM intensifies this problem, since it results in diverse interpretations and implementations of Agility among different businesses and frameworks. The complexity that results from this has an impact on both the theoretical advancement of Agile ITSM and the practical obstacles faced by businesses aiming to implement and acquire positive benefits from Agile methods (Mora et al. 2022).

In practice, the combination of Agile methodologies and ITIL service management represents a change in perspective from considering software development as just another industrial process to seeing it as a component of a wider value stream. In the past, teams had to comply with specific rules prescribed by ITIL, which concentrated on discrete processes. Nevertheless, ITIL 4 shifts this emphasis to an end-to-end value stream methodology, highlighting the need for proactive issue identification, accident management, and monitoring. This change calls for an environment of effective interaction, supported by operational tools made for detecting concerns that might negatively impact customers. However, the difficulty is in maintaining service providers accountable for their efficient service monitoring, as product developers often put business functionalities ahead of operational tools that help to maintain service stability such as regular logging, performance monitoring, and knowledge base building.

# 3 Methodology

## 3.1 Research objectives

The main aim of the work is to analyze how Agile principles are and can be part of traditional IT service management practices and frameworks. This includes identifying the challenges and benefits coming from implementing Agile ITIL practices in corporate settings. One of the main objectives is to propose recommendations to enhance existing service management systems to incorporate Agile and ITIL principles for improved, more efficient, and flexible service delivery, while also identifying potential challenges of implementing those recommendations.

During the research, the following two questions are tried to be answered and addressed:

a) *How agile methodologies could complement and enhance traditional ITIL practices when it comes to IT service management in business settings?*
   This includes exploring the ways these two can be combined while investigating both theoretical and practical elements of doing so.
b) *What technologies that are categorized as Agile can be used in existing systems to ensure continuous improvement and shorter request resolution times?*
   This includes discovering gaps and weaknesses in current workflows in corporate settings while exploring what stops companies from integrating these practices into their systems.

## 3.2 Methods

This work employs a mixed-methods approach, combining a thorough analysis of collecting existing literature with qualitative interviews, to fulfill the research objectives and provide answers to the issues addressed above. With the use of this approach, it is possible to thoroughly examine how Agile methodologies can complement and reinforce ITIL principles in the context of IT service management in business settings. Additionally, the possible impediments and challenges are also identified, categorized, and explained in this work. Additionally, some of the technologies that can promote faster service delivery times and continuous improvements are also identified and discussed.

To acquire and assess the available research on the integration of Agile techniques with ITIL practices in IT service management, the first part of the work consists of a systematic evaluation

of the existing literature on the topic. In addition to discussing the difficulties, and advantages observed in corporate settings, the review concentrates on identifying the theoretical foundations and real-world implementations of integrating Agile and ITIL concepts. To guarantee an accurate understanding of the subject, this study incorporates reports from the sector and academic publications, in the Introduction and also the Results section.

Interviews with experts directly related to IT service management are another major part of the thesis. Two support engineers and one product owner who have extensive experience working in corporate contexts with real-life customers are represented through interviews. These individuals were chosen because they have first-hand knowledge of the problems, processes, and opportunities for development in IT service management procedures, so the opinions of experts in the corporate fields can also be considered.

## 3.3 Data collection

Two support engineers and one product owner, who have years of experience in applying IT service management frameworks in a corporate setting, took part in semi-structured interviews to gather primary data. The purpose of the interviews was to get practical insights into the challenges, benefits, and implementation of Agile ITIL practices. A set of fifteen questions were asked to the support engineers in order to get an insight into their firsthand experiences with Agile workflows and technologies. In the meantime, the product owner was asked 20 questions that centered on managerial and strategic viewpoints on incorporating Agile principles and ITIL frameworks. An in-depth knowledge of the operational and strategic components of implementing Agile ITIL was made possible by this dual-focused study, which also contributed to a detailed examination of how Agile principles might improve conventional IT service management techniques.

## 3.4 Interviews

### 3.4.1 Support Engineer

In the support engineer interviews, key areas of focus include the implementation of Agile principles in processes, stakeholder engagement and communication, knowledge management and culture, ensuring the adaptability of processes, and tools and collaboration. With an emphasis on the benefits of efficient communication, knowledge management, and the use of automation and collaboration technologies to accelerate support procedures, these interviews

seek to discover feasible suggestions for combining Agile techniques with ITIL principles in the sector. The focus areas can be observed in more detail in **Table 2**.

**Table 2**
Support Engineer Interview Focus Areas

| Aspect | Focus areas |
|---|---|
| **Agile Principles in Processes** | Discuss how Agile approaches are used for support procedures, evaluate how effective they are, and explore areas where improvement could be achieved in incident and request management. |
| **Stakeholder Engagement and Communication** | Potential and previously used techniques for integrating Agile and ITIL in the support domain while including stakeholders and maintaining open lines of communication. |
| **Knowledge Management and Culture** | The role of knowledge management in the integration of Agile and ITIL. It involves identifying important systems and shifts in company cultures that are necessary for making support processes more effective and less time-consuming. |
| **Ensuring Adaptability in Processes** | Discussing how Agile approaches can improve the adaptability and speed of traditionally ITIL-based support systems. |
| **Tools and Collaboration** | The utilization of collaboration and automation solutions to streamline support procedures and evaluate the efficacy of data logs in troubleshooting. |

### 3.4.2 Product Owner

The interview questions for the Product Owner colleague concentrate on strategic integration and framework understanding, stakeholder engagement and communication, balancing flexibility and standardization, operational and developmental integration, and resource allocation with different tools. The purpose of these questions is to examine the strategic viewpoint of integrating Agile techniques and ITIL practices into IT service management, highlighting challenges and potential solutions for doing so in order to enhance the speed as

well as the quality of service delivered. The focus areas of the interview can be observed in more detail in **Table 3**.

**Table 3**
Product Owner Interview Focus Areas

| Aspect | Focus areas |
|---|---|
| **Strategic Integration and Framework Understanding** | Examining the strategic incorporation of Agile approaches with ITIL, identify barriers, and discuss situations when integration enhanced service delivery speed or quality. |
| **Stakeholder Engagement and Communication** | Discussing how to engage stakeholders and ways to inform them of the advantages of using ITIL and Agile. Consider if teams and stakeholders have a clear vision of how the product creates value. |
| **Balancing Flexibility and Standardization** | Talking about ways of how to achieve a balance between the end-to-end value stream and individual processes, while having Agile flexibility in operations and ITIL standardization in mind. |
| **Operational and Developmental Integration** | Reviewing organizational structures that are in line with ITIL and Agile for efficient product delivery and the importance of shared services/APIs to innovate in value creation. |
| **Tools, Data-Driven Decision Making, and Resource Allocation** | Tools that minimize service interruptions and interoperability issues while improving backlog transparency. Selecting people for roles effectively and matching them with their skills and expertise. |

# 4 Results

## 4.1 Findings from Interviews with Support Engineers

### 4.1.1 Background

Two interviews were conducted at this stage of the research, with IT service management professionals working for different multinational companies in Budapest, Hungary. The support engineers who have many years of experience were interviewed and asked about their daily work routines, experiences, and possible needs. During this phase, they identified weaknesses in corporate processes, while also indicated suggestions for improving current workflows. The interviews followed a semi-structured format as some questions were prepared beforehand while others emerged during the interview based on responses to the questions or topics discussed.

### 4.1.2 Agile Communication and Collaboration

Support engineering has been already affected by the introduction of agile methods that foster rapid communication and collaboration going beyond previous limitations. These techniques also serve to enhance team responsiveness and problem-solving capabilities within the teams themselves, an aspect brought up by talking to them.

Among the discoveries made during these conversations was the heavy reliance on real-time communication platforms such as Jira, Slack, or Microsoft Teams. Such tools have played a critical part in enabling instant communication not only among colleagues but also with partners or clients involved in any given project. In one case, it was noted that MS Teams is used for speeding up processes and giving effective assistance since they allow teams to interact instantly, here immediacy means not just faster but also better solutions communicated back to customers.

Cross-team communication is key to agility in support engineering: workers should be able to collaborate seamlessly across different departments including design or development thanks to agile methods adoption which brings with it relevant tools as well as skills needed for successful teamwork between various units within a company. One respondent put it best when he said “The collaboration loop enables us to exchange valuable internal insights invisible to customers thus enhancing our ability address complex issues more efficiently”.

Agile approaches excel at dealing with rapid change which is highly valued within support engineering thanks to its volatile nature caused by the constant evolution of technologies they are dealing with. Therefore, interviewees highlighted the importance of working iteratively, for example doing things incrementally over short periods called sprints, this way there can be constant feedback between different project phases leading to continuous improvement even after the initial solution has been delivered. In such a manner support engineers are always ready for new problems so that client needs are met with the most up-to-date fixes possible.

The interviews indicated that in today's support engineering profession, agility demands communication and collaboration strategies rooted in the principles of agile development. Support teams need real-time communication tools if they are going to keep pace with changes brought by rapidly evolving technology while fostering cross-functional collaboration across organizations. Through the adoption of these methods not only does response time improve but also customer experience becomes smoother, therefore, setting a higher bar for technical assistance.

### 4.1.3 Knowledge Management Strategies and Challenges

In the dynamic field of support engineering, managing information effectively is essential not only in resolving problems quickly but also in establishing a culture of continuous learning and improvement. The interviews were useful for understanding how knowledge management systems are implemented and what challenges as well as opportunities they bring to support engineers.

A recurring pattern that appeared during the interviews is the importance of creating a culture that places a significant value on and actively encourages the exchange of information. Engineers extensively utilized systems and software platforms such as Confluence to document solutions and exchange insights within the team. "After resolving each problem, we are encouraged and sometimes even required to generate knowledge base articles. It is aimed at acquiring knowledge from every experience," an engineer noted during the interviews. This technique not only facilitates the resolution of similar challenges in the future but also enhances the collective expertise of the team, making it a fundamental aspect of the support engineering process.

Alongside its evident benefits, engineers also pointed out some significant issues regarding knowledge management, particularly concerning how effectively the existing solutions work.

One engineer stated that poor search engines used in knowledge bases as the biggest problem saying “The difficulty of finding relevant cases due to bad search engines opens up room for improvement.” Lack of efficient searching capability coupled with disorganized repositories slows down issue resolution by failing to provide quick access to already handled cases together with associated data.

There is much potential for making KM systems user-friendlier and easier to use. One proposal involves integrating AI-powered search engines that can understand context and show more accurate results. Furthermore, better organization as well as standardized templates for documentation may improve visibility into these systems.

Effective knowledge management is considered a great tool to help agile approaches in support engineering. Having easily accessible repositories of solutions and skills enables engineers to respond fast and efficiently to meet customer needs thus aligning with the rapid continuous delivery aspect of the agile philosophy. Secondly, a strong KM system greatly increases the continual learning process underpinned by agile methods leading to a circle of growth through innovation.

What has been gathered from these discussions underscores just how vital KM is towards enhancing effectiveness as well as responsiveness among support engineering teams. While there are still challenges notably around extracting knowledge, this represents significant opportunities for using such findings in improving support procedures. Overcoming these hurdles and bridging the gap between agile methods and existing knowledge repositories could allow for better service delivery at different levels while adapting to the ever-changing technology landscape.

### 4.1.4 Integrating Artificial Intelligence

Support engineering is being transformed by Artificial Intelligence through the provision of advanced applications that automate repetitive processes, increase diagnostic capabilities, and improve service delivery efficiency and accuracy. The answers given by the support engineers show that pilot AI programs have already had a greatly positive impact on their operations.

Through automation of monotonous and repetitive tasks, AI can significantly affect support engineering. These solutions can allow engineers to concentrate more on complex issues that require critical thinking and longer planning. An engineer noted that in one of the pilot programs at their company, AI now handles the initial sorting and prioritization of incoming support

requests. This ability ensures immediate response time to critical problems thus leading to faster resolution time which increases customer satisfaction rates. AI does these jobs continuously and parallel so the human workforce is not occupied with these smaller tasks anymore enabling teams to optimize their work around areas where human brainpower is required the most.

However, AI is not only used to automate processes, it can also enhance diagnosis procedures within support functions. Engineers have access to tools that can process large amounts of data very quickly revealing hidden patterns and abnormal behaviors. Another respondent said this about his organization's operation "The precision level for our diagnostics has gone up since we started to experiment with AI in our systems". One person explained how AI can work in the future by saying "These models can learn from past data and predict potential system failure points, even raising alarms before such would occur".

Integrating artificial intelligence into support engineering does come with some challenges despite its clear benefits. According to both interviewees, there must be constant training provided to support staff to cope with adaptability as frequent changes are being experienced in the world of AI technology. "Every new adoption has got its own learning curve," one interviewee said this while he also referred to different AI tools they had come across and had to learn how to use them well as part of pilot programs. Another issue can lie in reliability doubts raised towards the answers and conclusions made by AI systems as sometimes engineers can lack full understanding about how such decisions were reached by these models. A respondent discussed that it could be difficult to trust suggestions given by an AI if you cannot see what logic basis was used in making those judgments, so it is also important to test these systems' reliability before using them in production environments.

AI is also changing the way support engineers can interact with customers. Chatbots powered by artificial intelligence are being developed and tested to handle common inquiries thereby freeing up human experts for more technical and complex questions. However, care should be taken when using AI during customer engagements so that a high level of service is maintained at all times. "Although it is capable of doing basic tasks, there still needs a human control when dealing with more complex and difficult issues," remarked one interviewee who felt like productivity should not compromise the personalized attention for their customers.

### 4.1.5 Emerging Trends and Outlook

Support engineering is a rapidly evolving field, driven by technological advancements and changing market demands. Conversations with support engineers shed light on their views about current developments as well as future prospects in the industry.

One change that has been noted is the shift towards predictive problem-solving. Engineers imagine a world where automation and AI not just respond to problems but predict them before they occur and affect customers. “Think of a scenario where a system with artificial intelligence can foresee a service disruption before it happens, we would then be able to take preventive measures. That is the way to move forward,” explained one engineer. Adopting this proactive approach could transform support from being reactive into becoming a predictive function that could significantly enhance user experience and system reliability.

The utilization of AI and machine learning is expected to become increasingly significant in the field of support engineering. As these technologies advance, their incorporation into support systems is anticipated to strengthen, resulting in improved diagnoses accuracy of difficult cases and faster reaction times. "We have just started to explore the full potential of machine learning in predictive maintenance and support," another engineer stated, emphasizing the transformative impact these technologies may have on the delivery of support services. One area of increasing relevance within support engineering is artificial intelligence combined together with machine learning. It is expected that as these technologies mature, they will find more extensive use within support systems thereby enabling faster response times through accurate diagnosis of complex problems. “We are still scratching the surface when it comes to predictive maintenance and support using ML,” another engineer said while emphasizing the transformative capabilities that these tools might bring into service delivery.

Engineers have increasingly focused on improving customer experiences by leveraging technology for streamlining and enhancing support interactions. “Our goal is to speed up our response times through personalization with the help of automation. We intend for customers to feel like there’s someone who personally knows them all along their journey,” added another engineer. This trend reflects growing recognition that technical efficiencies must be balanced with service approaches that prioritize people’s needs and requests.

Efforts are still being made to improve the quality of service offered to clients and this has remained a top priority. This is done through the use of technology by engineers who work

towards simplifying support systems while at the same time making them better than before. Another goal that is anticipated in the near future is to improve response times while making them more personalized. Ensuring that customers feel comfortable and well taken care of during their journey was also brought up by one engineer. Such a trend shows that there is an increasing recognition that people-centered approaches need to be combined with operational excellence based on the understanding that it's not enough just to be efficient technically speaking but also to meet individual needs through service delivery methods.

Engineers are aware of the problems that could arise when new technologies are implemented in current systems. They must address the issues with compatibility, data security, and even user acceptance. There is always a mismatch between what technology can do and what it is allowed to do, particularly in industries that are heavily regulated, as one respondent noted. Bridging that gap is among the biggest challenges right now based on the interview responses. As technology continues advancing rapidly, so does the need for ongoing training and skills development. Support engineers will be required to keep pace with changes in their work driven by new tools and approaches. Continuous learning has become part of their job descriptions, one engineer said that keeping up with tech was essential for both personal growth and career advancement.

Support engineering's future relies on technological progress, specifically artificial intelligence and machine learning, according to those interviewed. These innovations could streamline support services' effectiveness and efficiency while also introducing potential pitfalls if not properly managed. Engineers expressed confidence in being able to shape tomorrow's trends based on this area alone but warned it would take more than just knowing how these technologies work with clients' needs. Customers should play key roles as service management practices continue to evolve around them. Instead of making things harder for end users, companies should use these technologies to enhance their experiences but not complicate their lives by pushing them to use many different systems.

### 4.1.6 Summary

The conducted interviews provided key insights into how support engineering is changing in a world that is deeply connected. The use of artificial intelligence has brought significant changes in the strategy of support engineering towards proactive problem-solving and streamlined customer support. The following four main categories were identified after analyzing the interview transcripts:

**1. The utilization of Agile methodologies and effective communication strategies**

Agile approaches, when implemented within support engineering teams, can enable them to quickly respond to evolving client needs as well as technical problems. Engineers emphasized the use of immediate communication and collaboration-enhancing technologies (such as Microsoft Teams and Jira) among other stakeholders, team members, and customers. This therefore implies that decisions should be made fast through real-time communication tools which also solve problems faster than before showing a shift from traditional top-down communication patterns. Additionally, knowledge management platforms were also identified as useful tools for sharing existing solutions among engineers thereby making redundant problem-solving tasks less likely.

**2. The connection between knowledge management and culture**

Knowledge management systems play an important role in supporting engineering by helping organizations collect, store, and share technical solutions. To avoid repeating issues engineers highlighted the importance of creating knowledge base articles which quickens the issue resolution process not only reducing the time taken but also increasing support team's knowledge bases. Moreover, these teams are highly committed to continuous learning and growth which creates an environment where people regularly develop themselves professionally while exchanging information among each other. This commitment can greatly assist firms in adapting to rapidly changing client requirements.

**3. Integration of Artificial Intelligence**

Artificial intelligence may be used within service engineering as an innovative way of improving the quality of services offered there. Repetitive tasks can be automated through AI which can also predict future problems based on the analysis of previous data besides providing an on-demand, real-time diagnosis. This also enables designers to deal with more complex or unique challenges hence increasing satisfaction and overall efficiency.

**4. Challenges and Outlook**

Engineers face challenges in keeping up with the pace at which technology changes and meeting customer expectations despite these technological advancements. The nature of the encountered problems has become more complicated demanding higher levels of technical competence as well as problem-solving skills. Additionally, the implementation of AI-

supported processes may require substantial adjustment from both engineers and their clients.

Support engineers are looking forward to working more with artificial intelligence and machine learning technologies to predict and prevent severe and complicated issues. This approach could revolutionize customer service entirely by moving from reactive problem-solving strategies into proactive ones aimed at averting them beforehand. In addition, there is a general agreement that advanced knowledge management systems need to be put in place while maintaining a strong focus on Agile approaches for organizations to deal effectively with potential future challenges.

## 4.2 Interview with Product Owner

### 4.2.1 Introduction

The last interview was conducted with a product owner who has years of experience in working with Agile methodologies within IT service management frameworks and software development teams. He shared his thoughts about running IT service management tasks and how they should be strategically implemented. The format of the interview was semi-structured which means that some questions were prepared in advance while others emerged during the conversation. This approach allowed to get a better understanding of what his day-to-day tasks look like as well as his views on Agile's growing role in improving service delivery and management practices alongside ITIL.

### 4.2.2 Integration of Agile and ITIL in IT Service Management

The combination of Agile methodologies with ITIL practices in IT service management is a key intersection within today's IT environment. This synthesis seeks to utilize the best elements of each framework for increased efficiency and agility in operations. Agile methodologies are flexible and adaptable, while it is also important to be process-oriented as required by ITIL. This part examines what it means to blend these two methods based on the interview with a product owner who has worked in both of these areas at different companies throughout his career. Agile approaches are valued largely because they follow an iterative process and can handle change through regular feedback loops. They enable quick adjustments to respond to user needs and evolving project requirements. On the other hand, ITIL offers a set of best practices designed around aligning IT services with business needs through the systematic management of the provided services.

The PO was in favour of integrating Agile into traditional service management processes arguing that this would make them more responsive to change given their typically inflexible nature. He explained that applying Agile principles could decrease resolution times for incidents as well as promote more adaptive service strategies considering dynamic operational environments. Furthermore, the interviewee said he lacked direct exposure to ITIL for a long time in his career, suggesting his biasedness coming from his background of working and knowing more about Agile. Therefore he implied that some parts of service delivery covered by ITIL might be revitalized by Agile but caution should be taken when blending these two frameworks so as not to disrupt the existing structures or compromise the integrity of managing services within an IT organization.

One major challenge that can be discussed during an integration between Agile and ITIL is the conflicting requirements caused by the flexibility of Agile against the rigidity brought by ITIL. However, the product owner proposed utilizing Kanban-based approaches within ITIL frameworks as a way to work with the support tickets so teams could be able to operate at an optimal level without compromising the quality of service management. Kanban's visual task management system may assist IT teams in prioritizing incidents and problems based on their severity and impact, which aligns with the service level management's continuous delivery aspect highlighted under ITIL.

Furthermore, the product owner envisioned that such integration could reduce the problem resolution cycle time and make resource allocation more dynamic in line with changing demands after integration is done. What this means is that if adopted, it could help make the IT service management process more flexible by building on more Agile tools so teams would not just wait until incidents actually happen but rather be prepared for them even before they take place. This could create a proactive approach instead of a reactive environment.

In summary, integrating Agile methodologies into IT service management based on ITIL practices has the potential to greatly improve adaptability and efficiency within IT organization's systems. However, there should be a balance between flexibility associated with Agile methods and the structured nature presented by ITIL guidelines. Without plans to solve these conflicts that may arise can lead the team to fail meeting the predefined goals during the integration process itself. All in all, it is crucial to find a balance between agility and previously working but outdated procedures.

### 4.2.3 Challenges of Iterative Thinking

The transition to an iterative and sprint-based approach in IT service management, particularly within an ITIL-guided framework, presents various challenges that require careful navigation. This part of the research is based on the insights from the interview with a product owner who has substantial experience with Agile methodologies and limited interaction with ITIL practices. The discussion sheds light on the difficulties encountered when attempting to implement Agile's iterative thinking within the traditionally linear and process-driven ITIL framework.

Project management under agile methodologies thrives on speed: fast and iterative development cycles allow teams to respond promptly to change and incorporate feedback into their work quickly. This is quite different from the sequential nature of service design used in ITIL where every task follows well-defined steps or processes until it becomes completed. The interviewee was sceptical about whether sprints were compatible with detailed procedure frameworks provided by ITIL since they may inhibit rapid adaptation due to too many procedural formalities.

One major challenge highlighted during integration between these two frameworks revolves around differences in pace and flexibility. ITIL processes are designed to ensure stability as well as predictability in managing information services which may conflict with the dynamic features common in agile practice. For instance, there can be a mismatch between the fast response times required within typical Agile settings and the rigorous documentation needs imposed under ITIL's change approval procedures.

Moreover, the product owner pointed out that Agile's focus on continuous improvement and frequent iterations might not seamlessly align with ITIL's emphasis on risk management and meticulous process adherence. For example, Agile's sprint reviews and retrospectives encourage ongoing adaptation, which might be opposite to ITIL's change management processes that require thorough review and approvals before any changes are implemented.

A possible way of addressing these challenges could involve creating a tailored approach inspired by both agile and ITIL methodologies. This means making certain processes within ITIL more adaptable so that they can allow faster cycles without losing control or predictability which are brought about by this framework. For example, daily stand-ups or sprint planning

sessions from Agile can be integrated into service operation processes under ITIL to enhance responsiveness among teams.

Moreover, the Kanban method in Agile may serve as a link between iterative work done during sprints and the process-driven nature associated with ITIL. According to the product owner, Kanban's visual management tools can help to relate structured processes found in ITIL service design stage to lined-up items brought by each iteration under scrum thus enabling smoother transitions and closer alignment between the two frameworks.

In conclusion, while there are significant challenges in integrating iterative Agile practices with the structured methodologies of ITIL, these challenges are not insurmountable. With careful planning and adaptation, organizations can harness the strengths of both frameworks to enhance their IT service management capabilities. Such integration requires a deep understanding of both methodologies and a commitment to developing a hybrid approach that respects the principles of both Agile and ITIL. This can lead to improved service delivery and a more adaptive IT service management environment.

In summary, despite the fact that there are some obstacles to aligning iterative Agile practices with ITIL's structured methodologies, these difficulties are not impossible to overcome. Organizations can blend both frameworks to strengthen their capabilities in managing IT services if they plan well and adapt the plan carefully. Successful integration calls for a profound comprehension of each approach and commitment toward establishing a blended methodology that respects principles from both frameworks. This could bring a better service delivery paired with an adaptable environment for managing IT services.

### 4.2.4 Agile's Effects on Team Dynamics and Responsibilities

Implementing Agile methodologies significantly changes team dynamics and realigns roles within IT service management. One of the insights from interviewing the product owner is that Agile has the potential to reorganize the whole structure of teams, cooperation between colleagues, and individual roles within an enterprise.

Agile methods are based on teamwork, which differs substantially from traditional hierarchical systems. The shift implies self-organizing, multi-disciplinary teams that have authority over decision-making and independent control of their flow. Ownership is another aspect fostered by Agile among team members, every participant is not just an individual performer but becomes actively involved in all stages of project implementation.

In an Agile working environment, the leader's or manager's role often becomes like a facilitator or coach. Rather than just telling team members what to do, leaders help people excel at what they're best doing under new circumstances brought by this paradigm change in methodologies. Consequently, such adaptation can result in higher motivation levels among employees who can feel more appreciated as their input is more recognized as they are directly contributing towards the final results achieved by the group itself. To improve morale within teams working according to these principles it should be remembered that leadership in Agile means guiding the members through the processes rather than ordering them what to do in each step.

Moreover, Agile practices encourage frequent communication and collaboration, both within teams and across different departments. Daily stand-ups, sprint planning meetings, and retrospectives are not just procedural necessities but also crucial for fostering open communication, addressing issues promptly, and adapting to changes swiftly. The product owner noted that this ongoing communication helps in quickly identifying and resolving conflicts, ensuring that the team remains focused on achieving its goals.

Agile also introduces new roles, such as the Scrum Master and Product Owner, each with specific responsibilities that support Agile processes. The Scrum Master focuses on ensuring that the team adheres to Agile practices and helps remove any obstacles that could be seen as an impediment to the team's progress. On the other hand, the Product Owner works to align the team's efforts with customer needs and organizational goals, serving as a bridge between the team and external stakeholders. These roles are crucial in maintaining the balance between following Agile methodologies and meeting business objectives.

The impact of agility on team dynamics also involves how tasks are assigned, monitored, and controlled within groups. According to the Product Owner, in Agile every member should actively participate during estimation or planning meetings which not only improves accuracy but also increases commitment towards achievement and shared responsibility.

In summary, the adoption of Agile approaches transforms team settings through collaboration, communication, and adaptability. This change enhances cohesion among members leading to optimal utilization of available resources thereby increasing efficiency levels besides being consistent with current job values that promote flexibility, and people involvement paired with continuous learning. Observations made by the PO underscore significant adjustments fostered by these system structures within organizations as well as the duties performed by key team

members. At the same time, it is important to emphasize the need for clearly stated and defined responsibilities for each employee to maximize the benefits that these Agile methods can provide for organizations.

### 4.2.5 Future Trends and Technological Advances

Emerging trends and technological advancements are expected to have a great impact on the future of service management. This statement can be supported by using the thoughts shared by the product owner who has experience in both traditional and Agile frameworks.

He noted that artificial intelligence and machine learning have already become increasingly integrated into service management systems. These technologies not only automate repetitive tasks but also improve decision-making processes through advanced analytics which help in providing more detailed insights from data. With AI's capability of recognizing patterns and predicting outcomes, it becomes possible to manage services proactively so that problems are solved before they turn into larger issues. This predictive approach towards managing services may change how teams deliver them by putting more emphasis on efficiency during operation as well as foresight in planning for their sustainability.

Cloud computing has already started transforming service management by offering scalable and flexible solutions that can support the dynamic nature of modern IT environments. The PO said that cloud technologies enable faster service deployment, improve collaboration among teams involved in delivering those services, and reduce operational costs through sharing resources among multiple users or customers. As cloud-based services continue evolving, they are likely going to play a significant role in facilitating agility within response timeframes required for effective service delivery management frameworks.

The discussion also touched upon the potential challenges that these technological and methodological shifts might bring. For instance, the PO expressed concerns about the steep learning curve associated with new technologies and the cultural adjustments required to adopt Agile practices extensively. Overcoming these challenges will be crucial for organizations to harness the full potential of these advancements in service management.

In conclusion, the future of service management is set to be deeply influenced by technological innovations and the broader adoption of customer-focused and Agile practices. These trends promise to enhance the efficiency, responsiveness, and quality of service management, aligning it more closely with the evolving needs of businesses and consumers. The insights provided by

the product owner shed light on the transformative impact of these developments, underscoring the importance of adapting to these changes to remain competitive in a rapidly evolving technological landscape.

### 4.2.6 Summary

The interview with the product owner has given a comprehensive analysis of developing strategies and challenges facing product management in technologically advanced environments. This has led to changing development strategies for the products with a high emphasis on Agile methodologies and continuous feedback mechanisms. The result of the interview can be summarized in the following key areas:

1. **Adoption of Agile Methodologies and Continuous Improvement**

   Well-designed product development is an aspect that was highlighted by a Product Owner who insisted on its importance in the process of business management and also gave suggestions for improvement. It is critical for teams to be quick at adapting to market dynamics through Agile practices like Scrum or Kanban, which allow quick iteration and improvement of products based on rapid customer feedback. Methodical use of these approaches helps in better organization, setting priorities, and enhancing cooperation among teams.

2. **Challenges of Iterative Thinking**

   According to the product owner, the iterative process does not come without its challenges. These could range from keeping the focus on the targeted customer group to continuously adjusting products based on their reactions and newly discovered information regarding them, hence maintaining consistency becomes a challenge. There are ongoing concerns about the so-called “scope creep” where projects continue to evolve without defined deadlines, sometimes leading to delays in delivery schedules due to resource constraints or even exceeding budgetary allocations if any initial financial projections were accompanying such proposals. Handling these problems demands good project management skills with open communication between stakeholders and clear goals that need to be achieved within particular timeframes.

3. **Impact of Agile on Team Dynamics and Responsibilities**

Involvement in agile methodologies can lead to significant changes in team dynamics and the distribution of responsibilities among members of those groups. However, Agile encourages individual autonomy within teams that also take collective responsibility for the successful completion of tasks as was said by the PO. It can improve transparency, and accountability as well as boost efficiency but it requires high levels of coordination among employees along with constant interaction. The fluid nature of roles within an Agile environment may lead to confusion in terms of responsibilities, necessitating clarity and guidance from the leaders.

4. **Future Trends and Strategic Planning**

The product owner looks forward to integrating more data analytics and machine learning into the development process of products for better prediction of customer trends. For this reason, decision-making regarding product features and marketing strategies could improve in the future with the adoption of this predictive approach. Furthermore, there has been greater stress on designing products sustainably and according to ethical standards that reflect wider social values and consumer expectations.

## 4.3 Findings from interviews

### 4.3.1 Recommendations

The continuous development and changing business requirements brought by new technology advancements calls for the constant evolution of IT service management practices. This part of the work presents critical suggestions (as can be seen in **Figure 7**) taken from the interviews with support engineers as well as a product owner, in addition to the knowledge gained from reviewing and analysing previous academic research papers. The intention behind these recommendations is to improve communication channels, simplify knowledge bases, incorporate predictive technologies into systems, and build solid frameworks that could help integrating Agile methodologies with traditional ITIL processes. Each suggestion has been supported by relevant references that point out possible impacts on efficiency, responsiveness, and adaptability within ITSM practice areas. Further discussions and research might be needed to explore what these proposals mean practically during the implementation phase while this summary can help to offer organizations a guide towards realizing optimal efficiency levels for

their information technology service delivery capabilities under rapidly changing environments.

**Figure 7**
Recommendations based on interviews and research


1. **Adoption and Integration of Real-Time Communication Tools**

   For agile communication and collaboration in IT service management, it is necessary to adopt and integrate tools for real-time communication. Microsoft Teams, Slack, and Jira are some platforms that can be used as messaging services but they also play a major role in breaking down barriers between departments which enables quick problem-solving ability as well as supports agile methodologies.

   This is because they offer communication channels that are uninterrupted and kept together in a central system, which supports IT service integration and alignment as described by ITIL. In this regard integrating these tools helps to maintain the continuous service improvement loop recommended by ITIL thereby encouraging transparency, accountability as well and constant dynamic responses to the IT services needs leading to a more efficient way of managing services which ultimately translates to better service quality.

2. **Enhancement of Knowledge Management Systems**

   Enhancing knowledge management (KM) systems in ITSM involves integrating advanced search engines and organizing knowledge repositories more efficiently. Effective KM systems are crucial for quickly retrieving information and establishing a culture of continuous learning and improvement. Weng and Weng (2009) discuss a comprehensive KM model in one of their papers that integrates various functions such as data collection, information integration, knowledge processing and presentation. This model supports the entire knowledge lifecycle within ITSM, facilitating faster resolution of issues and enhancing knowledge sharing among IT staff (Weng and Weng 2009).

   The structured approach to KM advocated by Weng and Weng (2009) also ensures that knowledge is not only accumulated but effectively utilized to support decision-making and service improvement. By implementing such a model, IT organizations can significantly improve their service management practices, making them more adaptive to new challenges and capable of capitalizing on the collective knowledge of their human resources.

3. **Implementation of AI for Predictive Problem-Solving and Automation**

   Implementing AI for predictive problem-solving and automation within ITSM can transform the landscape of IT service delivery. AI technologies, such as machine learning and natural language processing, enable IT services to predict potential failures and automate routine tasks. Blinnikova and Nesterova (2020) highlight the use of AI in incident management, where AI tools not only predict issues before they become critical but also automate the response processes, thereby enhancing operational efficiency and reducing downtime (Blinnikova and Nesterova 2020).

   The proactive capabilities introduced by AI in ITSM not only streamline processes but also improve the overall customer service experience by ensuring that services are reliable and issues are swiftly addressed. This shift towards predictive IT service management helps organizations stay ahead of potential problems, minimizing the impact on business operations and enhancing customer satisfaction.

4. **Development of Agile-ITIL Hybrid Frameworks**

   Developing Agile-ITIL hybrid frameworks involves blending the flexibility of Agile methodologies with the structured approach of ITIL to optimize ITSM practices. This integration addresses the dynamic needs of modern IT environments, providing the agility needed to respond rapidly to changes while maintaining the rigorous standards required for effective service management. Verlaine (2017) discusses the potential of Agile principles to revitalize traditional ITIL processes, making them more adaptable and responsive to the needs of the business (Verlaine 2017).

   Such hybrid frameworks not only enhance the responsiveness of IT service management but also ensure that it remains comprehensive, consistent, and compliant with established standards. The synergy between Agile and ITIL facilitates continuous improvement and enables ITSM processes to evolve in alignment with technological advancements and changing business requirements.

### 4.3.2 Challenges

While the strategic recommendations outlined in the previous section may seem promising in terms of improving IT service management, they can be difficult to implement successfully in practice. Indeed, these challenges, as identified in **Figure 8**, are varied as they are associated with cultural inertia, technical complexity, regulatory compliance as well and even scalability problems which all pose various obstacles for any evolving IT organization. This part of the work examines the main difficulties identified through industry observations and academic studies in order to demonstrate real-world problems faced by enterprises when trying to blend new technologies with previously established ITSM frameworks. This chapter explores each possible challenge individually and supplies it with appropriate references from scientific literature that not only describe but also propose possible solutions therefore giving both industry professionals and scholars a comprehensive picture.

**Figure 8**
Possible challenges during implementation


1. **Cultural and Organizational Resistance**

   When implementing new technologies and methodologies in ITSM, cultural and organizational resistance is one of the most significant challenges. In many cases, traditional IT operations have long-standing practices and employees are reluctant to change, especially where this means adopting tools that are equipped with AI or other emerging technology. To challenge conventional IT practices, Vijayakumar et al., (2023) discuss how artificial intelligence-powered IT Service Operations introduces different workflows that may disrupt long-established roles and responsibilities. The resistance can manifest as scepticism towards new solutions' effectiveness or unwillingness to give up familiar processes (Vijayakumar, Seetharaman, and Maddulety 2023).

   Overcoming this resistance requires effective change management strategies that take into account both human and technical aspects of IT transformations. For instance, education, training as well as the involvement of staff during the transformation process are vital in smoothing out transitions. According to Abdelhakim et al., (2022), top management should be accompanied by good communication skills while aligning information technology projects with corporate strategies helps mitigate resistance. These tactics create an environment where people understand and appreciate the

benefits brought by new methods and tools so team members can accept agility within the department more easily (Abdelhakim, Abdeldayem, and Aldulaimi 2022).

2. **Complexity in Integrating New Technologies**

   The introduction of AI among other new tools into existing frameworks of ITSM might lead to increased complexity levels. This complexity is not just technical, it is also organizational since the systems need to be compatible with each other and additional training is needed for employees to effectively use new tools. According to Tariq, Poulin, and Abonamah (2021), technical complications and fear of the unknown can hinder successful integration towards operational excellence using AI. These challenges involve points such as data compatibility problems and significant initial investments are also required among others like configuring AI to operate with legacy systems which can pose complex impediments (Tariq, Poulin, and Abonamah 2021).

   To deal with such complexities, organizations should take a stepwise approach when integrating technologies where pilot projects could be used as starting points thereby allowing for gradual adjustment and learning. Additionally, Marhraoui et al., (2021) propose an integrated human-AI framework that combines digital tools with human resource practices to enhance organizational agility. This not only facilitates the smooth integration of new technology but also ensures that artificial intelligence systems work within human capabilities and align well with the goals of the enterprise thus maximizing the benefits associated with digital transformation (Marhraoui, Idrissi, and El Manouar 2021).

3. **Balancing Agility with Compliance**

   It becomes a challenge to balance the flexibility brought by Agile methodologies and the structured requirements set by ITIL. Sometimes rapid iterations, which are emphasized by agile practices, may clash with the detailed nature of process orientation found within ITIL creating unique challenges during the implementation phase. The need for balance calls for careful planning coupled with adaptability that guarantees governance, risk management as well compliance. It could be complex to align two such approaches resulting in gaps where a lack of adherence or documentation could occur, therefore, affecting service quality or regulatory compliance.

In order to overcome this hurdle hybrid models which leverage strengths from both Agile and ITIL should be considered by organizations. It is important to design such models in a way that ensures the process discipline of ITIL is not undermined even as adaptability brought by agile can enhance it. Regular checks coupled with audits can assist in ensuring that the integration of agile practices into ITIL frameworks remains compliant with all required standards and regulations. Another thing is staff training sessions or workshops aimed at equipping them with the necessary knowledge on how they can operate effectively within this hybrid framework so they are enabled to respond quickly to changes, while also following previously established procedures.

4. **Scalability of AI Solutions**

When implementing AI in ITSM, especially in large-scale and diverse IT environments, the issue of scalability is a critical concern. AI solutions need to be able to scale across different departments within an organization besides integrating well with various IT systems. The initial investment for artificial intelligence deployment may demand huge amounts of capital while there can be continuous costs incurred during maintenance and upgrade of AI models in order to prevent them from becoming obsolete too soon. Tariq, Poulin, and Abonamah (2021) discuss the importance of developing AI solutions that can adapt and evolve with the organization while noting that the scalability of these solutions is key to achieving operational excellence (Tariq et al., 2021).

Moreover, in order to make AI solutions more scalable, organizations can start the process by building up strong data infrastructures that can cope with AI applications and machine learning algorithms at different levels and in various environments. What is equally important is involving stakeholders from different departments when planning and implementing AI so various requirements set by different departments inside the company are considered. It is necessary for employees to continuously learn about what artificial intelligence is capable of and how it can be used as well as keep them updated on new developments. This could help with the adoption of novel technologies and tools to the IT service management practices leading to positive contributions towards achieving organizational goals with the help of such systems.

## 4.4 Introducing software solutions

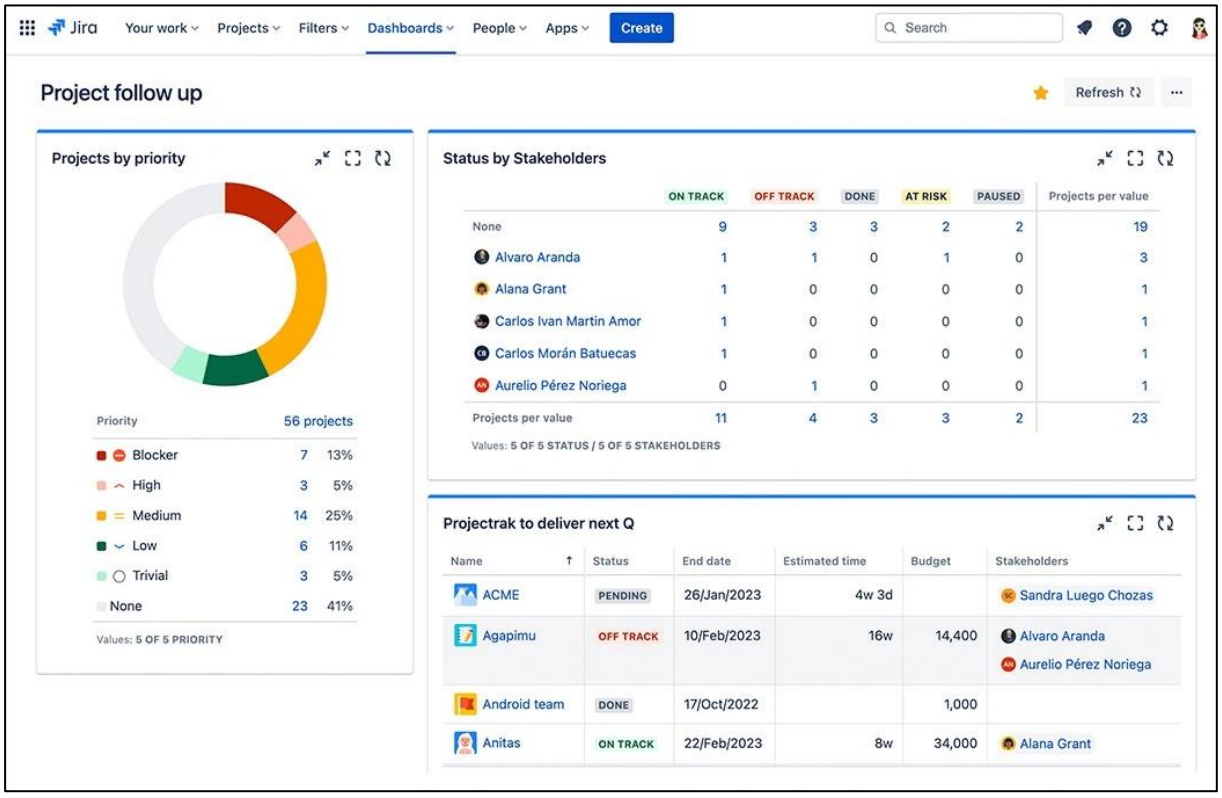
In this section, two recommended software solutions are introduced and explained in detail highlighting their advantages, possible disadvantages, and the challenges that departments can face when they try to implement those software. This discussion is designed to provide actionable recommendations for teams operating under the ITIL framework, offering guidance on how Agile methodologies and tools can be adopted. By integrating these solutions, the handling of support tickets and the maintenance of well-organized knowledge bases are enhanced, thereby improving operational efficiency and responsiveness.

### 4.4.1 Jira

Jira is a tool for project management that helps teams keep track of and organize tasks, bugs, and feature requests. It is particularly flexible with regard to Agile methodology-based projects but also powerful enough for effective support of ITIL-aligned processes. Its workflows can be customized as it allows for real-time collaboration as well as detailed reporting, all of which are necessary for any successful project or service management operations.

In Agile development environments, Jira has become synonymous with managing sprints, backlogs, and other artifacts used in software development methods. It can be employed by teams during planning phases and tracking throughout the process from start to release while ensuring visibility across all areas of the process. It also creates visual dashboards showing the team workflows, ticket status summaries, project priorities, or even roadmaps for long-term goals and plans as can be seen in **Figure 9**. With support for different frameworks like Scrum or Kanban among others, this tool allows visualization of the work using task boards that can easily be updated while moved across different stages of the process workflows.

**Figure 9**
Jira Project Dashboard (Atlassian 2024c)




Though it is mainly popularized within Agile teams, there exist adaptations made towards supporting also ITIL, especially around incident and service request management aspects which are covered by the Jira Service Management tool. By utilizing this integration solution, organizations can get the ability to handle request tickets and automate common tasks. Teams can also link up Jira tickets with Confluence pages thereby creating an extensive knowledge base that can greatly help to react to sudden changes along with other related activities involved in problem management, change management, or configuration management corresponding with the ITIL framework's focus on the service life cycle approach (Atlassian 2024c).

Jira workflows are adjustable to meet the requirements of different teams in an organization thereby ensuring effective management of both Agile and ITIL processes. Through custom workflows, automation can be done on transitions, notifications as well as assignments depending on various triggers and conditions which leads to streamlined operations and reduction in operating costs.

One way that Jira promotes collaboration is by providing tools that enable members of the teams to communicate directly within the context of individual tasks or projects. Comments,

attachments, and real-time updates ensure that everybody who is working on a project or service process knows what others are doing thereby minimizing uncertainty and delays. It has powerful reporting capabilities that help to track progress made by the teams thus enabling them to identify areas where their workflow needs improvement. These tools are also important for keeping the projects transparent as they provide insights necessary for informed decision-making.

Kanban boards in Jira are a good way to visualize work, limit work-in-progress, and ensure smooth workflow across project tasks. Derived from lean manufacturing principles, Kanban boards are a visual management system that helps teams follow their workflows and projects more efficiently in Jira. Each task or issue is represented as a card on the Kanban board that moves between different columns representing different stages of the workflow (such as To Do, In Progress, Done). With this setup, teams can see in which stage each task is at any given moment, while they can also manage workloads, and adjust resources dynamically to meet project demands. The breadth of team sizes and project types makes it possible for continuous delivery processes while using Kanban with Jira hence becoming an essential tool for real-time project environments when organizations want to optimize efficiency and throughput (Atlassian 2024d). Kanban was also mentioned by the product owner as a great Agile method to complement ITIL tools and existing workflows.

Another useful feature of Jira is its ability to integrate with many other tools such as Confluence which can be used for documentation purposes, alongside various development environments used in continuous integration/continuous deployment (CI/CD) pipelines. This integration ensures a smooth information flow between different platforms used within an organization where data may need to be exchanged frequently.

However, despite the numerous benefits offered by this tool, some challenges also exist that should be considered, especially during the initial implementation stages and maintenance procedures. For example, customization of specific workflows may demand substantial investment upfront regarding time and resources. Additionally, when companies grow and add more teams to Jira, it becomes difficult to keep configurations consistent. It is possible to have many custom workflows, fields, and schemes but this will only result in chaos and make it harder to standardize the system (TeamBoard 2023). It is important to take these challenges into account when deciding the implementation steps and time frames for all organizations.

All in all, Jira can revolutionize project management and IT service delivery functions when properly deployed and managed within any company or department. The rich set of functions coupled with flexibility makes it suitable for environments operating under Agile or ITIL framework thus it can act as a single platform supporting complex workflows around diverse team structures. Organizations adopting Jira into their ITSM practices together with project management can see higher levels of efficiency, more collaboration as well transparency that lead to greater success rates within various IT initiatives and projects.

### 4.4.2 Confluence

Integrating the ITIL framework with Agile methodologies presents a way for businesses to make their IT service delivery faster and more efficient. Nevertheless, it can be difficult to combine these two seemingly different models successfully. In such cases, Confluence which is a powerful knowledge management and collaboration platform developed by Atlassian, can serve as an ideal solution that ensures integration is seamless.

Confluence's strengths lie in its ability to centralize documentation, foster collaborative knowledge management, and streamline workflows. Robust documentation plays an important role in both Agile and ITIL. That’s why this system provides a common storage area for such materials as user pages, product backlogs, or sprint plans as well as ITIL process guides or even complete knowledge bases. This approach ensures that every person involved has access to the most up-to-date information which contributes to transparency across development teams cooperating with operations ones.

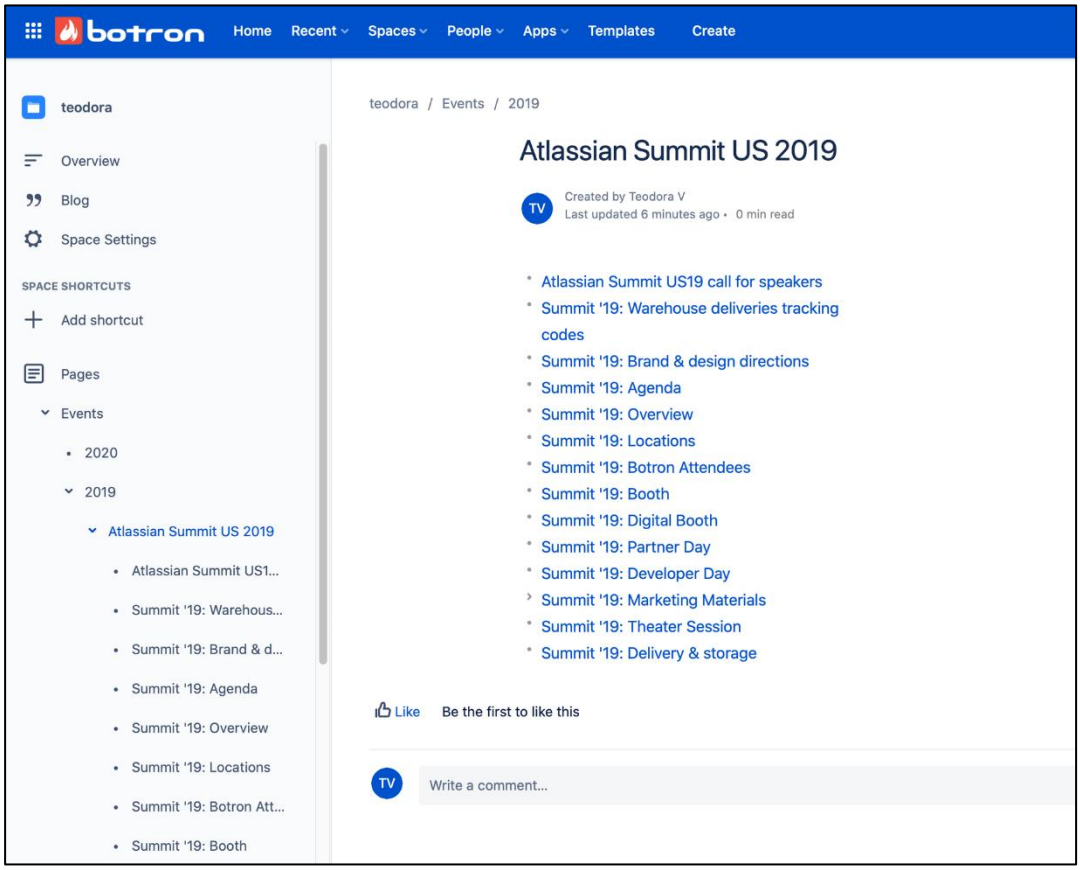
Furthermore, Confluence encourages collaborative work around shared knowledge creation. Teams can create wikis, edit meeting notes, or decision logs within this system so that they can document their valuable insights gained throughout various stages of the development or service lifecycle. Such practice breaks down silos while fostering a sharing culture which is necessary for effective troubleshooting and continuous improvement activities. Additionally, Confluence seamlessly integrates with other solutions from the Atlassian family like Jira. Thanks to this feature it becomes possible to link particular pages created in Confluence with corresponding Jira tickets while dealing with service requests. Therefore any team member can search and find pages containing specific incident troubleshooting steps right from the related SR (service request) which can help faster resolution times. (Atlassian 2024a)

By using different features offered by Confluence organizations can overcome some of the challenges met during the incorporation of Agile into ITIL environments. Communication between teams following Agile methodologies and those implementing ITIL processes often lacks some key points because of a gap in communication, as they share the same goals but express them differently. Confluence can help with this as every team can describe their own activities as well as document them step-by-step, establishing shared objectives and understanding which points could enable the effective flow of information between the parties involved in the process.

Another area where Confluence can be helpful is the standardization of ITIL processes. Incident, problem, change, or configuration management procedures can be standardized within this system thanks to its wide range of functionalities. These documented steps serve as reference points throughout the service lifecycle ensuring that incidents are handled consistently across the entire organization while reducing risk connected with human errors due to a lack of knowledge about what should be done when faced with specific situations (Atlassian 2024a). In addition, transparency is increased because all participants have access to the latest data related to project progress, operational procedures, or service requests and this leads to informed decision-making as well as early detection and solving problems wherever possible.

Confluence also allows for building up ready-to-use knowledge bases (**Figure 10**) and providing teams with standardized procedures. This means that if one of the team members needs to solve a particular issue quickly it will not be necessary to search through tons of outdated documents or ask colleagues who might have some knowledge about it, instead just open the appropriate page within Confluence where everything has been already gathered so time spent on looking for answers decreases significantly since everyone can see related notes, documents, and screenshots from similar cases. Moreover, such method helps avoid situations when the person responsible for solving certain problem leaves the company without transferring his/her knowledge to the other employees. Additionally, this platform can be used to centralize knowledge for change management by building a central repository for request templates, approval processes, and risk assessment procedures. This ensures a smooth and controlled change management process while promoting transparency and stakeholder involvement (Atlassian 2024a).

**Figure 10**
Knowledge Base Example in Confluence (Atlassian Community 2020)




In Agile-ITIL integration, the value of Confluence is increased even more by its seamless integration with other popular tools in this space. For example, Jira and Confluence can be integrated to help teams link their pages directly to Jira tickets or user stories. What happens is that the teams can get easy access to relevant documentation from their traditional ticketing systems which can promote a quick understanding and collaboration among different stakeholders.

To conclude, Confluence can act as a bridge between Agile and ITIL methods. This platform enables knowledge sharing, collaboration, and improved process transparency, all of which enhance efficiency in teams' performance thereby streamlining service delivery and leading to higher levels of organizational achievements. Therefore, this tool can help companies in their journey towards integrating Agile into existing IT Service Management Processes while also maximizing the potential benefits from both frameworks.

# 5 Conclusion

The purpose of this work was to identify recommendations and key challenges that companies could face when they want to improve their workflows by implementing Agile tools and methods into existing Service Management practices. In the Methodology section, the following two questions were formulated: “How agile methodologies could complement and enhance traditional ITIL practices when it comes to IT service management in business settings?” and “What technologies that are categorized as Agile can be used in existing systems to ensure continuous improvement and shorter request resolution times?”. To find the answers to these questions, two main methods were used. The first method included collecting and analyzing existing literature created in this topic while the second part was to conduct qualitative interviews with experts working in the field of service management.

Three interviews were conducted in total, one with an experienced Product Owner who has worked for several international companies throughout his career using both ITIL and Agile methodologies. The other two interviews were with two Support Engineers working at different multinational companies in Budapest, Hungary. The main focus areas during the semi-structured interviews were the following: Agile Principles in Processes, Stakeholder Engagement and Communication, Knowledge Management and Culture, Ensuring Adaptability in Processes, Tools and Collaboration, Balancing Flexibility and Standardization, Operational and Developmental Integration, Data-Driven Decision Making and Resource Allocation. Some of these areas were covered by both lists of questions while others were only covered by either the questionnaire for the PO or the Support Engineers.

Combining the key takeaways from the interviews and the analysis of previous works on the topic four recommendations and four key challenges of implementing these recommendations were identified. The recommendations included the following points: Adopt and Integrate more Real-Time Communication Tools, Enhance and Develop Knowledge Management Systems, Implement AI for Predictive Problem-Solving and Automation, Develop and Invest in Agile-ITIL Hybrid Frameworks. Identified challenges included Cultural and Organizational Resistance, Complexity in Integrating New Technologies, Balancing Agility with Compliance, and the Scalability of AI Solutions. These were not just identified but also explained and discussed combining the findings of the interviews and the analysis of previous scientific works.

After discussing the results of the interviews and combining those with the literature review and analysis, software solutions were listed and recommended in the last part of the Results

section. The purpose of this part was to provide actionable recommendations for teams operating under the ITIL framework, offering guidance on how Agile methodologies and tools can be adopted. One of the software introduced is Jira which helps teams to keep track of the workflows while organizing tasks and requests. Its built-in tools like the Kanban boards can help teams to be more efficient and solve problems faster in the service management field. The second tool is recommended to help more with knowledge management and team collaboration using knowledge sharing. Confluence can aid organizations in building and maintaining a knowledge management system with effective search tools and integrations with other popular solutions in the market. Furthermore, the challenges associated with implementing these solutions were also discussed in the corresponding sections of this thesis.

The limitations of this research are primarily related to its scope and methodology. First, being centered around ITIL means that there could be other frameworks in service management that could be considered in a wider scope of the subject. This greater emphasis on ITIL may make the work less applicable to companies using different systems as their main framework for managing IT services. Secondly, only a few individuals were interviewed, they were all from the same city and working for similar businesses which could question whether the findings drawn from the interviews can be universally applied within diverse organizational contexts or across industries. Therefore, this limitation could restrict generalizability since practices and difficulties faced by companies connected to ITSM may vary significantly across different environments which are not covered in this work.

There are many possibilities for future research that could expand on the findings presented in this thesis. In particular, a wider recognition of the benefits derived from merging Agile with ITIL could be accomplished through cross-comparative analysis between different ITSM frameworks and industries. Furthermore, a longitudinal research could be conducted to explore how sustainable Agile practices within IT service management systems are over time while exploring what long-term impacts these methods can have. Additionally, conducting interviews with more people coming from different countries and diverse companies could also be a good path to continue the research building on this work.

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# Appendices

## Appendix 1

Interview questions for Product Owner

Date of the interview: 8th of April 2024

1. **Strategic Integration and Framework Understanding**:
    - From a strategic perspective, how do you see the role of Agile methodologies and ITIL practices in enhancing IT service management?
    - What would you consider the biggest obstacle to combining the speed of agile methods and the reliability of ITIL principles when working on value-creating products?
    - Can you provide examples of when combining Agile and ITIL practices could have led to improved service delivery times or quality?
2. **Stakeholder Engagement and Communication**:
    - How would you engage and communicate with stakeholders regarding the adoption and benefits of both Agile and ITIL practices?
    - Is the vision regarding the value created by the product and individual steps clear for you, the teams and other stakeholders you work with?
3. **Balancing Flexibility and Standardization**:
    - What strategies do you employ to maintain a balance between standardization (ITIL) and flexibility (Agile) in day-to-day work?
    - Do you consider the end-to-end value stream when making a decision, or do you concentrate more on individual processes?
    - Is it challenging to balance between business functionalities (like getting the product out fast) and guaranteeing service availability (avoiding future incidents) when prioritizing backlog items?
4. **Operational and Developmental Integration**:
    - Do you feel like the architecture and team structures are organized around value streams and business capabilities to facilitate effective product delivery?
    - How do shared services and open APIs play a role in accelerating innovation within your team or organization?
    - In the context of Agile teams, how do you manage incidents and requests while maintaining focus on product development and delivery?

- Could you describe how your organization identifies and organizes around strategic epics, product team backlogs, and service management queues to integrate Agile and ITIL practices effectively?
- Based on your experience do organizations understand the challenges and added value of combining agile and service management methods?

5. **Tooling, Data-Driven Decision Making, and Resource Allocation**:
    - Which tools did you find most helpful in reducing incidents that disrupted the service quality in projects you worked on?
    - What challenges have you faced in ensuring interoperability between different tools used by teams for ITSM and Agile practices, and how have you addressed them?
    - How can you ensure transparency in the backlog to clearly communicate the value delivered, risks, and customer insights?
    - What approaches would you take to become more data-driven in your decision-making processes related to product development and service management?
    - Is it challenging to position the right people in the right roles to build effective value streams that align with both Agile and ITIL principles?

**Appendix 2**
Interview questions for Support Engineers

Date of the first interview: 23rd of March 2024
Date of the second interview: 6th of April 2024

1. **Implementation of Agile Principles in Processes:**
    - Could you identify Agile methodologies implemented in the support processes within your organization or team?
    - Which methods would you keep and consider efficient, and which one would you change to improve IT service management?
2. **Stakeholder Engagement and Communication:**
    - Could you describe strategies used for engaging with stakeholders to communicate while you use Agile methodologies with ITIL practices in the support domain?
    - How does the support team ensure clear and effective communication with other teams and stakeholders regarding requests or incidents connected to service management processes?
3. **Knowledge Management and Culture:**
    - Do you think that knowledge management has an important role in supporting Agile and ITIL integration within support teams' operations?
    - What are the key attributes of the systems connected to knowledge management and what gaps could be an impediment to solving requests and incidents effectively?
    - What tools can cultivate a quality-oriented culture within the support teams, and what impact can these have on service management based on your experience?
4. **Ensuring the Adaptability of Processes:**
    - In what ways could a team ensure that ITIL-based service management processes remain adaptable to changes and challenges based on your past experiences?
    - Do you think that Agile principles contribute to the flexibility and responsiveness of your support processes?

5. **Tools and Collaboration:**
    - Could you think about examples of how collaboration and automation have been used to simplify support processes within your day-to-day tasks?
    - Do you think that the logs that you use during investigating a problem are useful for the final solution or their quality and quantity should be improved?
    - Do you think that tools or technologies could be particularly effective in automating and streamlining support tasks and workflows?