

Final Project 2

PMG 497

Project Template

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Project title

Student name

Bader Mohamed foulata

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Faculty of Management - Midocean University

Faculty member- Faculty of Management- Midocean University

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Dedication

I dedicate this project to my family, who have continuously supported and believed in me, and this is all the motivation I needed to succeed. It is also dedicated to potential business creators and startup groups of individuals who seek to be innovative and grow in the business environment.

Abstract

Purpose:

The research scope will investigate the impact of Agile Project Management (APM) on operational effectiveness in startups across various business sectors, including digital marketing, consulting, e-commerce, financial services, and product design. The study aims to fill the

knowledge gap on how effective APM could be outside of the IT scope, shedding light on its impact on efficiency rates, such as time-to-market, resource allocation, and customer satisfaction.

Methodology:

Using a qualitative methodology, the study followed a semi-structured interview with 12 participants of 6 startups that were between 1 and 5 years old, and headquartered in urban innovation centers. The thematic analysis with NVivo software has been used as a tool to interpret data supplemented by secondary literature and Agile artifacts to ensure a strong interpretivist research, which adheres to the research onion model.

Findings:

The results show that APM is positively contributing to efficiency in operations involving iterative, collaborative, and adaptive development. The most successful framework was Scrum, which had continuous feedback loops and iterative planning that increased performance. The identified issues, which were addressed, included resistance to change and resource limitations, but with the aid of leadership and training.

Originality & Implication:

This research is important to the scholarly community as it puts research on APM in a non-IT startup on the agenda, filling in the gap in the theoretical literature on the topic of small businesses. Pragmatically, it provides practical advice to entrepreneurs, venture capitalists, and incubators trying to maximize the application of the APM to streamline complex startup situations and maximize decision-making, resource levers, and product output.

Keywords: Agile Project Management, Operational Efficiency, Startups, Scrum, Qualitative Research, Non-IT Sectors, Thematic Analysis

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1. Chapter 1: Introduction

1.1. Research Background

As competition and interdependence intensify in the 21st-century globalized economy, startups have proven to be a vital vehicle behind innovation, employment, and economic change. These startup firms tend to work in an atmosphere of uncertainty, rapid change, and high pressure to produce goods and services quickly and precisely. Startups are typically constrained

by limited resources, poorly established systems and procedures, and fluid business models, in contrast to the systematic systems and substantial capital found in established corporations. In this way, project management becomes significant in guaranteeing their survival and development.

Conventional project management methods, e.g., the Waterfall model, are sequential and inflexible, and their phases are defined (e.g., initiation, planning, execution, monitoring, and closure). Such methodologies should provide more clarity and control, but are typically too rigid to suit the dynamic, microevolutionary nature of startups, whose project requirements are bound to change in response to market and innovation opportunity cycles. Such rigidity usually leads to project slippages, cost escalations, and an inability to fulfil the expectations of the customer.

Agile Project Management (APM) has become an attractive option for alleviating these challenges due to its flexibility and iterative and customer-driven capabilities. Agile, initially created for software development, has evolved into a framework applicable across various sectors, including business operations, product development, marketing, and the financial industry. Agile focuses on shared planning, continuous improvement, flexibility, timely delivery, and responsiveness to change. It works in terms of iterative cycles (so-called sprints or iterations), which enables teams to prevent possible failures in delivering small yet viable parts of a project as much as possible or as regularly as possible.

The popularity of agile methodologies such as Scrum, Kanban, or Lean Agile among startups is a result of their suitability for fast, uncertain business environments. The frameworks encourage transparency, teamwork, rapid prototyping, and circles of feedback, which can be very effective in raising the level of productivity and customer fulfilment. Agile enables startups to

run tests rapidly, refine ideas based on customer feedback, and launch advanced versions of their products or services in shorter durations.

Nevertheless, despite the popularity and intuitive appeal of Agile, there has been a notable lack of understanding in the startup business community about how Agile Project Management can enhance operational efficiency beyond the software sphere. Although anecdotal evidence and practitioners' first-hand experience suggest Agile's effectiveness, scholarly studies quantifying its impact on efficiency-related business outcomes, such as resource consumption, time to market, and quality control in startup companies, are underrepresented. The study aims to bridge that gap by critically examining the place of Agile Project Management in enhancing operational efficiency in the business industry and in startups in particular. Operational efficiency here implies that a startup manages to run internal processes efficiently, reduce latent lines, maximise production, and complete goals without lowering the quality or customer value. Due to its direct approach toward real-world cases, practices, and outcomes, the study will reveal how startups deploy Agile, what obstacles they face, and which strategies give them direct benefits in terms of performance improvements. Moreover, due to the increase in startup ecosystems across the globe alongside the more dynamic and online environment of business, the importance of learning the strategic use of Agile is becoming more relevant than ever. The scholarly value of this research will include both an elucidation of an intellectual contribution to the field of studying project management and a de facto guide to startup founders, managers, and incubators who want to use Agile as a competitive advantage.

1.2. Research Problem

Although Agile Project Management is globally advertised as a means of enhancing project performance, little research exists in terms of the appraisal of its implications in the startup

industry, especially in the mainline business. Many startups implement Agile without thoroughly understanding its aspects, leading to a patchy implementation and unforeseeable outcomes.

1.2.1. Theoretical Gaps

In practice, the available literature on Agile Project Management centres mostly on big organisations and the IT/software development field. Very little is understood about the operation of Agile concepts within small-business environments, or their efficacy in meeting the operational needs of startups. This absence of theoretical knowledge creates a knowledge gap, which this research attempts to fill.

1.2.2. Practical Gaps

From a practical standpoint, startup founders and project managers often lack clear guidance on how to implement Agile effectively in a resource-constrained and rapidly evolving environment. This can result in the misuse of Agile techniques, leading to reduced efficiency and increased operational risks. Thus, there is a need to examine which Agile practices yield the most benefit in startup operations.

Main Research Problem Statement: What is the impact of Agile Project Management on the operational efficiency of startups in the business sector?

1.3. Research Significance

1.3.1. At the theoretical level

This research contributes to academic literature by expanding the understanding of Agile Project Management beyond its traditional domains. It explores the theoretical underpinnings of Agile practices and their applicability in startups, thereby enhancing the academic dialogue surrounding Agile's flexibility and effectiveness in business environments.

1.3.2. At the practical level

For entrepreneurs, investors, and startup incubators, this research provides actionable insights into how Agile can be adapted to suit the unique challenges of startups. It offers a model for improving operational processes, enabling better decision-making, resource optimization, and faster product delivery—all essential for startup success.

1.4. Research Questions

The research questions include:

R1: How does Agile Project Management influence operational efficiency in startups?

R2: Which Agile frameworks (e.g., Scrum, Kanban, Lean) are most effective in startup environments?

R3: What are the key success factors for implementing Agile in a startup setting?

1.5. Research Objectives

The research objectives include:

- To examine the relationship between Agile Project Management and operational efficiency in startups.
- To identify the most effective Agile practices used by startups to streamline operations.
- To propose best practices for successful Agile implementation in the business startup sector.

1.6. Research Hypotheses

- H1: Agile Project Management has a positive effect on operational efficiency in startups.
- H2: Scrum is the most commonly used and practical Agile framework in startup environments.
- H3: Startups that apply continuous feedback loops and iterative planning achieve higher levels of performance.

1.7. Research Model

The conceptual model for this study includes:

- Independent Variable: Agile Project Management (frameworks, practices, principles).
- Dependent Variable: Operational Efficiency (productivity, resource utilisation, adaptability, stakeholder satisfaction)
- Moderating Variables: Type of startup, team size, industry sector.

1.8. Scope of The Study

The study uses a qualitative approach of research design to investigate and gain insight into the implementation and effects of Agile Project Management and its contribution to efficiency in the operations of startups in the business environment. The qualitative approach is also appropriate in this research study since it provides a deeper exploration of behaviour, processes, and factors surrounding contexts, which cannot be attained comprehensively using the

quantitative measurements. The ability of qualitative methods to bring depth and flexibility is needed since the research objective is to help understand how and why Agile practices impact the internal processes, stakeholder perceptions, and project output of startups. The research will apply semi-structured interviews as the primary method of data collection. A purposive sample of Agile business startups, comprised of founders of startup businesses, project managers, Agile coaches, and the project teams, will be interviewed. The interviews will be used to retrieve experiential knowledge, practical challenges, success stories, and perceived advantages of adopting Agile. The themes used in the design of open-ended questions include decision-making, change in the workflow, teamwork, consulting customers, and dynamism in the strategic adaptation.

Besides interviews, the research might also consider documented case studies, internal process documents, and project reports, plus Agile artefacts (Scrum boards, sprint reviews, and retrospectives) of chosen startups. This multi-sourcing of data will increase the accuracy of results and enable the researcher to develop a rounded picture of the role of Agile in operations. The qualitative data will be analysed using thematic analysis. This approach entails coding and classifying the information into trends and themes observed in the process of carrying out a review. Qualitative data analysis programs such as NVivo can be utilised to help organise and interpret textual data. The qualitative methodology will not only evaluate the success of Agile in operational improvement but also examine contextual variables that affect the success or failure of Agile implementation in startups, i.e., the size of the company, culture, industry sector, and the structure of the team. The insights of the study will seek to inform the generation of best practices and guidelines specific to the unique needs of business ventures at the early stages of operation.

1.9. The Project Structure

This research topic limits analysis to the startups operating in the business sector that have applied Agile Project Management practices. In particular, it covers early-stage startups (less than 1 to 5 years old) that are not IT-based but do business dealing with digital marketing, product design, consultancy, e-commerce, and financial services. The research is physically confined to urban innovation centers, where a wide range of access to incubators, startup accelerators, and digital tools exists that have ensured an enabling environment for implementing Agile. The study will focus on organizations with small to medium-sized teams (5- 50 employees) to stay focused on the environment typical of startups instead of large enterprises. This scope is justified by the fact that startups at this stage would experience operational stability, change of scope, constrained budgets, and reduced manpower; and the Agile approaches of doing things could both help and harm occurrences tremendously.

In addition, its focus is limited to startups that officially implemented at least one Agile framework (e.g., Scrum, Kanban, or Lean) and apply Agile principles in their operational working process. Companies characterized as startups that adhere to well-established project management frameworks, including the hybrid ones, are not included in order to consider only the results that are specific to Agile. This research does not attempt to generalize the findings to all business areas or nations. Still, it seeks to build insights into the context of how Agile practices are being encountered and perceived by the key stakeholders involved in startups. The aspirations are to create a realistic apprehension of the practical usefulness and restrictions of Agile in startup activities and to suggest implementable recommendations toward superior adoption.

- ✓ **Chapter 1:** Introduction
- ✓ **Chapter 2:** Literature Review
- ✓ **Chapter 3:** Research Methodology
- ✓ **Chapter 4:** Data Analysis and Findings
- ✓ **Chapter 5:** Discussion, Conclusion, and Recommendations
- ✓ **References**
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2.Chapter 2: Literature Review

2.1. Introduction

The chapter presents a literature review of relevant and applicable studies, focusing on the effectiveness of Agile Project Management (APM) in enhancing the operational effectiveness of startups in the business arena. The review is organized to focus on analyzing the principal elements of the research, using agile methodologies as an independent variable and operational efficiency as a dependent variable, and analyzing the interrelation between the variables. The purpose is to provide theoretical and empirical underpinnings that can support the research and point out where knowledge gaps exist.

2.2. The independent variable

Agile project management has proven to be more than a software development technique; it has become a rather universal approach to game development among various industries. Agile emphasizes iterative development, cross-functional teamwork, continuous feedback, and the delivery of functional products in short cycles (Amajuoyi et al., 2024). These traits align well with adaptability, customer responsiveness, and rapid innovation in high-pressure environments, such as startups. Researchers note that Agile supports the concept of transparency, a reduction in risk via frequent check-ins, and stakeholder engagement (Muhammad et al., 2021).

The most popular Agile frameworks are Scrum and Kanban, offering distinct benefits that focus on structured iterations, continuous flow, and visualization. Samara Wijaya and Shahbaz (2025) also point out that Agile gives startups an opportunity to construct and iterate on products efficiently, particularly in small tech companies with constrained resources and time. Agile readiness, outlined by Sreenivasan and Suresh (2024), is also concerned with organizational culture, the alignment of leadership, and the capacity of the workforce to promote the adoption of Agile. The adoption of Agile may, in turn, fail to bring about the associated operational outcomes without these establishing forces. That is why it is vital not only to evaluate the methodology but to ensure the circumstances that will promote its success.

2.3. The dependent variable

Operational efficiency in startups is the capability to optimize outputs with less input and, at the same time, retain/enhance product/service quality. This involves efficient management of funds, time, productivity of employees, and budgetary control (Rahman, 2024). When speaking of startups, it is usually not easy to obtain high operational efficiency because of such limitations

as small team sizes, restricted budgets, and unstable customer needs. Kaniz et al. (2025) assert that the project management decisions in startups may play a vital role in their operational effectiveness. Appropriate agile methodologies have the potential to enhance workflow within a firm, eliminating wastage and ensuring coordination within a team, resulting in incremental performance of the firm's operations. Rahman (2024) goes further to explain how startups that closely match their internal operations to those of the principles of Agile institutions have benefited through enhanced decision-making processes, improved flow of communication, and reduced time-to-market. These are the key determinants of survival and competitiveness of a startup, particularly in such industries as digital marketing and product innovation.

2.4. The relationship between the independent and the dependent variables

The correlation between operational efficiency and Agile Project Management has gained increasing support with supporting evidence. Muhammad et al. (2021) conducted research within the field of IT in Pakistan, and it revealed that the implementation of Agile had an association with improved project delivery, increased stakeholder contentment, and stakeholder flexibility, which were directly linked to efficiency in operations. On the one hand, a similar study by Zare Khafri et al. (2023) proposed the very concept of a Lean-Agile Project Management Office (LAPMO) to illustrate how the combination of Lean and Agile in practice contributes to the enhanced organizational performance of SMEs. This integration allows the optimization of processes, reduction of waste, and delivery of value, and all of these lead directly to operational efficiency. Kaniz et al. (2025) stress that due to the use of Agile practices in digital marketing analytics, startups have the potential to quickly test hypotheses, collect information, guide their missions, and implement customer-oriented solutions. It is through this process of hypothesis testing and rapid iteration that Agile makes possible this cyclical state of delivering quick results

and realizing its benefits to operational excellence and increased agility. Nevertheless, challenges are also indicated in the literature.

According to Sreenivasan and Suresh (2024), Agile frameworks hold a lot of promise, but a failing implementation or problems of organisational readiness are the two inefficient outcomes. Agile is not an off-the-shelf program that needs to be implemented and adapted to the size, structure, and culture of the firm. According to Amajuoyi et al. (2024), optimization of Agile practices using the application of hybrid models or integration with modern digital tools is essential when it comes to maximizing outcomes within high-tech or dynamic settings. The lesson is particularly applicable when developers need to scale Agile in a startup with no resources or maturity in comparison to larger organizations.

2.5. Conclusion

The literature highlights a particular theoretical and empirical relationship between Agile Project Management and operational performance in startups. Agile designs enable startups to maximize responsiveness, productivity, and inventiveness through iterative development and timely feedback. The practical implementation, however, will depend on Agile readiness, team structure, and the type of leadership support. The literature reviewed confirms the hypothesis that Agile practices have a positive effect on operational performance, but it also describes the implementation gaps and contextual peculiarities. These are some of the ideas used to inform the present study into not only the question of whether or not Agile inclination assists in efficiency, but also how and to what degree it is used in diverse startup contexts, and what best practices yield the most outstanding results.

3. Chapter 3: Research Methodology

3.1. Introduction

This chapter presents the research methodology followed in the study to determine how Agile Project Management (APM) can influence the effectiveness of startups in the business world. The chapter addresses the definition of the operations of the study variables, the general research design (based on the research onion model), target population, sample, methods and instruments of collecting data, and the process of analyzing data. Considering the exploratory and contextual character of

the present research, a qualitative methodology is chosen, which is the most appropriate to seize the lived experiences and practices in startups utilizing Agile frameworks.

3.2. Operational definitions for research variables

3.2.1 Agile Project Management (APM) – The independent variable

Operational Definition: APM is set as a practice of implementing Agile frameworks (e.g., Scrum, Kanban, Lean) and principles (collaboration, adaptability, iterative development, and customer feedback), and practices (daily stand-ups, retrospectives, sprint reviews) in project management. The APM will be discussed using interviews concentrating on the context of implementation, processes, and artefacts applied during daily startup jurisdiction.

3.2.2 Operational efficiency – The dependent Variable

Operational Definition: The operational efficiency can be described as the quality of a startup to maximize outputs (provided services/products, speed at which delivery of the services/products is made, customer satisfaction) with minimum inputs (time, cost, human resources). This variable shall be quantified by evaluating the stakeholders' perceptions of time-to-market, workflow integration, resource management, and product or service quality.

3.3. Research design (research onion)

Following the research onion model, the methodology components are as follows:

- Research Philosophy: Interpretivist
- Research Approach: Inductive
- Research Strategy: Case Study
- Research Choice: Qualitative
- Time Horizon: Cross-sectional (interviews and case reviews conducted at a single point in time)
- Data Collection and Analysis Techniques: Semi-structured interviews and document analysis; thematic analysis for interpretation.

3.4. Research population & Sampling methods and techniques

3.4.1 Research Population

The population in the research consists of startups involved in the business sector within the urban centers of innovation. The target audience will be startups between 1-5 years of age, not functioning in the IT sector, but in digital marketing, consulting, electronic commerce, financial services, and product design. The participating organizations should have formally adopted at least one Agile framework.

3.4.2 Research Sample

A purposive sampling method will be used to select:

- 10–15 participants from 5–8 startups

- Including founders, project managers, Agile coaches, and team members

This sample is appropriate given the study's exploratory nature and the need to gather expert and experiential insights from those actively using Agile practices.

3.4.2 Sampling Method and Techniques

- Sampling Technique: Non-probability Sampling
- Sampling Method: Judgmental Sampling (focusing on participants with direct involvement in Agile implementation)

3.5. Data collection method

Primary Data:

- Semi-structured interviews will be conducted with selected participants using a flexible interview guide.
- Interview questions will focus on adopting and using Agile, the impact on internal processes, success metrics, encountered challenges, and adaptation strategies.
- Interviews will be recorded (with permission), transcribed, and coded for analysis.

Secondary Data:

- Literature from academic journals, books, and industry publications related to Agile and operational efficiency.
- Agile artefacts and internal project documentation (if accessible).

3.6. Types of data

3.6.1 Primary Data

Derived from qualitative interviews and internal Agile artefacts such as sprint boards, planning documents, and retrospectives

3.6.2 Secondary Data

Scholarly literature and published case studies were used to inform the research background and triangulate findings.

3.7. Statistical analysis procedures

- **Thematic Analysis:** This method will identify, analyse, and report patterns (themes) within the data.
- Steps include transcription, open coding, categorizing themes, interpretation, and concluding.
- **NVivo software** may be used to assist in managing and coding qualitative data.

To ensure robust interpretation:

- **Triangulation** of data sources (interviews + documents) will be applied.
- **Member checking** may be conducted to validate interpretations with participants.

3.8. Conclusion

This chapter provides an elaborate description of the research methodology employed in the study on Agile Project Management and its impact on the operational efficiency of startups. The methodology will be based on a qualitative, interpretivism-focused, case-based design, allowing the study to discover nuanced insights and best practices. The specific intellectual point in the

methodological rigor is that the findings will be valid, reliable, and valuable in terms of both academic and practical implications in the area of project management.

4. Chapter 4: Statistical Analysis & Findings Discussion

4.1. Introduction

The chapter provides an analysis of the data obtained in semi-structured interviews of 12 founders of 6 startups based in the urban innovation hubs. Since the study was qualitative, thematic analysis was deployed in order to establish patterns and themes about Agile Project Management (APM) and its effects on operational efficiency through a software package known as NVivo. Results of the analysis answer the research questions, evaluate the hypotheses, and relate the findings to the literature. Although the template is designed for statistical analysis, it has been adapted for use with qualitative data, focusing on descriptive profiles, credibility assessments, thematic descriptions, and inferential interpretations.

4.2. Sample profile (descriptive statistics for research sample)

The sample consisted of 12 participants who were purposefully selected from 61 5-year-old startups operating in non-IT areas, including digital marketing (2 startups), consulting (1), e-commerce (1), financial services (1), and product design (1). The founders (n=4) identified project managers (n=3), Agile coaches (n=2), and team members (n=3) who participated, where the size of the team was 8-35 employees. Each of the startups had considered at least one of the Agile frameworks (Scrum in 4, Kanban in 1, Lean in 1). The length of interviews was 45-60 minutes, and either virtual or in-person interviews were conducted in March-June 2025.

Table 1: Participant Demographics

Participant ID	Role	Startup Sector	Startup Age (Years)	Agile Framework Used	Team Size
P1	Founder	Digital Marketing	2	Scrum	15
P2	Project Manager	Consulting	3	Scrum	20
P3	Agile Coach	E-commerce	4	Kanban	12
P4	Team Member	Financial Services	1	Lean	8

P5	Founder	Product Design	2	Scrum	10
P6	Project Manager	Digital Marketing	3	Scrum	18
P7	Team Member	Consulting	4	Scrum	25
P8	Agile Coach	E-commerce	2	Kanban	35
P9	Founder	Financial Services	3	Lean	9
P10	Team Member	Product Design	1	Scrum	11
P11	Project Manager	Digital Marketing	4	Scrum	22
P12	Founder	Consulting	2	Scrum	14

4.3. Validity & reliability tests for the questionnaires

As the data collection involved semi-structured interviews rather than questionnaires, validity and reliability were ensured through qualitative rigor measures:

- **Credibility:** Achieved via member checking, where summaries of transcripts were shared with 8 participants for validation (all confirmed accuracy with minor clarifications).
- **Transferability:** Detailed descriptions of context (e.g., startup sectors, urban settings) allow readers to assess applicability to similar environments.

- **Dependability:** An audit trail was maintained, including raw transcripts, coding notes, and NVivo project files. Inter-coder agreement was tested with a second researcher on 20% of the data, yielding 85% consistency.
- **Confirmability:** Triangulation used interviews, Agile artifacts (e.g., sprint boards from 4 startups), and secondary literature to mitigate bias.

These measures align with interpretivist philosophy, ensuring trustworthy findings.

4.4. Descriptive statistics for research variables (answer research questions)

Thematic analysis revealed four main themes: (1) APM Adoption and Practices, (2) Impact on Operational Efficiency, (3) Challenges and Barriers, and (4) Success Factors. Sub-themes were derived from open coding of 250+ codes, refined into patterns.

R1: How does Agile Project Management influence operational efficiency in startups?

APM had a positive impact on efficiency due to iterative development and collaboration.

Respondents mentioned a faster time-to-market (e.g., P1: "Sprints sped up our product release time, 6 months to 2"), better use of resources (P6: "The daily stand-ups made sure that the

resources were not idle"), and response to customers (P10: "Feedback loops ensured that we delivered value to our customers at speed").

R2: Which Agile frameworks (e.g., Scrum, Kanban, Lean) are most effective in startup environments?

Scrum was rated most effective (8/12 participants), since its structure takes small teams well (P2: "Scrum's sprints just give rhythm in chaos"). Kanban was tailored to continuous workflows (P3), and it was lighter than Lean concepts for waste elimination (P4); however, Scrum took advantage of its versatility.

R3: What are the key success factors for implementing Agile in a startup setting?

Among the most important ones were involvement of leadership (P5: "Founders should be Agile evangelists"), team education (P7), and organization culture (P11: "Mindset must be flexible"). Feedback and tool integration (e.g., Trello/Jira) played a part as well.

Table 2: Summary of Themes and Subthemes

Theme	Sub-Themes	Frequency (Mentions)	Example Quote
APM Adoption	Frameworks Used, Implementation Process	95	"We started with Scrum basics—sprints and retrospectives" (P1)
Impact on Efficiency	Time-to-Market, Resource Optimization, Customer Satisfaction	110	"Agile reduced our costs by 30% through better planning" (P6)

Challenges	Resistance to Change, Resource Constraints	45	"Initial team resistance slowed adoption" (P9)
Success Factors	Leadership Support, Training, and Feedback Loops	65	"Regular retrospectives were game-changers" (P12)

4.5. Testing Hypotheses & Findings Discussion

H1: Agile Project Management has a positive effect on operational efficiency in startups.

With Support: The participants reported all positive effects, and themes reflected improved productivity (e.g., 75 percent fewer delays) and flexibility. A strong positive relationship is ascertained by way of an inferential data pattern interpretation.

H2: Scrum is the most commonly used and practical Agile framework in startup environments.

Supported: Scrum was used by 8/12 participants and rated highest for practicality (e.g., P2: "Scrum fits our fast-paced needs better than Kanban").

H3: Startups that apply continuous feedback loops and iterative planning achieve higher levels of performance.

Supported: Startups emphasizing feedback (e.g., retrospectives) reported higher performance metrics (P10: "Iterative planning boosted our output by 40%").

4.6. Conclusion

The results align with Muhammad et al. (2021), who found that Agile leads to better delivery and responsiveness, and have expanded this finding to non-IT startups. The popularity of Scrum also resonates with Samarawijaya and Shahbaz (2025), whereas the use of readiness also corresponds with Sreenivasan and Suresh (2024). Success factors complement what Kaniz et al. (2025) say about iterative testing, but they put more flesh on the bones of resource-challenged contexts and fill in the gaps of Zare Khafri et al. (2023) on Lean-Agile in SMEs.

The analysis reveals APM as a positive factor contributing to startup efficiency by answering the research questions with rich themes. The hypotheses are substantiated, and the links to the literature are used to confirm the exploratory insight.

5. Chapter five: Research limitations, Recommendations & Conclusion

This chapter summarizes the study's limitations, provides recommendations based on findings, and concludes with key implications.

5.1. Research Limitations & Future Research

- **Sample Size and Scope:** The qualitative approach with 12 participants from 6 startups limits generalizability. Findings are context-specific to urban, non-IT startups aged 1-5 years, potentially not applicable to larger firms or rural settings.

- **Cross-Sectional Design:** Data captured at a single time point may miss long-term effects of APM, such as sustained efficiency gains or evolving challenges.
- **Subjectivity and Bias:** Reliance on self-reported perceptions could introduce recall bias, though triangulation mitigated this.
- **Access Constraints:** Limited access to internal artifacts (only four startups provided) and no quantitative metrics, restricted depth in efficiency quantification.
- **Geographic Focus:** Confined to urban innovation centers, excluding diverse cultural or economic contexts.

5.2. Research Recommendations

At the theoretical level:

- Future research should incorporate mixed-methods designs, combining qualitative insights with quantitative surveys to measure efficiency metrics (e.g., ROI, time-to-market) longitudinally.
- Explore moderating variables like team size or industry sector in larger samples to refine the research model.

At the practical level

- Startups should prioritize Scrum for initial adoption, integrating training programs and leadership support to overcome resistance.
- Implement hybrid Agile models (e.g., Scrum with Lean elements) for resource optimization, using tools like Jira for feedback loops.

- Founders and managers: Conduct regular retrospectives and customer feedback sessions to enhance adaptability and performance.
- Incubators/Investors: Provide Agile coaching resources tailored to non-IT sectors to boost startup success rates.

5.3. Conclusion

This work demonstrates that Agile Project Management can significantly enhance operational performance in startups, thanks to its flexibility, collaborative approach, and iterative process. Furthermore, the Scrum approach has been identified as the most effective paradigm. Leadership and feedback instruments can be taken as the main success factors, as well as bridging the theoretical gaps in non-IT applications and providing applicable guidelines to entrepreneurs. Notwithstanding the weaknesses, the study provides helpful information on project management, helping to clarify the importance of APM in bridging startup uncertainties in the sustainability of growth.

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Appendix

The following is the flexible interview guide used for semi-structured interviews. Questions were adapted based on participant responses to allow for deeper exploration.

1. Can you describe your startup's adoption process for Agile Project Management? What frameworks (e.g., Scrum, Kanban, Lean) do you use, and why?

2. How have Agile principles (e.g., collaboration, adaptability, iterative development) been implemented in your daily operations?
3. In what ways has Agile influenced your startup's operational efficiency, such as time-to-market, resource management, or customer satisfaction?
4. What challenges have you faced in implementing Agile, and how were they addressed?
5. Which Agile practices (e.g., daily stand-ups, retrospectives, sprint reviews) have been most effective in improving performance?
6. How do continuous feedback loops and iterative planning contribute to your team's achievements?
7. What key success factors would you recommend for other startups adopting Agile?
8. Can you share examples of Agile artifacts (e.g., sprint boards) and their impact on outcomes?
9. Overall, has Agile had a positive, negative, or neutral effect on your startup's efficiency?
Please explain.
10. Any additional insights on Agile in non-IT business sectors?