



Exploring the Challenges Sri Lankan Software Start-ups Face When Adopting Agile Methodologies

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ABSTRACT

Project management is essential for success in dynamic sectors such as software development. This research investigates the adoption of Agile project management techniques (PMMs) by Sri Lankan software start-ups, with an emphasis on identifying major contributing variables, analysing implementation obstacles, and recommending improvement solutions. Data was acquired using a multiple case study technique, with seven senior executives from various businesses participating in semi-structured interviews. Key elements identified through thematic analysis were team communication, market needs, consumer expectations, industry standards, and external pressures. The highlighted challenges include resource limits, cultural and organisational opposition, strict industrial standards, and uncertainty during Agile deployment. The research suggests practical answers such as obtaining external guidance, striking a balance between stability and flexibility, dealing with cultural opposition, and maximising resource allocation. These results are useful for start-ups looking to improve project management methods, as well as politicians looking to encourage innovation in the software industry. This study fills a significant gap in the project management literature by investigating Agile PMM adoption in Sri Lanka's distinct socio-cultural and economic settings. The insights provided are critical for implementing good project management methods, increasing agility, and gaining long-term competitive advantages.

Keywords: Agile Project Management, Case Study, Project Management, Qualitative Research, Sri Lankan Software Start-ups

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INTRODUCTION

This study fills a significant gap in knowing how Agile project management approaches are embraced and applied by Sri Lankan software start-ups. While Agile approaches have acquired global recognition for their potential to improve flexibility and efficiency in software development, little study has been conducted to investigate their applicability in the socioeconomic and operational settings of Sri Lankan start-ups. The primary research problem lies in the lack of empirical insights into the challenges, barriers, and opportunities these start-ups encounter when adopting Agile methodologies, coupled with an underexplored relationship between Agile practices and innovation within this ecosystem.

The objectives of this study are as follows:

To determine the main elements impacting Sri Lankan software start-ups' adoption of the Agile approach.

To examine the difficulties and impediments that these start-ups have while putting Agile principles into reality.

To create plans and suggestions for resolving these issues and improving the successful incorporation of Agile approaches into their business processes. There is a knowledge gap regarding the complex dynamics of smaller, resource-constrained contexts, such as Sri Lankan start-ups, as most existing research concentrates on worldwide Agile adoption trends and the difficulties faced by larger organisations (Fernando & Kapurubandara, 2015). Due to their set of limitations—such as difficult access to capital, fierce rivalry, and changing customer needs—these start-ups require a special analysis of Agile methodologies.

This study examines how Agile approaches affect project management results, innovation, and operational efficiency in Sri Lankan start-ups using a multiple case study methodology. In addition to providing insights into the organisational and systemic elements influencing Agile adoption, the study examines best practices and constraints. For instance, despite Agile's widespread recognition for improving adaptability and

teamwork, incorporating it into Sri Lankan start-up operations frequently encounters opposition because of structural and cultural barriers (Tripp & Armstrong, 2014). Both academia and practice benefit from the study's conclusions. By providing a thorough examination of Agile project management in the Sri Lankan context, the study enhances the body of academic literature. In practice, it offers doable suggestions for entrepreneurs, legislators, and industry participants to create an atmosphere that is favourable to the adoption of Agile.

This research is guided by the following research questions:

RQ1: What are the main determinants of Sri Lankan software start-ups' adoption of Agile methodologies?

RQ2: What major obstacles and difficulties do these organisations encounter while using Agile methodologies?

RQ3: To maximise the adoption of Agile, how can these obstacles and problems be effectively addressed? By addressing these questions, the study seeks to bridge the knowledge gap and enhance the operational and strategic capabilities of Sri Lankan software start-ups. It further aims to support ecosystem development by fostering a deeper integration of Agile practices with software development processes.

LITERATURE REVIEW

Impact of Agile Project Management on Start-ups

Agile project management methods significantly impact start-ups, providing faster time-to-market, higher customer satisfaction, and increased team communication. They can also help companies adapt to changing market conditions and consumer needs, producing more successful end-product results (Fernando & Kapurubandara, 2015).

Using the work of Ambler and Lines (2012), who describe the benefits of agile techniques, more research is needed to find the specific benefits and drawbacks unique to the Sri Lankan software start-up context. Evaluating

project success elements: Identify the success factors that are particularly essential in adopting and implementing agile project management methodologies in Sri Lankan software start-ups. Consider project completion time, adaptability to changing demands, team communication and collaboration, and stakeholder engagement. Investigate how these factors impact overall project performance in a start-up context. However, Agile approaches have potential downsides, such as decreased documentation and quality control, which may result in lower-quality products.

This literature review addresses the gap by investigating the adoption and effectiveness of Agile project management methods within Sri Lankan software start-ups. Research on the influence of Agile methodologies on project participants (Chen et al., 2009), the development process, and the project provides valuable insights into the broad impact of Agile methodologies on software project management. However, it needs to address the unique context of Sri Lankan software entrepreneurs. To overcome this gap, a focused analysis is required to examine the adoption and implementation of Agile techniques among Sri Lankan software start-ups. Some studies investigate the relationship between organisational adoption motives and the tailoring of agile practices within organisations (Tripp & Armstrong, 2014). It also explores how agile principles affect project success, team dynamics, product quality, customer satisfaction, and organisational performance in Sri Lanka. The study also considers the local business environment, cultural features, government legislation, and market conditions that may influence the adoption and effect (Rogers et al., 2014) of agile project management approaches in Sri Lankan software companies. The benefits and results of agile project management practices in Sri Lankan software companies, assessing project success rates, delivery speed, change responsiveness, customer happiness, and

software quality. The article (Tripp & Armstrong, 2014) provides a comprehensive understanding of developing and adopting project management methodologies in the software industry.

The article by Bryson (1993) investigates the critical factors influencing the planning and implementation of significant projects. The research investigates contextual elements, project planning, and implementation procedures influencing project success. It seeks to comprehend how context and method impact the results of significant initiatives. The article by Yang et al. (2009) focuses on the problems of managing Enterprise Resource Planning implementation projects and how project management methods might enhance the odds of success. Although ERP installation and software development projects have certain parallels, they have different features and considerations.

Coram and Bohner (2005) performed research on the influence of Agile methodologies on project participants, the development process, and the project. While this study gives valuable insights into the broad impact of Agile methodologies on software project management, it needs to address the issues, opportunities, and context encountered by Sri Lankan software entrepreneurs. As a result, a focused analysis is necessary to examine the utilisation and efficacy of Agile project management methodologies in Sri Lankan software start-ups. Highsmith (2001) found that while agile principles are iterative and collaborative, there needs to be more clarity in knowing how these principles directly affect success metrics and team dynamics in the context of Sri Lankan software companies. Examine the benefits and drawbacks of using agile project management approaches in Sri Lankan software start-ups. Orla and Mairéad (2011) investigate why organisations in Ireland transition to an internationally recognised project management methodology and why organisations without one implement one.

The research focuses on the reasons for using a globally renowned approach and the benefits and problems that come with it in an Irish setting. Further research is required to analyse how agile concepts and techniques, such as Scrum, Kanban, and iterative development, specifically influence project results, team dynamics, and customer satisfaction in the unique environment of Sri Lankan software start-ups.

The article by Mohammed and Abushama (2013) analyses and compares prominent agile software development approaches. The study analyses software Small & Medium Enterprises' difficulties and develops criteria for comparing various solutions. It seeks to show the parallels and contrasts between the methodologies examined. However, the article needs to mention the unique effects and consequences of utilising agile project management approaches in the context of Sri Lankan software businesses. The paper's findings and suggestions differ from the difficulties and possibilities confronting software companies in Sri Lanka. To fill this need, the research should investigate the impact of agile project management methodologies on Sri Lankan software start-ups. Should investigate how adopting and using agile concepts and methods affects the planning and implementation of software projects in the context of Sri Lankan start-ups. Jain and Nair (2015) compare existing process models, their benefits, and their drawbacks in the context of small-scale mobile-centric tech firms in India. While the article investigates the adoption of agile concepts and practices in tech start-ups, it needs to explore the impact of utilising agile project management methodologies in Sri Lankan software companies. The findings and insights from the research are based on the setting of Indian tech companies, which may have distinct features, problems, and market dynamics from Sri Lankan software firms. Therefore, the research should focus on the Sri Lankan environment to explore the impact of agile project management approaches in

Sri Lankan software companies. Gather data and insights on the specific benefits, challenges, and outcomes associated with adopting and implementing agile project management methods in Sri Lankan software start-ups by conducting empirical research within the context of Sri Lanka, such as surveys, interviews, or case studies. Investigate how agile approaches affect many elements of Sri Lankan software companies, such as project success, team cooperation, product quality, customer happiness, and overall organisational performance. Examine the unique hurdles, facilitators, and contextual factors that impact agile project management approach adoption and success in Sri Lankan software start-ups. By concentrating on the Sri Lankan environment, consider the distinctive qualities, cultural aspects, market circumstances, legal frameworks, and obstacles relevant to Sri Lankan software companies. This will allow us to give insights, and advice customised to the Sri Lankan environment, assisting Sri Lankan software start-ups in making educated decisions about adopting and implementing agile project management approaches. Mahanti (2016) examines the primary problems that organisations experience while implementing agile principles. It explores themes such as frameworks for agile organisational transformation and adoption techniques using information from the literature. While the study discusses the issues organisations encounter when adopting agile methodologies, it needs to particularly examine the impact of implementing agile project management methods in Sri Lankan software start-ups.

The research should focus on start-ups rather than more prominent organisations to explicitly explore the effect of implementing agile project management approaches in Sri Lankan software start-ups. It can be investigated how the use of agile methodologies affects many elements of Sri Lankan software start-ups, such as project success, team dynamics, productivity,

innovation, customer happiness, and overall business performance, by concentrating on start-ups. Considering the distinct characteristics of Sri Lankan software start-ups, such as size, resource constraints, cultural factors, market conditions, and regulatory frameworks, this study provides valuable recommendations and guidelines for these start-ups to adopt and leverage agile project management methods effectively. The study can contribute to current knowledge and give actionable insights for Sri Lankan start-ups by exploring the problems Sri Lankan software companies face in adopting agile methodologies and identifying successful practices and tactics. The article (Vithana et al., 2016) examines success factors for agile software development projects in Sri Lanka. However, it does not explicitly address the application and impact of agile project management methods in the context of software start-ups. Furthermore, the study focuses on software companies in Sri Lanka, recognising the problems and dynamics they encounter. Furthermore, the indicated work investigates agile software development initiatives in general, which may involve firms other than start-ups. Finally, the study subject is to thoroughly investigate the impact of implementing agile project management approaches in Sri Lankan software companies, covering diverse results, problems, and benefits unique to this environment. The preceding work focuses primarily on success variables that contribute to the efficacy of agile software development projects without thoroughly investigating their influence on software start-ups. As a result, the literature gap stems from the need to examine the impact of adopting agile project management approaches in Sri Lankan software start-ups and investigate the unique difficulties, advantages, and results connected with their adoption in this specific environment. Empirical research conducted inside Sri Lankan software companies would assist in addressing this gap and give significant insights into the success of agile initiatives in software start-ups. Wells et al.

(2015) provide valuable insights into the differences in the ability of business lines, specifically product development and software development functions, to follow agile guidelines within a sizeable technology-focused organisation. This study, however, focuses on a standard project setting and may not directly address the characteristics, resources, and issues that software companies in Sri Lanka confront. The research gap is caused by the need for more studies that mainly explore the impact of agile project management methodologies in the context of Sri Lankan software companies.

While current studies provide insights into agile adoption in various organisational contexts, more research is needed to focus on the unique problems Sri Lankan software start-ups confront while adopting and implementing agile principles. Furthermore, analysing the efficacy of agile methodologies in improving project outcomes and success metrics in the start-up setting is critical for assessing the value proposition of agile project management in this context. Furthermore, cultural and organisational issues have an essential influence on adopting and implementing agile approaches. Therefore, to understand the socio-cultural dynamics at work, it is necessary to investigate the cultural and organisational aspects impacting the adoption of agile methods in Sri Lankan start-ups. In addition, researching the tactics and approaches Sri Lankan software entrepreneurs use to overcome hurdles and capitalise on the benefits of agile project management will give practical insights for start-ups working in comparable circumstances. To address the literature gap, it is crucial to explore the adoption and implementation of Agile techniques in Sri Lankan software start-ups. This investigation will shed light on the factors influencing the choice of Agile methodologies, the challenges encountered during implementation, and the strategies employed for effective execution, providing valuable insights into the distinctive context

of these companies. Examining challenges in implementing Agile methods will reveal unique obstacles, enabling proactive risk mitigation by project managers and stakeholders and ensuring a smoother transition. Furthermore, assessing the impact of Agile practices on project outcomes is essential for evaluating their effectiveness in enhancing project delivery, customer satisfaction, product quality, and overall success metrics, demonstrating Agile's value to Sri Lankan software start-ups.

Agile project management methodologies have emerged as game-changing tools for start-ups, encouraging adaptability, increasing customer happiness, and improving team cooperation. These approaches allow businesses to respond effectively to changing market conditions, reducing time-to-market and achieving better product outputs (Fernando & Kapurubandara, 2015). Despite their widespread use, the precise implications of Agile techniques for Sri Lankan software start-ups remain unknown. This study seeks to close that gap by investigating how Agile adoption affects project success and overall organisational performance in this setting.

Key Contributions of Agile in Start-ups
Agile principles encourage iterative development, stakeholder interaction, and flexibility, all of which contribute to better project outcomes. Benefits include:

- Complete the project faster.
 - Increased adaptability to changing needs.
 - Enhanced team communication and collaboration.
- However, Agile approaches have drawbacks, such as little documentation and potential quality control difficulties, which are especially important in resource constrained contexts like Sri Lankan start-ups. Existing research focuses primarily on large organisations or certain global situations, leaving a huge gap in understanding Agile's nuanced implementation in developing countries.

For example:

- Tripp and Armstrong (2014) investigated Agile adoption inside established businesses but lacked insight into the dynamics of start-ups.
- Rogers et al. (2014) investigated the impact of Agile on organisational performance but did not take into consideration cultural and regulatory differences in Sri Lanka.
- Mohammed and Abushama (2013) compared Agile frameworks but did not address the difficulties specific to the Sri Lankan software industry.

This study investigates the impact of Agile on project success variables like delivery speed, adaptability, and team cohesion in Sri Lankan start-ups, using empirical studies such as surveys and interviews to derive conclusions.

The Use of Institutional Theory, Resource Dependency Theory, and Diffusion of Innovation Theory in the Context of Agile Project Management Theory Adoption

Some research investigated the influence of institutional pressure on adopting Agile in Chinese software firms (Chen et al., 2009). They discovered that coercive and normative pressure were essential motivators for Agile adoption. Some researchers investigated the role of outside resources in adopting Agile in Chinese software firms (Chen et al., 2009). External resources, such as access to training and assistance, were discovered to be critical for effective Agile implementation. In the diffusion of innovation theory (Rogers et al., 2014), Rogers explains how inventions are embraced and disseminated across time. The method highlights five major characteristics influencing innovation adoption: relative benefit, compatibility, complexity, trial ability, and observability (Dingsøyr et al., 2018). According to Yin (2009) the diffusion of innovation theory was used to investigate adopting Agile techniques in software organisations. They discovered that relative benefit, compatibility, and complexity were

essential for adopting Agile. Dingsøyr et al. (2018) examined the adoption of Agile techniques in Norwegian software businesses using the diffusion of innovation theory. They discovered that relative advantage, compatibility, complexity, trial ability, and observability were all crucial determinants in Agile adoption. Exploring small-scale start-ups in the Sri Lankan context is essential to address the literature gap.

This study uses Institutional Theory,

Resource Dependency Theory, and

Diffusion of Innovation Theory to examine Agile adoption and implementation in Sri Lankan software start-ups.

According to Scott (2013), organisational practices are often shaped by institutional forces, such as legal mandates and industry standards. In Sri Lanka, coercive demands from stakeholders and normative forces, such as peer competitiveness, are critical in pushing Agile adoption. According to Nadarajah (2018), successful Agile implementation requires access to crucial resources like training, tools, and expert assistance. Sri Lankan start-ups, frequently with minimal resources, face specific obstacles in efficiently implementing Agile practices.

The Diffusion of Innovation Theory proposes five essential properties that drive innovation adoption: relative advantage, compatibility, complexity, trial ability, and observability (Rogers et al., 2014). Agile's perceived benefits, such as speedier delivery and more customer satisfaction, are key to its adoption among start-ups in Sri Lanka.

The existing literature provides great insights into Agile project management, but it mostly focuses on contexts that are very different from Sri Lankan software start-ups. Key gaps include:

- Lack of focus on start-ups: Most studies look at Agile in large businesses or generic software development contexts,

but they do not address the unique dynamics of start-ups.

- Contextual differences: Cultural, market, and legislative considerations specific to Sri Lanka are sometimes disregarded.
- Empirical research is scarce: Few studies study Agile techniques using primary data collection in Sri Lankan start-ups.

This study fills those gaps by:

- Examining Agile adoption and effectiveness in Sri Lankan software start-ups.
- Investigating specific problems, such as limited resources and socio-cultural issues, that influence Agile deployment.
- Assessing Agile's impact on key success measures such as project delivery, team cooperation, and customer satisfaction.

Agile project management has considerable potential to improve the performance of Sri Lankan software start-ups. However, its successful implementation necessitates careful consideration of contextual factors such as resource restrictions and cultural differences. By combining theoretical frameworks and undertaking empirical research, this study offers actionable insights into Agile's role in promoting innovation, enhancing project results, and driving corporate success in this expanding industry. Future research should concentrate on practical techniques for overcoming hurdles to Agile adoption and harnessing its benefits to obtain competitive advantages in resource-constrained settings.

RESEARCH METHODOLOGY

The research methods used in this study focus on social constructivism, inductive reasoning, and qualitative research. Qualitative research is a study technique that attempts to comprehend and interpret people's experiences, attitudes, and behaviour in their natural environments. It is a methodical research strategy that depends on non-numerical data such as interviews, observations, and written or visual materials to provide a comprehensive knowledge of the research subject. Qualitative research allows

for a thorough examination of the environment in which Agile approaches are used. According to Creswell (2013), qualitative research is most useful when the objective is to comprehend the complexities of phenomena in their natural environment. Researchers do not draw satisfactory findings, establish theories, or argue that their work is generalisable without the approval of independent observers capable of duplicating analysis techniques or abilities utilising test tools and processes that provide reliable measurements. To ensure the rigour and reliability of the research findings, the researcher assembled the data using criteria and did a logical assessment during the case study research design, data collection, and data analysis. The multiple case study method, described by Yin (2009), was used. This method is particularly useful for investigating complicated processes in real-world settings.

The multiple case study approach is warranted because Cross-case comparison allows for analytical rather than statistical generalisation of findings (Gibbert et al., 2008). It is consistent with the study's goal of investigating diverse start-ups functioning in a variety of environments to gain a better understanding of Agile adoption. Social constructivism emphasises that knowledge is formed through social interactions and is influenced by cultural, historical, and linguistic variables (Fernando & Kapurubandara, 2015).

Incorporating social constructivism into this research can help understand the impact of agile project management methodologies on Sri Lankan software start-ups by considering the social and cultural factors influencing their adoption, implementation, and outcomes (Safwan et al., 2013). Inductive reasoning is used in this study to gain a thorough understanding of the unique environment and intricacies of Sri Lankan software companies (Pradeep, 2019). It allows for exploring the complexity and difficulties of implementing agile approaches and their influence on start-up performance (Pradeep, 2019). Inductive reasoning also offers flexibility and adaptation in the research process, allowing for fine-tuning of research questions,

hypotheses, or ideas in response to developing patterns and unexpected results.

Qualitative research is a study technique that attempts to comprehend and interpret people's experiences, attitudes, and behaviour in their natural environments. It relies on non-numerical data such as interviews, observations, and written or visual materials to provide a comprehensive knowledge of the research subject. Qualitative research often investigates complicated phenomena such as human feelings, beliefs, and attitudes that cannot be adequately evaluated or defined. The multiple case study technique is a qualitative research approach that involves conducting various case studies within a single research project. Four to ten case studies are suitable for generalising analytics based on specific criteria (Gibbert et al., 2008). Each case represents a distinct object or unit of analysis, and the researcher chooses the instances based on characteristics that match the research aims. The multiple case study method allows researchers to analyse and evaluate diverse situations, uncover parallels, differences, and trends, establish theories, or offer insights into practical consequences. Multiple case study techniques can provide valuable insights and practical implications for Sri Lankan software entrepreneurs, enlightening other companies in their project management processes by evaluating real-life instances and finding best practices, difficulties, and methods for successful agile adoption. Seven case studies were conducted over two months, focusing on start-ups adopting Agile project management methodologies. According to Eisenhardt (1989) and Gibbert et al. (2008), four to ten case studies are appropriate for creating a good foundation for analytics generalisation. The following factors determined the selection of the cases.

Agile Adoption: Start-ups that have actively adopted Agile project management methodologies, such as Scrum, Kanban, or Extreme Programming.

Start-up Size: Start-ups of varying sizes (small (<50) and medium (60-100)) to understand how Agile adoption may differ based on an organisational scale.

Industry Representation: Start-ups from different industries (FINTECH, SaaS, Consultancy, etc.) within the software sector to capture various experiences and challenges related to Agile adoption.

Agile Maturity Level: Assessing the maturity level of Agile implementation in each start-up, ranging from beginners (3 months into Agile) to advanced practitioners (3+ years into Agile), to examine the impact at different stages of Agile adoption.

Team Composition: To explore how team dynamics affect Agile implementation, start-ups with diverse team compositions, including multidisciplinary or cross-functional teams. (Development Team, Product Management Team, Design Team etc)

Project Types: Start-ups working on various types of projects, such as software development, web development, mobile app development, etc., to understand the applicability of Agile in different contexts.

Duration in the Market: No. of years and milestones they have reached from inception to round of investments – Between 1-5 years since incorporation.

Number of Projects Finished: – At least one project/product release to the market or hand-off to the client/end-user. There must be a minimum of 100 employees and a distinct reporting structure.

Table 1 Composition of Respondents

Respondent	Designation	Organisational orientation
1	CEO, Team Lead	Video Gaming/Software
2	Associate Tech Lead	Fintech
3	Senior Software Engineer	IT
4	Cofounder, Director of Sales	Software as a Service
5	Senior Software Engineer	IT Consultancy

6	Tech Lead	IT
7	Project Manager	IT

Thematic analysis was used to analyse the data. Pattern matching (Miles & Huberman, 1994) and cross-case synthesis were used when analysing data. This study uses a multiple case study approach to analyse software companies in Sri Lanka, focusing on project-based, product-based, or hybrid organisations. The sample size was determined based on the population of Sri Lankan software start-ups and participants with relevant knowledge and experience in agile project management. The primary method of data gathering in this study was semi-structured interviews. Semi-structured interviews provide greater freedom in probing participants for deeper insights while remaining consistent in addressing major research issues. This technique is consistent with the exploratory character of qualitative research and allows for tailoring to the unique experiences of each start-up. They achieve a compromise between standardisation and customisation, making them ideal for capturing varied perspectives in a multi-case setting. They enable the researcher to investigate both predicted and emerging themes, which is critical in a social constructivist framework.

Data was analysed using coding techniques, qualitative methods, and thematic analysis. The findings were interpreted and presented, drawing meaningful conclusions about the impact of agile project management methodologies in Sri Lankan software start-ups. Ethical considerations were maintained throughout the research process, including participant confidentiality, informed consent, and combining semi-structured questionnaires with other data collection methods. The study relied on interviews, which were semi-structured, to elicit participants' emotions, feelings, and opinions on the research topic.

Four interviews were conducted via video conference (Microsoft Teams). The other three interviews were held in person. The interviews varied in length from 45 to 60

minutes. The interviews were done entirely in English. The interviews were all videotaped and transcribed on tape. Consent was received from all respondents following ethical principles. Cross-case analysis and pattern matching were used to analyse the data. The case study methodology was followed to ensure the study's dependability. Numerous data sources, pattern matching, and multiple cases were employed for construct, internal, and external validity. The consistency of the respondents is given in Table 1. The thematic analysis was based on the main research questions. The following section describes each of the key findings under the research questions.

FINDINGS AND DISCUSSION

This chapter presents the study findings based on case sample data, analysed using thematic analysis and cross-case synthesis. Snowball sampling was used with senior professionals in Sri Lankan software companies with over 50 employees. The findings are presented concerning the research questions, and the chapter discusses the challenges faced by these start-ups and strategies to overcome these obstacles.

The findings are presented based on the research questions.

RQ1: What Factors Influence the Adoption of Agile Methodologies in Sri Lankan Start-ups?

This section investigates the elements that influence the adoption of Agile Methodology by Sri Lankan start-ups. The case studies highlight vital issues, including team cooperation, market demand and customer expectations, alignment with industry norms/government rules, external pressures, and influence from interactions. The following topics emerged during the analysis.

Team Collaboration

The findings indicate that team cooperation is critical since start-ups usually have small teams with limited resources. Start-ups collaborating well can better use their resources and achieve their objectives more efficiently.

Respondent 1 stated: *“Games are not software where only or most programmers work. We have many roles, like designers, programmers, technical artists, testers, etc. We wanted a lightweight method to keep all these roles tied to a shared vision and good communication habits. The thing I love about the Agile method is that cross-functional teams work closely together and communicate regularly. Agile encourages team autonomy and ownership of their work. Therefore, factor no.2 is Team*

Collaboration.”

Team cooperation is critical for implementing agile approaches in start-ups. Start-ups that can develop a collaborative culture are more likely to succeed in applying agile methods and realising their benefits. According to the diffusion of innovation theory, individuals and organisations embrace new ideas and technologies over time. According to Rogers (2003), individuals and organisations have embraced new ideas and technology. According to Institutional Theory, organisations are impacted by the social norms and expectations of their surroundings. In the context of agile approaches, firms are more likely to embrace agile practices if their colleagues and consumers regard them as legitimate and desired. According to Meyer and Rowan (1977), organisations engage in "ceremonial" behaviours to conform to institutional standards, even if these procedures have no meaningful influence on their performance. Team collaboration is an essential approach for firms to express their commitment to innovation and recruit and retain top talent in the context of agile techniques.

Market Demand and Client Expectations

Market demand and customer expectations are essential factors that may influence start-ups' adoption of agile methodologies. Start-ups that can demonstrate their Agile capabilities have a higher chance of acquiring and retaining clients and meeting the demands of a competitive market.

Respondent 1 stated: “High importance. Video games are a heavily customer-centric industry. As mentioned in the previous

answer, meeting market demand and exceeding player expectations are crucial. Agile's iterative and feedback-driven approach aligns well with this." Respondent 2 said: *"To adopt agile methodologies, its customer-centric approach influenced us the most."*

According to Institutional Theory, organisations are impacted by the social norms and expectations of their surroundings. In the context of agile techniques, businesses are more likely to embrace agile practices if their clients and other stakeholders regard them as legitimate and desired. Organisations that embrace agile techniques to fulfil market demand and customer expectations demonstrate their conformance to institutional expectations in the context of agile methodology.

Alignment with Industry Norms/Government Policies

Industry norms and government policies can pressure businesses to adopt Agile principles, making them feel legitimate and competitive. The Sri Lankan government's National Innovation Policy and Start-up Sri Lanka program, for example, encourage innovation and entrepreneurship.

Respondent 2 stated: "I think it is essential to maintain the industry standards as a start-up because sometimes a project might get much attention, and sometimes, in such cases, we have to provide the solution in less time. Also, since we are in the FinTech sector, we must follow the industry norms critically. I think adopting agile would ease the work."

Respondent 3 said: *"Aligning with the industry norms and practices became crucial for us. Especially when fulfilling the client's expectations."*

More research is needed to support the issue of alignment with industry norms/government rules as a factor impacting agile methodology adoption in Sri Lankan entrepreneurs. However, few studies have been conducted on the influence of industry standards and government legislation on agile adoption in other nations. Khan et al. (2023) discovered that government policies significantly drove Agile adoption among Pakistani firms. More

study is needed, however, to determine the influence of industry standards and government legislation on Agile adoption among Sri Lankan start-ups.

According to Resource Dependency Theory, organisations rely on other organisations for the resources they require to exist and grow. Customers, suppliers, partners, and government agencies are examples of resources. According to Pfeffer and Salancik (1978), organisations rely on other organisations for the resources they require to exist and grow. Customers, suppliers, partners, and government agencies are examples of resources. Access to these resources is more likely for organisations that adhere to industry standards and government rules.

External Pressures

Customers expect start-ups to use agile approaches for high-quality products and services, and investors may support firms that use these methods. Agile processes are seen as a sign of innovation and competitive advantage, and peers may encourage start-ups to adopt them. This is due to the increasing prevalence of agile approaches in software development.

Respondent 3 stated: "Sometimes clients push too much when expecting Agile methodologies. The team was uncomfortable doing Sprint releases when adapting to Agile. Some clients used to take control of our project management process, which has led to an imbalance in our workflow."

Respondent 6 elaborated: *"Yes. Clients have requested to adapt to agile methodologies since overseas developers practice them. So, it will be easier to work if everyone follows the same agile processes"*.

According to Institutional Theory, organisations are impacted by the social norms and expectations of their surroundings. External forces might have an impact on institutional norms and expectations. For example, customer demand for agile approaches might establish a societal norm that expects businesses to embrace agile practices. External factors such as consumer demand and government laws can establish

institutional norms and expectations that push start-ups to adopt agile practices in the context of agile methodology.

Influence from Interactions

Interactions play a crucial role in agile adoption, facilitating cooperation and communication among stakeholders. Agile approaches like daily stand-ups, sprint retrospectives, and pair programming require tight team contact, while interactions with clients aid in understanding expectations.

Respondent 4 emphasised: *“Learning from the experiences of other start-ups can provide real-life examples of how agile methodologies have been successfully implemented. They often bring insights into agile methodologies’ practical benefits and challenges, helping start-ups make informed decisions and avoid common pitfalls.”*

Respondent 5 stated: *“Interactions with other start-ups and participation in industry events provided valuable insights and real world examples of successful agile adoption. Government policies, particularly those promoting digital transformation, underscored the relevance and benefits of agile methodologies. These interactions collectively improved our understanding and conviction in the effectiveness of agile practices.”*

Respondent 7 said: *“Through industry gatherings, we have learnt from the experiences of other entrepreneurs and gotten insights into best practices and potential problems.”*

While there is no study on the issue of Interaction Influence as a Factor Influencing Agile Methodology Adoption in Sri Lankan Start-ups, research on the relevance of interactions for agile adoption, in general, implies that this theme is likely to be relevant. This discovery has gone unnoticed in the literature. As a result, this is a novel discovery. According to Institutional Theory, organisations are impacted by the social norms and expectations of their surroundings. Interactions with other organisations might influence these standards and expectations. Interactions with customers, suppliers, and industry peers, for example, may assist firms

in understanding the current trends and best practices in agile techniques. Interactions with other businesses in the context of agile techniques can assist start-ups in understanding and conforming to institutional norms and expectations linked to agile adoption.

RQ2: What are the Challenges and Barriers Sri Lankan Software Start-ups Face when Adopting Agile Methodologies?

The analysis highlights the challenges and barriers Sri Lankan software start-ups face in adopting Agile methodologies, including resource constraints, cultural factors, resistance, industry norms, and uncertainty concerns (Pikkarainen et al., 2008).

Resource Constraints

Due to resource restrictions and budget constraints, start-ups may need help to invest in training, tools, and infrastructure for agile adoption. Successfully managing these constraints increases the likelihood of adopting agile approaches and gaining benefits. Due to resource constraints, Sri Lankan software start-ups need help adopting agile methodologies. According to Resource Dependency Theory, organisations rely on other organisations for resources, such as customers, suppliers, partners, and government agencies. Limited resources can make it difficult for these businesses to attract and retain top personnel, making agile approaches less effective. This unique finding highlights the importance of understanding and addressing resource constraints in agile methodologies.

Respondent 1 emphasised: *“The start-up struggled to adopt agile methodologies due to resource constraints, including access to expensive Agile training and limited team members. This led to ineffective roleplaying and a lack of dedicated roles, affecting the project’s overall success.”* Respondent 2 stated: *“Sometimes a single person must work on multiple projects, fixing issues and new features. At those times, it is practically impossible to follow agile methodologies.”* Respondent 7 said: *“Resource restrictions, minimal money and access to technical*

knowledge have hampered our start-up's capacity to embrace agile approaches. We have to think outside the box to develop agile capabilities within our business.”

While no specific research has been conducted on resource constraints as a challenge and barrier Sri Lankan software start-ups face when adopting Agile Methodologies, this theme is likely relevant. The community has ignored this revelation, making this a unique finding. According to Resource Dependency Theory, organisations rely on other organisations for the resources they require to exist and grow. Firms that have resource limits may be more subject to external forces and have less negotiating leverage with other firms. For example, businesses with limited resources may find attracting and retaining top personnel challenging, making it difficult to use agile approaches effectively. According to Pfeffer and Salancik (1978), organisations rely on other organisations for the resources they require to exist and grow. Customers, suppliers, partners, and government agencies are examples of resources. Firms that have resource limits may be more subject to external forces and have less negotiating leverage with other firms. For example, businesses with limited resources may find attracting and retaining top personnel challenging, making it difficult to use agile approaches effectively.

Cultural Factors

Cultural factors can influence the adoption of agile methodology, with hierarchical cultures incompatible with collaborative, decentralised approaches and risk-averse cultures affecting iterative, experimental methods. Start-ups that effectively navigate these issues are more likely to adopt agile methods. Cultural factors, including trust and aversion to change, can hinder start-ups from implementing agile practices (Fernando & Kapurubandara, 2015; Misra, 2007). Innovation diffusion is influenced by five elements: relative advantage, compatibility, complexity, trial ability, and observability. These factors can be affected by national, organisational, and industry culture.

Respondent 2 stated: *“Meeting customer expectations and matching them with Agile principles can be difficult, especially when clients expect outcomes without adhering to basic Agile standards.”*

According to Rogers (2003), individuals and organisations have embraced new ideas and technology. The theory outlines five essential elements influencing innovation diffusion: relative advantage, compatibility, complexity, trial ability, and observability. All five of these elements can be influenced by culture. Cultural factors such as national culture, organisational culture, and industry culture, for example, can influence the perceived relative advantage of agile methodologies, the compatibility of agile practices with existing culture and processes, the perceived complexity of implementing agile methodologies, the trial ability of agile practices, and the observability of agile benefits.

Resistance

The study indicates opposition to adopting agile approaches in Sri Lankan software business organisations due to the country's risk-averse and hierarchical culture, which may be resistant to change and unfamiliar with agile methods. Many firms need more skills and knowledge to implement these changes. Resistance to adopting agile methodologies in Sri Lankan software start-ups is a unique finding. According to the Diffusion of Innovation Theory, individuals or organisations may only accept change if they perceive agile approaches as risky, complex, or incompatible with their current practices. Institutional Theory suggests that organisations are influenced by social norms and expectations, which can lead to resistance to change. For instance, a Sri Lankan software firm may face opposition from traditional waterfall development processes.

Respondent 6 stated: *“Initially, there were since we had no experience. However, with some practice sessions and workshops, we were able to transition into that smoothly.”*

While no specific research has been conducted on Resistance as a Challenge and Barrier Sri Lankan Software Start-ups Face

When Adopting Agile Methodologies, this theme is likely relevant. This revelation has gone ignored by the community. As a result, this is a unique finding. According to the diffusion of innovation theory, individuals and organisations embrace new ideas and technologies over time. Individuals or organisations may resist change if they believe an innovation, such as agile approaches, is too risky, too complex, or incompatible with their current practices. Resistance might arise when employees or management believe agile approaches to be too hazardous, too tricky, or incompatible with the organisation's existing culture and practices. According to Institutional Theory, organisations are impacted by the social norms and expectations of their surroundings. When companies are pressured to comply with institutional norms and expectations incompatible with their new aims or practices, resistance to change can arise. Resistance can arise when businesses feel pushed to comply with institutional norms and expectations incompatible with agile principles. For example, a Sri Lankan software firm may meet opposition from staff or customers who are more comfortable with traditional waterfall development processes.

Industry Norms and Expectations

Industry standards and expectations are complex and diverse, varying based on industry, nation, and culture. Three respondents deem them imperative, as evidenced by quotes. Industry norms and expectations can challenge Sri Lankan software start-ups when adopting agile methodologies. Institutional Theory and Resource Dependency Theory suggest that these norms can influence the adoption of agile approaches. For instance, a start-up may be less likely to adopt agile if it believes it differs from the industry standard. Additionally, acquiring unfamiliar clients or suppliers may take time and effort.

Respondent 6 stated: *“Faster project delivery and increased team collaboration contributed to our business challenges when adopting agile.”*

Respondent 7 elaborated: *“Industry standards and expectations might create pressure to comply with traditional project management practices, making adopting agile methodology difficult. Clients, Investors, or Partners who expect more traditional approaches may resist start-ups' agile transition”.*

While no specific research has been conducted on Industry Norms and

Expectations as a Challenge and Barrier Sri Lankan Software Start-ups Face When Adopting Agile Methodologies, this theme is likely relevant. The community has ignored this revelation. As a result, this is a unique finding. According to Institutional Theory, organisations are impacted by the social norms and expectations of their surroundings. Sector norms and expectations are social norms that can impact businesses' conduct in a particular sector. Industry Norms and Expectations might impact whether to embrace agile approaches in the setting of agile methodology. For example, a Sri Lankan software start-up may be less inclined to use agile approaches if it believes agile is not the standard in the Sri Lankan software business.

According to Resource Dependency Theory, organisations rely on other organisations for the resources they require to exist and grow. Industry standards and expectations can influence the availability of resources to companies. Industry norms and expectations might impact the availability of resources to firms in the context of agile approaches. For example, a Sri Lankan software firm may find acquiring clients or suppliers unfamiliar with agile processes challenging.

Concerns about Uncertainty

Start-ups may need help predicting product release due to the unpredictable nature of agile methods, which require constant response to client input and forecasting future customer needs. Additionally, they may lack the necessary resources or skills to implement agile approaches, effectively highlighting the importance of uncertainty. Uncertainty poses a challenge for Sri Lankan software start-ups when adopting agile methodologies. According to the Resource Dependency

Theory, uncertainty can hinder access to essential resources like customers, suppliers, partners, and government agencies. Businesses may be less likely to adopt new practices if they perceive them as uncertain. This can stifle innovation dissemination, as individuals and organisations are less inclined to adopt new practices they perceive as dangerous or complicated.

Respondent 1 declared: *“The main concern is that the video game development industry is inherently uncertain. Game development involves creative work, evolving technologies, and shifting market dynamics, making it challenging to predict outcomes accurately. Traditional waterfall approaches struggle to manage these uncertainties, which often leads projects to delay and changes which cost”*.

While no specific research has been conducted on concerns about uncertainty as a challenge and barrier Sri Lankan software start-ups face when adopting Agile methodologies, this theme is likely relevant. The community has ignored this revelation, making this a unique finding.

According to Resource Dependency Theory, organisations rely on other organisations for the resources they require to exist and grow. Uncertainty can make it more difficult for businesses to access essential resources such as customers, suppliers, partners, and government agencies. This is because stakeholders may be less eager to invest in businesses that they perceive to be uncertain. As a result, if businesses believe that new practices, such as agile techniques, may raise uncertainty, they may be less likely to embrace them.

Innovation Diffusion Individuals and organisations, according to theory, embrace new ideas and technology throughout time. Uncertainty can stifle innovation dissemination because individuals and organisations are less inclined to adopt new practices that they perceive to be uncertain. For example, a Sri Lankan software firm may be less inclined to embrace agile approaches if it perceives agile as a dangerous or complicated process.

RQ 3: How do Sri Lankan Software Start-ups overcome challenges and barriers when adopting Agile methodologies?

This section explores strategies for overcoming challenges and barriers in adopting Agile methodologies, focusing on resource constraints, external support, addressing cultural resistance, and valuable insights from business owners (Nasehi, 2013).

Strategies for Resource Constraints

Resource constraints were a significant obstacle to agile adoption in Sri Lankan start-ups. However, these barriers were overcome by developing innovative resource management solutions. Agile businesses prioritise critical tasks, rely on cross-functional teams, and scale resources as needed. Automation simplifies operations and reduces manual intervention, freeing resources for higher-value tasks. Strategies for resource constraints are crucial, according to seven respondents. Resource Dependency Theory suggests that organisations rely on others, such as customers, suppliers, partners, and government agencies, for resources. Efficient resource management allows organisations to adapt to environmental changes and invest in new techniques. Innovation diffusion occurs when individuals and organisations embrace new ideas and technology, overcoming resource restrictions to experiment with new techniques and implement practices on a broader scale.

Respondent 1 declared: *“After talking with different international video game publishers at our start-up, we started focusing on delivering a Minimal Viable Product (MVP) early in the development process, which allowed us only to allocate resources to core features and functionalities. This action ensured the release of a functional product even with limited resources. Also, we considered outsourcing and partnering with other local individuals or start-ups, which extended our capabilities without increasing any internal resources.”*

Respondent 5 stated: *“To overcome resource constraints while adopting agile methodologies, our start-up has leveraged open-source tools and platforms to reduce*

software licensing costs. We have also focused on upskilling our existing team members and reducing the need for external technical expertise. Additionally, we have implemented a phased approach to agile adoption, allowing us to scale gradually based on available resources and budget.”

While no specific research has been conducted on strategies for resource constraints, such as overcoming challenges and barriers when adopting Agile Methodologies, this theme is likely relevant. The community has ignored this revelation, making this a unique finding.

According to Resource Dependency Theory, organisations rely on other organisations for the resources they require to exist and grow. Customers, suppliers, partners, and government agencies are examples of resources. Organisations that can efficiently manage their resources are more likely to be able to adapt to environmental changes, such as changing market circumstances or technological breakthroughs. Organisations with sound resource management are more likely to be able to invest in new techniques and technology, such as agile approaches. Innovation diffusion among individuals and organisations, according to theory, embraces new ideas and technology throughout time. Organisations that can overcome resource restrictions are more likely to be able to experiment with new techniques like agile approaches. Organisations that are capable of adequately managing their resources are more likely to be able to implement new practices on a broader scale. Organisations capable of adequately managing their resources are more likely to maintain the adoption of new techniques over time.

External Support and Mentorship

External assistance and mentoring can provide firms with knowledge and support in agile processes, particularly for those new to elegant or lacking internal resources. These resources can help firms overcome obstacles and progress towards their objectives. They also help maintain responsibility and motivation, ensuring firms stay on track and meet their agile adoption goals. According to

Resource Dependency Theory, organisations that can acquire and exploit external help and mentoring gain a competitive advantage, adapt to environmental changes, and invest in new practices and technology. Additionally, external assistance and mentoring can hasten the spread of innovation by helping individuals and organisations learn and adopt new practices.

Respondent 2 stated: *“We had a project owner, a certified scrum master. Now, we are following his instructions. It was rather internal support”.*

Respondent 7 declared: *“Yes, we sought outside assistance and mentoring to help us negotiate the hurdles of adopting agile approaches. This assistance has been critical in providing guidance, sharing best practices, and providing useful insights. It sped up our learning curve and made the transfer easier.”*

A study published in the Journal of Information and Management by Cao et al. (2022) discovered that external assistance and mentorship had a beneficial influence on the success of agile adoption in Chinese firms. According to the report, external support and mentorship can assist businesses in overcoming various obstacles, including A lack of understanding and expertise with agile techniques, employees' and other stakeholders' resistance to change, and difficulty coordinating work across teams and managing resources.

Mendes et al. (2021) discovered that external assistance and mentorship were critical factors in adopting agile approaches in organisations in a study published in the journal Agile Management Systems. According to the survey, external support and mentoring may help companies develop a better knowledge of agile approaches and how to successfully adopt them, determine and resolve possible issues, and obtain comments and assistance from other firms that have successfully implemented them.

According to Resource Dependency Theory, organisations rely on other organisations for the resources they require to exist and grow. Customers, suppliers, partners, and government agencies are examples of resources. Organisations that can acquire and

exploit external help and mentoring can gain a competitive advantage. Organisations that can obtain and exploit external help and mentoring are more likely to be able to adjust to environmental changes, such as changing market circumstances or technological breakthroughs. Organisations that can access and exploit external help and mentoring are more inclined to invest in new practices and technology, such as agile approaches.

Innovation Diffusion Individuals and organisations, according to theory, embrace new ideas and technology throughout time. External assistance and mentoring may hasten the spread of innovation by assisting individuals and organisations in learning about and adopting new practices, such as agile approaches. Organisations with access to outside assistance and mentoring are more likely to be aware of new techniques, such as agile approaches. Organisations with access to external help and mentoring are more likely to have the resources and expertise to implement new practices, such as agile techniques. Organisations with access to external help and guidance are more likely to overcome the hurdles of implementing new practices, such as agile approaches.

Addressing Cultural or Organisational Resistance

Managing cultural or organisational resistance is crucial for firms implementing agile approaches, as eliminating these barriers can enhance their chances of success and achieving business goals. The Diffusion of Innovation Theory suggests that organisations adopt new ideas and technologies over time, but must overcome hurdles like reluctance to change and lack of understanding. Organisations that can handle cultural or organisational resistance are more likely to adopt new techniques, overcome change resistance, and sustain innovation. Institutional Theory emphasises the importance of addressing cultural or organisational resistance to gain legitimacy, adjust to institutional changes, and recruit and retain resources.

Respondent 2 stated: *“We separated employees into smaller teams, and when a*

requirement comes, we shuffle the teams. Then, they can interact and break the barriers. Sharing the work and shuffling.” Respondent 6 declared: *“Organising workshops to let the developers, PMs, and POs work collaboratively has helped us to overcome these barriers.”*

Research published in the journal Information Systems Frontiers by Singh et al. (2021) discovered that cultural or organisational resistance is a crucial obstacle to agile adoption success, particularly in businesses with a solid conventional culture. The study discovered that to integrate agile approaches successfully, firms must create and apply unique solutions to manage cultural or organisational resistance. According to the diffusion of innovation theory, individuals and organisations embrace new ideas and technologies over time. To succeed, organisations must overcome the hurdles of innovation adoption, such as reluctance to change and a lack of understanding of new techniques. Organisations that can handle cultural or organisational resistance are more likely to be aware of new techniques like agile approaches. Organisations that can handle cultural or organisational resistance are more likely to overcome change resistance. Organisations overcoming cultural or organisational barriers to innovation are more likely to sustain it over time.

According to Institutional Theory, organisations are impacted by the social norms and expectations of their surroundings. Addressing cultural or organisational resistance is critical for companies to achieve this, as it may assist them in overcoming opposition to change and implementing new practices consistent with the institutional context. Organisations that can overcome cultural or organisational opposition are more likely to be seen as legitimate by their stakeholders. Organisations that can handle cultural or organisational opposition are more likely to be able to adjust to institutional changes. Organisations that can overcome cultural or organisational opposition are more likely to recruit and retain resources from their surroundings.

VALUABLE INSIGHTS AND LESSONS

This section will delve into the valuable insights and lessons business owners share.

Respondent 1 stated: *“Start-ups should start small and scale gradually to build confidence in Agile's benefits and practical applications. In-house projects should be used to practice agile before client projects, allowing for less damage. Transparency is key, and sharing successes and failures builds trust and collaboration. Every step is a milestone; feedback from team members, clients, and stakeholders is invaluable. Recognising and celebrating small successes creates a positive atmosphere.”* Respondent 2 declared: *“Working together and mentoring each other. Because we have different people coming with different skill sets, we do not have a culture like senior and junior people. We question and learn”.*

Respondent 3 expressed: *“Understanding Agile and Test-Driven Development practices is crucial for reliable product delivery. Pair programming improves team collaboration, reduces code review hours, and emphasises quality assurance through Sprints. Acceptance tests and early project delivery predictions are also important.”* Respondent 4 declared: *“Strong leadership support is crucial. When leaders actively endorse and practice agile principles, it sets a positive example and can encourage broader acceptance.”* Respondent 5 declared: *“From our experience, we have learned that effective communication and gradual change management are key to overcoming resistance to agile adoption. It is crucial to involve the entire team in the process, foster a culture of continuous improvement, and remain adaptable in the face of challenges. Embracing agile as a mindset, not just a process, has been a transformative lesson for us.”*

Respondent 6 stated: *“We should always listen to others' suggestions and opinions to make a well-refined decision. It will be helpful to build trust between the team members and the bond between them. This will also support the team's productivity.”*

Respondent 7 declared: *“The importance of effective communication, gradual change management, involving the entire team in the process, fostering a culture of continuous improvement, and remaining adaptable in the face of challenges are just a few of the valuable insights and lessons we have learned from our experience overcoming challenges and barriers while adopting agile methodologies”.*

CONCLUSION

The study, conducted using seven Sri Lankan start-ups, aimed to identify factors influencing agile adoption and obstacles these firms face. It used cross-case analysis and explored strategies to overcome these challenges. The findings provide valuable insights for stakeholders aiming to maximise Agile practice integration within their organisations.

Research Question 1: What are the key factors influencing the adoption of Agile methodologies in organisations? The findings show that various factors significantly impact the adoption of Agile techniques in Sri Lankan start-ups. Team cooperation emerges as a critical component, enabling an atmosphere favourable to Agile adoption. Furthermore, market demand, customer expectations, conformity with industry standards and government legislation, and external forces all influence Agile adoption decision-making.

Research Question 2: What are the significant challenges and barriers organisations face when adopting Agile methodologies?

The obstacles and constraints Sri Lankan software companies found in adopting Agile methodology highlight the diverse nature of obstructions. Resource restrictions, cultural problems, opposition, industry standards, and uncertainty concerns all work together to obstruct the seamless integration of Agile principles inside these businesses.

Research Question 3: How can organisations effectively overcome the challenges and barriers of adopting Agile methodologies?

The study identifies various solutions for overcoming barriers to Agile adoption among

Sri Lankan software companies. Tackling resource restrictions through inventive techniques, finding external help and mentorship, balancing stability and flexibility, tackling cultural or organisational opposition, and highlighting the importance of feedback and tiny successes are some of these strategies. Furthermore, specialised Agile methods such as test-driven development, pair programming, and strong leadership support are critical in breaking down obstacles.

Several recommendations are made based on the study's findings:

Create awareness and education initiatives: Through seminars, training programs, and industry events, raise knowledge of Agile methodologies among Sri Lankan software entrepreneurs. Provide teaching resources and case studies that show the benefits of Agile techniques and their successful adoption. This can assist in overcoming reluctance to change and foster an open and learning culture.

Resource Optimization Strategies: Create plans to alleviate resource restrictions by encouraging creative financing and talent acquisition methods. Collaborate with industry stakeholders or government agencies to develop start-up-specific resource assistance initiatives.

Encourage cooperation and knowledge sharing: Facilitate channels and opportunities for software start-ups to exchange Agile-related experiences, issues, and best practices. To build a continual learning and improvement culture and encourage collaboration between entrepreneurs, industry professionals, and academia. Sharing success stories and lessons gained can boost confidence and inspire others to use Agile.

Adapt Agile methodologies to the local environment: When applying Agile techniques, consider the specific cultural, organisational, and market aspects of Sri Lankan software start-ups. Adapt Agile frameworks and methods to the needs and problems of the local context, such as skilled resource availability, consumer preferences, and market expectations. This modification could increase the relevance and efficacy of Agile techniques in Sri Lankan start-ups.

Mentorship and coaching: Mentorship and coaching programs assist start-ups in their Agile adoption journey. Experienced Agile practitioners may offer advice, solve problems, and share practical ideas. This hands-on assistance can shorten the learning curve and help start-ups navigate the intricacies of Agile development.

Establish Agile communities and networks: Encourage the creation of Agile practitioner communities or networks in Sri Lanka. These communities can be used as a networking, knowledge exchange, and peer learning platform. They can host frequent gatherings, conferences, or user groups to share experiences, debate issues, and work on Agile-related projects.

Encourage top-down cooperation: Seek the assistance of senior management and leaders in Sri Lankan software start-ups. Their support and commitment to Agile approaches can help to establish an atmosphere receptive to adoption. To set a good example for the rest of the organisation, leaders should be encouraged to promote the benefits of Agile principles, allocate required resources, and actively participate in Agile activities.

Recognise and address cultural and mindset barriers: Recognise and resolve any cultural or mental hurdles that may impede the

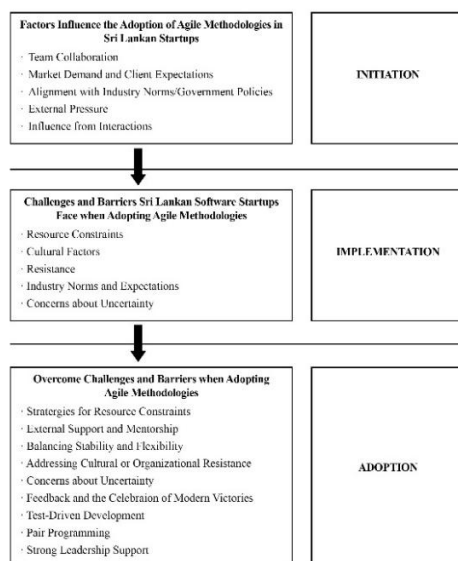


Figure 1: Diagram for Analysis and Discussions

adoption of Agile methodology. Encourage a culture of collaboration, adaptability, and risk-taking. Encourage iterative and adaptable project management practices, emphasising the need for transparency, self-organisation, and continual development.

Progress should be monitored and evaluated: Create systems to track and assess the progress of Agile adoption in Sri Lankan software start-ups. Examine the impact of Agile approaches on project success rates, customer happiness, team performance, and other vital indicators regularly. Use these insights to fine-tune strategy, spot areas for improvement, and share success stories with the start-up community.

Use of Theories

This study provides a solid theoretical framework for understanding the issues surrounding the adoption of Agile techniques in Sri Lankan software start-ups by employing Institutional Theory, Resource Dependency Theory, and the Diffusion of Innovation Theory. They provide views to evaluate and interpret the connections between external forces, resource constraints, and the Agile practice diffusion process.

These ideas enable a more sophisticated understanding of the contextual elements impacting Agile adoption. Institutional Theory explains how social norms and expectations influence business behaviour, offering insight into compliance and industry standards. The Resource Dependency Theory assists in recognising and addressing the issues given by resource restrictions while also directing tactics for overcoming limitations. The Diffusion of Innovation Theory sheds light on the growth of Agile methodologies inside the social system of Sri Lankan software companies, highlighting hurdles and facilitators. Using these ideas, this study gave predictive insights into how external pressures, resource dependencies, and the diffusion process influence Agile methodology acceptance and implementation. This enabled the identification of possible obstacles and possibilities for effective Agile integration in Sri Lankan software firms.

Understanding the consequences of these ideas allows for the development of practical recommendations and tactics. Institutional Theory insights inform compliance techniques, Resource Dependency Theory insights inform resource allocation tactics, and Diffusion of Innovation Theory insights assist in creating successful change management strategies customised to the Sri Lankan software start-up setting.

FURTHER RESEARCH AND INDUSTRY COLLABORATION

Encourage more research and industry collaboration to dive deeper into the dynamics of Agile adoption and investigate the long-term influence on organisational performance. Encourage cooperation between academics, businesses, and government to create personalised support systems for Agile adoption in start-ups.

The sample size of the participating software start-ups may be limited due to time and budget constraints, limiting the findings' generalizability to the whole population of start-ups in Sri Lanka. This limitation can be alleviated by ensuring the sample covers a diverse range of start-ups. Conducting interviews and surveys with project managers at software start-ups can be challenging due to availability, willingness to participate, and reaction. It will be crucial to overcome this problem by increasing response rates while maintaining data quality.

Respondents may exhibit social desirability bias, leading to overestimating positive Agile adoption experiences. To combat this, highlighting the anonymity and confidentiality of responses during data collection may be beneficial.

Some software companies may need more time to provide internal project data, making obtaining comprehensive and accurate data for analysis challenging. Collaboration and trust-building with businesses can help overcome this hurdle. The research timeframe may limit the investigation of the long-term effects of Agile adoption. The study may only capture a subset of Agile's long-term advantages.

Although the Diffusion of Innovations theory is accurate, it may only account for some of the complexities and dynamics of Agile adoption in software businesses. Adding multiple frameworks to the theory might improve the theoretical basis of the inquiry.

Changes in the market environment, economic situations, or legislative developments can all impact Agile adoption and its impact on software companies in ways the research cannot control.

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