Antecedents of Internal Stakeholder Satisfaction of Agile Projects: Evidence from the Sri Lankan Software Industry

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Abstract - Internal stakeholder satisfaction is critical for project success. Adopting agile methodologies in software projects is perceived as a more adaptable approach than traditional project management methods, potentially leading to higher internal stakeholder satisfaction. However, numerous agile projects in the Sri Lankan software industry struggle with poor internal stakeholder satisfaction. Addressing this gap, the study has investigated the drivers of internal stakeholder satisfaction in agile projects within the Sri Lankan software industry. Accordingly, the five most appropriate practices – communication among internal stakeholders, frequent customer feedback, iterative development, collaboration, and flexibility to adopt customers' late changes and a mediating factor – trust were identified, forming the basis for the conceptual framework. To evaluate it, the researchers analysed data from 137 internal stakeholders using multiple linear regression. The results showed that trustworthy communication, iterative development, and collaboration have a positive impact on internal stakeholder satisfaction, while mere communication among internal stakeholders, frequent customer feedback, and flexibility to adopt customers' late changes do not significantly impact internal stakeholder satisfaction in this context. The research provides valuable insights and practical recommendations to enhance internal stakeholder satisfaction in agile projects.

Keywords: Agile Methodology, Agile Projects, Internal Stakeholder Satisfaction, Software Industry

I. INTRODUCTION

To classify a project as successful, it needs to cover the entire scope within the budget and the specified time frame, and it must satisfy at least the key stakeholders of the project (Huijgens et al., 2017). Therefore, stakeholder satisfaction has been a key indicator of any successful project (Al Hawajreh et al., 2014). However, according to Project Management Institute (PMI) Statistics in 2021, approximately 70% of projects have failed due to various reasons such as lack of clear goals, poor communication, and collaboration among stakeholders (Project Management Institute, 2021).

The traditional project management approach (e.g., waterfall method) has been criticized in the context of software industry projects due to its limitations in handling complexity and lack of flexibility (Prasad et al., 2018). To address these challenges, many software companies in Sri Lanka have adopted agile project management methodology. Agile has been collaborating with cross-functional teams to deliver software products, enabling them to adapt to frequent changes in customer perception and fostering stakeholder collaboration. This approach has emphasized delivering completed work at regular intervals (Hawajreh et al., 2014; Prasad et al., 2018).

While the agile methodology offers several advantages to meet the stakeholders' needs, numerous projects in the Sri Lankan software industry have failed due to a lack of internal stakeholder satisfaction (ISS), as indicated by SLASSCOM statistics (SLASSCOM & PwC, 2021). To investigate this issue, the authors engaged in intensive discussions with six industry experts. These discussions brought to light the fact that more

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than 70% of projects did not fully satisfy their internal stakeholders, despite their adoption of agile methodology. This reveals a critical gap in understanding the practices that drive ISS in Agile projects in the Sri Lankan software industry.

Previous studies such as, Serrador and Pinto (2015) have investigated critical success factors and project success in agile projects. However, hardly any past research has investigated the drivers of ISS in agile projects specifically in the Sri Lankan software industry. ISS is a cornerstone for project success, yet the drivers that influence it remain underexplored in this context. This gap in the literature forms the basis of this research.

The objective of this study is to address the issue of poor ISS in agile projects run by several software firms in Sri Lanka. Specifically, the research aims to identify the key drivers that influence ISS in Agile projects. To achieve this, the authors pursued the following sub-objectives; (a) to identify possible factors through a thorough literature review, (b) to shortlist the most appropriate factors then (c) to examine the impact of the identified factors on ISS of agile projects in the Sri Lankan software industry and finally (d) to provide recommendations to improve ISS of agile projects in the Sri Lankan software industry.

The significance of this study lies in its potential to inform software companies in Sri Lanka and other developing countries about the drivers of ISS in Agile projects. To measure the efficacy of agile projects and their success, ISS has been identified as a crucial aspect (Serrador & Pinto, 2015). Therefore, by implementing the identified core practices, practitioners can improve project outcomes and overall satisfaction among internal stakeholders. Moreover, the findings will contribute to the broader understanding of Agile project management's effectiveness in different industry contexts. Based on this background, this study proposes a set of drivers that enable higher ISS in agile projects in the Sri Lankan software industry.

II. LITERATURE REVIEW

The authors conducted a comprehensive systematic literature review to identify possible factors that affect the ISS of agile projects within the software industry context. For that, authors adopted the seven-step procedure proposed by Forbes (2003) to execute the systematic literature review: (1) formulate a well-defined question that guides the literature review, (2) develop relevance and validity tools to determine what criteria should be used to decide which articles to include in the review, (3) conduct a comprehensive search to retrieve published and unpublished reports, (4) assess reports that fulfil the relevance and validity tools, (5) extract the relevant results from the selected studies, (6) synthesis of the findings and (7) report writing.

The review question that guided the literature review in this study is: What are the possible factors that would drive ISS in agile projects within the software industry? Once finalizing the review question, the authors established the article search criteria and inclusion criteria. Table 1 presents a summary of the inclusion criteria.
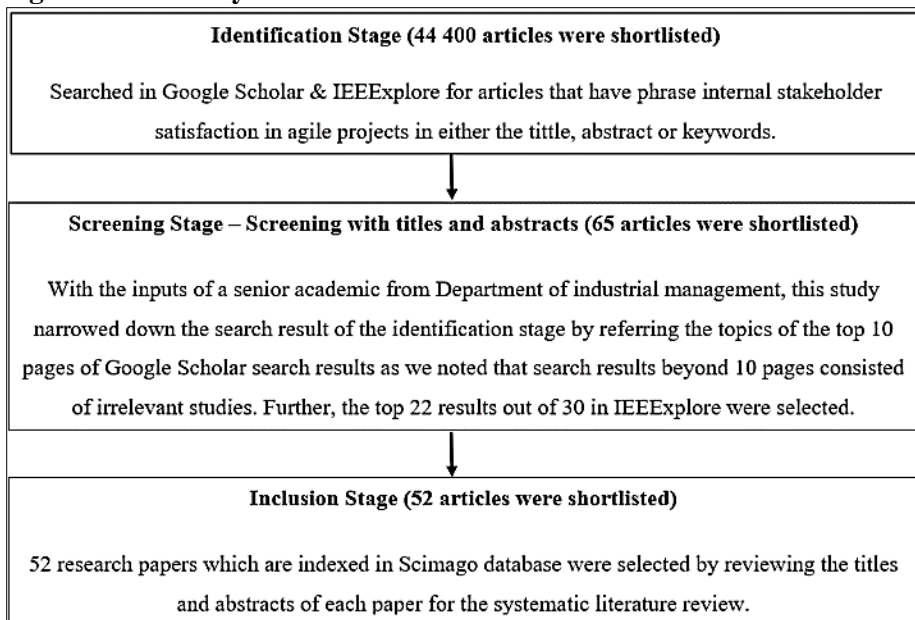
Table 1. Criteria for Inclusion

Characteristic	Inclusion Criteria
Type of publication	Peer-reviewed journal articles, conference papers, book chapters indexed in Scimago
Language(s)	English
Time period	From 2010 to 2023
Research design	Conceptual and empirical
Content	Studies on ISS in agile projects and the success of projects
Source	Google Scholar, IEEExplore

Source: Authors' compilation.

In this research, the authors limited the search to articles written in English, as it is commonly understood by all the authors and is widely understood by researchers worldwide. The authors included only peer-reviewed journal articles, book chapters, and conference papers which are indexed in Scimago. We decided to do so since it was also an inclusion criterion in other review articles published in reputed journals previously (e.g., Schlachter et al., 2018). Furthermore, the authors considered only the Google Scholar and IEEExplore databases for searching articles, as recommended by previous articles published in reputed journals (e.g., Huijgens et al., 2017). Additionally, the study only considered articles on ISS in agile projects and the success of projects that were published between 2010 and 2023.

After finalizing the inclusion criteria, researchers conducted the search process in three steps (i.e., identification, screening, and inclusion), as mentioned in previous studies (e.g., Chathuranga et al., 2023; Jayasinghe et al., 2023; Jayasinghe et al., 2022; Sarfraz et al., 2018).

Figure 1. Summary of the Article Search Process

Identification Stage (44 400 articles were shortlisted)

Searched in Google Scholar & IEEExplore for articles that have phrase internal stakeholder satisfaction in agile projects in either the tittle, abstract or keywords.

Screening Stage – Screening with titles and abstracts (65 articles were shortlisted)

With the inputs of a senior academic from Department of industrial management, this study narrowed down the search result of the identification stage by referring the topics of the top 10 pages of Google Scholar search results as we noted that search results beyond 10 pages consisted of irrelevant studies. Further, the top 22 results out of 30 in IEEExplore were selected.

Inclusion Stage (52 articles were shortlisted)

52 research papers which are indexed in Scimago database were selected by reviewing the titles and abstracts of each paper for the systematic literature review.

Source: Authors' compilation.

During the identification stage, the authors conducted a search on Google Scholar and IEEExplore using the phrase "internal stakeholder satisfaction in the agile project". We compiled a total of 44,400 articles in this stage.

Next, the study initiated the screening stage. The authors used Google Scholar and IEEExplore for article identification. We chose the top 10 pages of Google Scholar for the screening process because the authors noted that search results beyond 10 pages consisted of irrelevant studies. Additionally, we selected the top 22 results out of 30 in IEEExplore.

To enhance the screening process, the authors sought expert opinions from a senior academic in the Department of Industrial Management at the University of Kelaniya, Sri Lanka. The expert reviewed the identified studies and provided suggestions to further filter the articles. At the end of the screening stage, the authors shortlisted 65 articles. During the inclusion stage, the study involved reviewing the titles and abstracts of each relevant study. Further, the authors utilized the Scimago database to aid in the article-limiting process. At the end of the screening, the authors identified 52 peer-reviewed studies indexed in the Scimago database. By reviewing those articles, we identified 11 possible factors that would drive ISS of agile projects in the software industry. The following subsections present the 11 possible factors along with their source articles.

A. Effective Internal Communication

Agile projects place a strong emphasis on transparent and frequent communication within the internal project team (Huijgens et al., 2017). Team members can comprehend the project status, express their concerns, and provide feedback through regular meetings, clear documentation, and open communication channels (Prasad et al., 2018).

B. Maintain Better Communication Among Customers

Regular demonstrations, feedback sessions, and opportunities for customer involvement ensure that their perspectives are considered, allowing internal stakeholders to ensure that customer requirements are integrated into the software development process correctly (Dragos, 2021; Huijgens et al., 2017; Kanski et al., 2023; Prasad et al., 2018).

C. Frequent Feedback from Customers

Customer feedback has assisted in validating and improving the product, ensuring that it meets their requirements and increases their satisfaction (Bambauer-Sachse & Helbling, 2021; Kanski et al., 2023; Prasad et al., 2018; Tam et al., 2020).

D. Iterative Development

Agile projects emphasise iterative development, delivering incremental value to stakeholders through regular releases or iterations (Drury-Grogan, 2014). Observing tangible outcomes and having project requirements met quickly increased ISS (Siddique & Hussein, 2016). Additionally, it raised the visibility of the project and its resources (Anand & Dinakaran, 2017; Žužek et al., 2020).

E. Collaboration

Agile methodologies promoted stakeholder engagement and collaboration throughout the development process (Drury-Grogan, 2014; Siddique & Hussein, 2016). Encouraging

internal stakeholders to participate in planning, prioritization, and decision-making processes led to a better understanding of their needs and expectations (Chang et al., 2015; Huck-Fries et al., 2023).

F. Flexibility to Adapt Customers' Late Changes

Agile projects facilitated to be flexible and adaptable to change. Customers appreciated the ability to respond to evolving requirements, market conditions, and emerging priorities (Serrador & Pinto, 2015). Agile methodology's iterative nature enabled course corrections and modifications, which raised ISS (Anand & Dinakaran, 2017; Drury-Grogan, 2014; Žužek et al., 2020).

G. Agile Teams Rotate Roles and Share Leadership Across the Team

Agile projects supported autonomous and self-organizing development teams (Drury-Grogan, 2014). Teams that are authorized to make decisions and feel a sense of ownership were more likely to meet the requirements of stakeholders and provide value effectively, which ultimately increased ISS (Kanski et al., 2023; Žužek et al., 2020).

H. Delivery Strategy

A transparent and collaborative delivery strategy ensured the timely and consistent delivery of valuable increments. Effective prioritization and regular feedback loops enhanced the likelihood of meeting project expectations, enabling internal stakeholders to provide input and influence the project's direction (Binder et al., 2014).

I. Shared Vision

A shared vision in agile projects enhances success by aligning the team's goals and objectives, promoting collaboration, and understanding among internal stakeholders (Serrador & Pinto, 2015). It ensured that everyone is working towards a common goal, leading to improved project outcomes, and increased internal stakeholder engagement (Dragos, 2021).

J. Keeping Up with Budget

Agile projects ensured that the project was completed within the allocated resources by adhering to the budget. Additionally, it improved ISS by demonstrating effective financial management and delivering value in a cost-effective manner (Kanski et al., 2023; Tsoy & Staples, 2021).

K. Organizational Culture

The dynamic culture of an organization promotes the ability to respond to frequent changes during the agile development life cycle. Therefore, it was a vital factor in enhancing ISS (Koggalahewa & Abeysekara, 2022; Tsoy & Staples, 2021).

Next, two industry experts were contacted separately to find out whether they were willing to attend a formal interview to identify the most appropriate factors that would drive the ISS of agile projects in the Sri Lankan software industry context according to their experience and knowledge. One of the industry experts is a senior project manager with over 10 years of experience in the Sri Lankan software industry. He has successfully contributed to several agile projects conducted by his company. The other expert serves as a Scrum Master and a senior software engineer, boasting more than 8 years of experience in the Sri Lankan software industry. He, too, has played a key role

in numerous successfully completed agile projects. Both are working in two different software companies situated in the Colombo district of Sri Lanka, where over 500 employees work.

Once the approval was received, the researchers arranged two-hour-long meetings with each of them. In the meeting, the researchers first explained the process we wished to carry out during the interview. According to the outlined process, the researchers initially introduced a practice derived from the literature review and provided a corresponding description. Then, the researchers asked experts to provide further elaboration on the most important practices adopted by the agile projects in which they participated and satisfied internal stakeholders. Ultimately, the experts came up with five factors that contribute to the ISS of agile projects in the Sri Lankan software industry.

Those factors were communication among internal stakeholders, frequent feedback from customers, iterative development, collaboration, and flexibility to adapt customers' late changes. Further, experts highlighted that 'trust' is a mediating variable between ISS and maintaining better communication among internal stakeholders. The following subsections present a detailed discussion of each practice and the benefits that each practice offers in satisfying the internal stakeholders of an agile project.

L. Communication Among Internal Stakeholders

Maintaining better communication among internal stakeholders allowed to promote transparency and self-organizing teams (Bianchi et al., 2020; Kanski et al., 2023). Further, it allowed for knowledge sharing among team members and helped during the decision-making process by identifying the consequences of each (Alzoubi et al., 2018).

Industry experts also emphasized the importance of retrospective meetings, as it contributes to enhanced team satisfaction by facilitating quicker communication of information, including project objectives and lessons learned from the last sprint. Huijgens et al. (2017) and Drury-Grogan (2014) similarly highlighted that maintaining healthy communication among team members leads to an improvement in ISS, as it facilitates information sharing and interaction among internal stakeholders. Accordingly, the hypothesis is;

H1: Communication among internal stakeholders has a positive impact on ISS.

M. Trust Between Communication Among Internal Stakeholders and ISS

Trust can be defined as the state that accepts liability. Thus, positive expectations will emerge through trust (Haider & Kayani, 2021; Majeed et al., 2021). Industry experts identified that trust plays a crucial role in facilitating the sharing of knowledge, information, and resources. Because it enhanced the level of benefits among team members by boosting capability, reliability, and goodwill.

According to Ning (2017), trust aided in assessing risks, serving as a safeguard to achieve high levels of ISS and project performance. When team members effectively communicate knowledge, it leads to improve operations and functions within the project team, thereby enhancing the overall quality of the team (Booth et al., 2020).

As per Haider & Kayani (2021), reliable communication enhances knowledge sharing among internal stakeholders. This, in turn, contributes to improved team performance by creating an open platform for increased interaction. They also highlighted that trustworthy communication facilitated the sharing of additional information related to challenges, leading to collaborative problem-solving, which contributed to improving

ISS. Henderson et al. (2016) further showed in their research that when project stakeholders possess all the required knowledge and information from reliable sources, ISS increases, by achieving project goals and success of the project. Hence, the hypotheses are;

H2: There is a relationship between communication among internal stakeholders and trust.

H3: There is a relationship between maintaining trust and ISS.

H4: Trust mediates the relationship between communication among internal stakeholders and ISS.

N. Frequent Feedback from Customers

Frequent feedback from customers has been recognized as one of the agile principles (Tam et al., 2020). According to industry professionals, it is essential to receive early and frequent feedback to develop the best possible solution while eliminating last-minute surprises. Kanski et al. (2023) further supported this by stating that frequent feedback strengthens relationships between customers and internal stakeholders.

This improved relationship leads to open communication, enabling customers to suggest changes before finalization. As a result, project transparency increases, as mentioned by Bambauer-Sachse and Helbling (2021), which is essential for managing project expectations and ensuring that the project aligns with customer needs.

Additionally, Prasad et al. (2018) identified that frequent feedback helps development teams identify errors and understand customer perceptions early in the project lifecycle. This early error identification ensures that the project stays on track and meets customer expectations, ultimately enhancing ISS by improving the accuracy and relevance of the implemented features. In conclusion, frequent customer feedback strengthens communication, improves project transparency, and allows for early issue resolution, all of which contribute to enhancing ISS. Accordingly, the hypothesis is;

H5: Frequent customer feedback has a positive impact on ISS.

O. Iterative Development

Edeki (2015) noted that agile teams implement projects in small, iterative increments, which allows them to adapt quickly to changing customer needs. This responsiveness is crucial for ensuring the delivery of working software with measurable business benefits at each iteration (Kanski et al.,2023). Drury-Grogan (2014) also emphasized that iterative cycles provide teams with the opportunity to reflect, assess progress, and identify areas for improvement, enhancing the overall development process.

Additionally, Edeki (2015) argued that iterative development simplifies project time estimation and risk mitigation. As he mentioned, the iterative approach also allows project managers to monitor progress more effectively, ensuring that the project aligns with the expected schedule. Moreover, industry experts found that iterative development aids internal stakeholders in adjusting priorities as needed, improving flexibility throughout the software development process. Accordingly, the hypothesis is;

H6: Iterative development has a positive impact on ISS.

P. Collaboration

Kanski et al. (2023) highlighted collaboration as a core feature of the agile project management approach, suggesting that it facilitates teamwork towards a common goal. Dragos (2021) argued that collaboration enables stakeholders to actively participate in decision-making and problem-solving. Furthermore, he mentioned that collaboration among internal stakeholders has enabled them to contribute their desires, advancing both the process and the final product, and leading to a positive outcome. Moreover, Tam et al. (2020) revealed that collaboration reduces project risk by identifying and managing future resistance. Accordingly, the hypothesis is;

H7: Collaboration has a positive impact on ISS.

### Q. Flexibility to adopt customers' late changes

According to industry experts, many projects commence with an incomplete understanding of customer needs and proper use of technologies. This understanding may evolve during the project's duration. Therefore, the capacity to promptly adapt plans and scope in response to unforeseen and changing requirements is crucial for optimizing ISS (Chang et al., 2015).

Furthermore, the study by Olsson (2006) showed a strong relationship between the ISS and project flexibility as it leads to successful project completion. Moreover, the end users felt more comfortable with the implementation which accommodate late changes, that in turn caused the ISS. As specified by Edeki (2015), any late change may be considered as a major change, because it obviously differs from classical one-shot software development models. As a result, ISS has increased as it leads to achieving customers' exact requirements mainly in the American and European software industry contexts (Edeki, 2015; Hawajreh et al., 2014). Accordingly, the hypothesis is;

H8: Flexibility to adapt customers' late changes has a positive impact on ISS.

Based on the above eight hypotheses, the authors developed the conceptual framework as in Figure 2.

Figure 2. Conceptual Framework
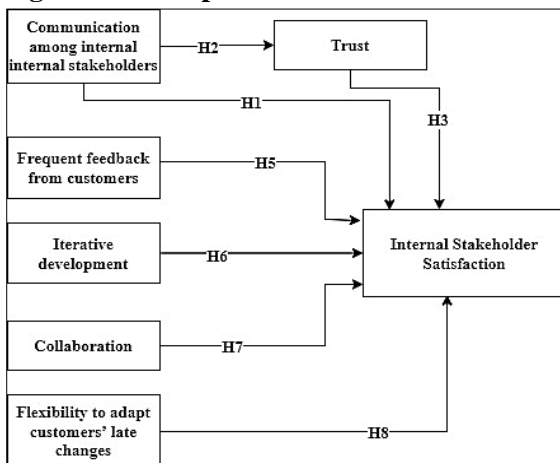
Source: Authors' compilation.

III. METHODOLOGY

A. Methodology

A survey questionnaire was used along with quantitative methodology to assess the constructs depicted in the conceptual framework (Figure 2) to investigate the research hypotheses. Following the process recommended by Teo et al. (2003), initially, a pilot test was conducted to tailor the questionnaire to the study's context. Subsequently, a convenience sample of 137 individuals, employed as internal stakeholders in agile projects within the Sri Lankan software industry, participated in the survey as part of the main study.

B. Pilot Test

Seven individuals who served as internal stakeholders in agile projects within the Sri Lankan software industry participated in a preliminary test of the developed survey tool. Following the methodology outlined in Teo et al. (2003), we solicited their feedback regarding the wording, arrangement, flow, and overall comprehensibility of the questionnaire items. Based on the collective feedback from these seven participants, a screening question was added to determine whether respondents had experience working in agile projects within the software industry. Afterwards, ten industry experts actively engaged in agile projects within the Sri Lankan software industry, assessed the revised questionnaire to determine readability, comprehensibility, and clarity. Following this evaluation, we made a few minor adjustments to enhance the organization and language of specific items.

C. Sample

Based on information provided by a senior manager at SLASSCOM and relevant statistics, approximately 56,000 individuals are actively involved as internal stakeholders in agile projects within the Sri Lankan software industry, which represented the target population for this study. By using Cohen's table (Cohen, 2013), it was determined that a sample size of 137 individuals would be necessary to ensure reliable results.

To collect data, the researchers developed a questionnaire using Google Forms and distributed it to 187 internal stakeholders employed in the Sri Lankan software industry. The researchers did not provide any form of compensation to participants for their participation. Despite the widespread adoption of agile methodology in Sri Lankan software projects, we included a screening question to verify each participant's experience working within the agile framework. Next in the data-gathering phase, we received 144 responses, representing a 77% response rate. After removing seven unengaged responses, a total of 137 responses remained for subsequent data analysis.

D. Research Instruments

The proposed theoretical model consists of seven factors evaluated through a total of 32 items. To ensure content validity, we adapted question items from previous research. This study measured communication among internal stakeholders using five items (Majeed et al., 2021; Roberts et al., 2004) trust using four items (Podsakoff et al.,1990), feedback from customers using five items (Yang et al.,2004), iterative development using five items (So & Scholl, 2009), collaboration using four items (Grier, 2020) and flexibility to adapt customers' late changes using four items (St-Laurent et al.,2022). We adjusted these

metrics to align with the study's context. Finally, we utilized five items from Varajão and Trigo (2016) and modified them accordingly to measure the dependent variable ISS.

While some original measurements employed a seven-point Likert scale, the authors of Mathieu et al. (2017) argued that the difference between seven- and five-point datasets is insignificant. Additionally, Revilla et al. (2014) proposed that employing a five-point scale in research instruments yield more advantages compared to choosing an 11 or seven-point scale. Consequently, the researchers assessed each construct using a five-point Likert scale, ranging from "1 (strongly disagree)" to "5 (strongly agree)".

E. Demographic Data Analysis and Hypothesis Testing
The researchers initiated their analysis by reviewing demographic data to evaluate the representativeness of the sample. This process involved assessing details such as respondents' gender, their role in agile projects, the staff strength of the organization, and the number of years the respondents' organizations have been present in the software industry. The study utilized IBM SPSS Statistics software to analyse the dataset.

Upon evaluating the normality of the data, the authors identified that a majority of it did not adhere to a normal distribution. In such instances, Hair et al. (2012), and Henseler et al. (2009) suggested to use partial least squares structural equation modelling (PLS-SEM) for hypothesis testing. PLS-SEM is especially suitable when data deviate from normal distribution assumptions (Dilhara et al., 2024; Fathima et al., 2024; Hensman et al., 2024; Thasipan et al., 2024; Wijesinghe et al., 2024). Thus, the authors chose the PLS-SEM for the hypotheses testing.
The process of hypotheses testing using PLS-SEM consists of three stages.

- Testing the reflective measurement model.
- Testing the formative measurement model.
- Testing the structural model.

As all the measurement scales utilized in this study are reflective constructs, there was no requirement to assess the formative measurement model. Thus, the authors concentrated on assessing both the reflective measurement model and the structural model to examine the hypotheses. To accomplish this, we used the SmartPLS software package.

F. Common Method Bias (CMB)
Previous research pointed out the importance of addressing common method bias (CMB) when analysing data for research on agile practices (Ferreira & Cohen, 2008). Kock and Hadaya (2018) recommended utilizing PLS-SEM to identify CMV in a dataset. According to Kock and Hadaya (2018) (p. 253), "if all VIFs resulting from a full collinearity test are equal to or lower than 3.3, the model can be considered free of common method bias." The researchers applied this criterion and determined that none of the constructs exhibited VIF values exceeding 3.3. Consequently, we concluded that CMB did not impact this study.

IV. DATA ANALYSIS AND DISCUSSION

A. Demographic Profile of Respondents
This section provides an overview of the demographic characteristics of the respondents.

As previously mentioned, the sample of the study comprised a total of 137 respondents. Among them, 79 were male, constituting 57.6% of the sample, while 58 were female, representing 42.3%.

Regarding the job roles of respondents in agile projects, 54 individuals were software engineers, accounting for 39.4% of the sample, while 32 responses came from business analysts (BAs), comprising 23.3%. 12 respondents were software quality assurance (QA) professionals, representing 8.75%. Additionally, 12 respondents were software project managers, making up 8.75%, and 3 respondents worked as UI/UX engineers, accounting for 2.1%. The remaining 24 respondents (17.5%) held various other roles such as scrum master, data engineer, etc.

Regarding the staff strength of the organization, 36 respondents (28.4%) indicated that 0-50 staff were working in the organization that they were employed in, while 24 were working in organizations where staff strength ranged from 50-150, making up 17% of the total sample. 10 (7.1%) and 34 (24.1%) respondents were employed in organizations where staff strength ranged from 150 to 250 and 250 to 500, respectively. The remaining 33 participants were working in organizations where staff strength exceeds 500, representing 23.4% of the sample.

B. Analysis of the Outer Model

When assessing the outer model, the authors first conducted a composite reliability analysis, following the guidance provided by Hair et al. (2012) and Henseler et al. (2009). The analysis revealed that the reliability of all the constructs in this study have composite reliability values over 0.6. Consequently, we could determine that all constructs met the criterion for composite reliability.

Then, the authors measured indicator reliability. Hair et al. (2012) and Henseler et al. (2009) evaluated the reliability of indicators by analysing the outer loadings of each item in the outer model. We removed items with outer loadings less than 0.6 (only one item from stakeholder satisfaction), based on the suggestion of Hulland (1999). Then we evaluated the statistical significance of each remaining item using the bootstrapping option in SmartPLS version 4. The analysis indicated that all remaining items were statistically significant ($p < 0.001$).

Consequently, the authors evaluated convergent validity. The authors utilized average variance extracted (AVE) to assess convergent validity following the recommendations of Fornell and Larcker's (1981). We found that none of the constructs had AVE values lower than 0.5, indicating that the outer model met the requirements for convergent validity.

Finally, the researchers established discriminant validity to conclude the outer model analysis. This process involved two distinct approaches. Firstly, we did an assessment of cross-loadings, revealing that the outer loadings of each indicator on its respective construct were higher than those on any other constructs, while confirming the discriminant validity. Then we conducted a comparison between the square root of the average variance extracted (AVE) and the intercorrelations among constructs. Through that we found that, the square root of the AVE for all constructs exceeded the inter-construct correlations, providing further support for establishing discriminant validity, as advocated by Fornell and Larcker (1981).

Table 2 presents a comprehensive overview of the reflective measurement model analysis. Further, it shows the outcomes of the discriminant validity assessment with the Fornell and Larcker criterion.

C. Analysis of the Inner Model

The researchers initiated the analysis of the inner model by estimating the path coefficients. The authors considered the sign, magnitude, and significance of the path coefficients in estimating them. We used the boot-strapping feature of SmartPLS version 4 to evaluate the significance of each path coefficient.

After analysing the inner model, we determined that the three relationships proposed in the hypotheses were not significant. The assessment of path coefficients revealed that there is no relationship between the dependent variable ISS and the independent variables communication among internal stakeholders, customer feedback, flexibility to adapt to customers' late changes. This is because, all three relationships had significance values greater than 0.05, leading to the rejection of H1, H5, and H8. Furthermore, we had to reject H1 due to the negative path coefficient value (-0.1) observed between communication among internal stakeholders and ISS. On the positive side, both collaboration ($\beta=0.342$, $p<0.05$) and iterative development ($\beta=0.317$, $p<0.006$) have a positive impact on ISS. Thus, leading to the acceptance of H6 and H7. Although communication among internal stakeholders does not directly affect ISS ($\beta=-0.1$, $p>0.05$), it has a positive impact on trust ($\beta=0.676$, $p<0.05$). Trust, in turn, has a positive impact on ISS ($\beta=0.26$, $p<0.05$). Therefore, H4 is accepted.

Table 2. Results of the Analysis of the Reflective Measurement Model

Construct	Indicator	Composite reliability	AVE	Outer loading	P-Value
Communication among internal stakeholders (Com)	Com 1			0.808	0.000
	Com 2			0.872	0.000
	Com 3	0.852	0.612	0.823	0.000
	Com 4			0.613	0.000
	Com 5			0.771	0.000
Trust (Tru)	Tru 1			0.807	0.000
	Tru 2			0.776	0.000
	Tru 3	0.772	0.585	0.819	0.000
	Tru 4			0.647	0.000
Frequent feedback from customers (Fre)	Fre 1			0.780	0.000
	Fre 2			0.745	0.000
	Fre 3	0.835	0.596	0.791	0.000
	Fre 4			0.771	0.000
	Fre 5			0.774	0.000
Iterative development (Ite)	Ite 1			0.773	0.000
	Ite 2			0.695	0.000
	Ite 3	0.819	0.574	0.837	0.000
	Ite 4			0.700	0.000
	Ite 5			0.775	0.000
Collaboration (Col)	Col 1			0.777	0.000
	Col 2			0.704	0.000
	Col 3	0.779	0.590	0.817	0.000
	Col 4			0.770	0.000

Construct	Indicator	Composite reliability	AVE	Outer loading	P-Value
Flexibility to adapt customers' late changes (Flex)	Flex 1	0.841	0.668	0.799	0.000
	Flex 2			0.836	0.000
	Flex 3			0.814	0.000
	Flex 4			0.821	0.000
Internal stakeholder satisfaction (ISS)	ISS 1	0.796	0.611	0.695	0.000
	ISS 2			0.789	0.000
	ISS 3			0.823	0.000
	ISS 4			0.812	0.000

Source: Authors' compilation.

As per Huang and Pan (2016), to establish the presence of a mediation effect, the T-value must exceed 1.96, the P-value should be less than 0.05, and the 95% confidence interval should not include 0. Based on the mediation effect analysis, the path coefficients between communication among internal stakeholders and trust (0.677), and trust and ISS (0.481) demonstrate positive values. Furthermore, both relationships are significant, and their 95% confidence intervals fall on the positive side.

However, the association between communication among internal stakeholders and ISS is not significant, and the 95% confidence interval does not entirely fall on either the positive or negative side. This implies that trust serves as a complete mediator in the association between ISS and internal stakeholder communication. Hence, hypothesis H4 was accepted, and the rejection of hypothesis H1 was further supported. Table 3 illustrates a summary of hypotheses that were accepted and those that were rejected.

Table 3. Summary of the Hypothesis Testing

Relationship	Hypotheses	Path coefficient	P-Value	Accepted/ rejected
Communication -> ISS	H1	-0.1	0.304	Rejected
Communication -> Trust	H2	0.676	0	Accepted
Trust -> ISS	H3	0.26	0.006	Accepted
Communication -> Trust -> ISS	H4	-	-	Accepted
Customer feedback -> ISS	H5	0.105	0.204	Rejected
Iterative development -> ISS	H6	0.317	0.008	Accepted
Collaboration -> ISS	H7	0.342	0.005	Accepted
Flexibility -> ISS	H8	0.014	0.892	Rejected

Source: Authors' compilation.

After determining the path coefficients, the authors assessed the coefficient of determination (R^2) values for each endogenous latent variable (Hair et al., 2012; Henseler et al., 2009). According to Chin (1998), an R^2 value exceeding 0.26 signifies reliable predictive power. In this research, the endogenous latent variables trust ($R^2 = 0.459$), and ISS ($R^2 = 0.613$) exhibited R^2 values greater than 0.26, indicating reliable predictive power.

Next, the authors calculated the effect size ($f2$) of each predictor latent variable in the inner model. According to Henseler et al. (2009), three categories of effects can be defined based on the value of the effect size ($f2$): small ($0.02 < f2 < 0.15$), medium (0.15

< f2 < 0.35), and strong (f2 > 0.35) effects. Collaboration exhibited a medium effect on the ISS (f2 = 0.197). Conversely, both iterative development (f2 = 0.113) and communication among internal stakeholders through trust (f2 = 0.095) demonstrated a small effect on the ISS.

Ultimately, the authors conducted cross-validation to conclude the analysis of the inner model. A positive value for cross-validation indicates a significant predictive ability of the proposed conceptual model (Henseler et al., 2009). Adopting the PLSpredict tool in SmartPLS version, the authors determined the cross-validation values. Following the recommendation of Hair et al. (2012), the authors set the number of folds to 10 and executed the PLSpredict algorithm once. Consequently, we observed that all cross-validation values surpassed zero, thereby meeting the final criterion for the analysis of the inner model.

Based on the literature, the researchers considered communication among internal stakeholders, frequent customer feedback, iterative development, collaboration, and flexibility to adopt customers' late changes as the factors that impact the ISS. Also, we considered trust as a mediator between communication and ISS. We collected data from 137 respondents.

According to the analysis, iterative development has a positive impact on ISS (β=0.317, p<0.006). Ferreira and Cohen (2008) have also demonstrated a similar result between iterative development and ISS in the study they conducted in the South African software industry context.

Further, collaboration positively impact the ISS in Sri Lanka software industry (β=0.342, p<0.05).

As per the study, trust mediates the relationship between communication among internal stakeholders and ISS, showing that trustworthy communication positively influences ISS. Similarly, Ling and Guo (2020) and Ning (2017) found that trustworthy communication in the software industry context serves as a safeguard, allowing for better risk assessment and ultimately improving both ISS and overall project performance. This connection between trust and ISS is especially relevant in the Sri Lankan software industry, where fostering reliable communication channels is crucial for success.

Majeed et al. (2021) and Booth et al. (2020) argued that trust plays a crucial role in facilitating the sharing of knowledge, information, and resources. When the project's internal stakeholders possess all the required knowledge and information reliably, their satisfaction increases, which enables them to achieve goals and succeed in the project (Henderson et al., 2016; Mathieu et al., 2017). Thus, the results support the notion that trust-based communication among internal stakeholders is a key contributor to improving ISS, particularly in the Sri Lankan software industry. The importance of fostering trust to ensure that communication leads to tangible, actionable outputs, rather than merely functioning as a routine, is critical for the success of Agile projects.

However, the results of the study indicated that frequent customer feedback does not have a significant impact on ISS in Sri Lanka. This is because, even though customer feedback is intended to improve product alignment with user needs (Hawajreh et al., 2014), the frequent changes resulting from this feedback can significantly alter the project's scope. This creates a discrepancy between the initial project plan and the final output, which can lead to dissatisfaction among internal stakeholders (Vithana et al., 2015). However, it is important to note that existing research, conducted in developed Western countries, often treats feedback from customers and flexibility as distinct elements from iterative development (Kanski et al., 2023; Tam et al., 2020). Another

finding of this research is that flexibility to adapt to customers' late changes have no impact on ISS in the agile projects of the Sri Lankan software industry.

V. CONCLUSION AND RECOMMENDATIONS

This study focuses on the critical issue of poor internal stakeholder satisfaction (ISS) in Agile projects within the Sri Lankan software industry, filling a significant gap in the existing literature. While much of the research on Agile projects has traditionally focused on overall project success, this study shifts the focus to ISS specifically in the local context—a vital yet often overlooked factor influencing long-term project outcomes.

By conducting a systematic literature review, this study identified eleven possible factors that influence ISS in Agile projects. In-depth discussions with industry experts refined these into the five most appropriate factors specific to the Sri Lankan software industry context. The five practices were internal stakeholder communication, frequent customer feedback, iterative development, collaboration, and flexibility to adapt to customers' late changes. Importantly, 'trust' was identified as a mediating factor in the relationship between communication and ISS.

The data analysis revealed that trustworthy communication among internal stakeholders, iterative development, and collaboration significantly enhance ISS. In contrast, mere communication among internal stakeholders, accommodating frequent feedback, and maintaining flexibility for late changes did not have a strong impact on ISS in the Sri Lankan context. These findings suggested a misalignment between certain Agile practices and the realities of the local context, highlighting the need to improve and adapt Agile methodologies to enhance ISS.

To position in the broader academic context, this research offers a fresh perspective by emphasizing ISS over general project success, responding to a gap in research that has primarily focused on the latter. Further, the findings contributed to the limited literature on Agile practices in developing countries, specifically in the Sri Lankan software industry, where economic challenges present unique constraints. The insights generated here provide valuable guidance for practitioners and future researchers, offering actionable recommendations for enhancing ISS and project success indirectly.

As a final remark, the study bridges the gap between theory and practice by addressing the individual challenges faced in Agile projects in Sri Lanka. As the software industry continues to evolve, the findings offer a pathway for refining Agile practices to enhance ISS, positioning this research as a critical contribution to both theoretical discourse and practical implementation.

VI. LIMITATIONS AND FUTURE WORK

The following section discusses the implications of the proposed factors, limitations of the study, and suggestions for future research. The first implication of this study, based on discussions with industry experts, is that satisfying internal stakeholders of an agile project is a challenging task in the current Sri Lankan context. Thus, full adoption of all eleven possible factors found through the literature review was not initially possible.

The second implication drawn from the discussion with industry experts is that feedback from customers and flexibility are embedded into iterative development within the current Sri Lankan context (Koggalahewa & Abeysekara, 2022). However, in the Sri Lankan context, these Agile principles face limitations due to economic pressures (Koggalahewa & Abeysekara, 2022). The ongoing economic crisis has led to budget constraints, making it difficult to continuously integrate customer feedback and

accommodate changing requirements. Thus, this research findings clearly show the gap between the theoretical principles of Agile practices and the practical realities within the Sri Lankan context.

Another implication identified in the data analysis is that the lack of trust compromises the delivery of actionable outputs, directly impacting ISS. Haider & Kayani (2021) emphasize the critical role of trust in fostering effective communication and ensuring project success. Without trust, communication alone, even in numerous meetings as highlighted by Drury-Grogan (2014) and Huijgens et al. (2017), does not guarantee successful project outcomes or ISS. This supports the idea that regular communication among internal stakeholders, while necessary, is insufficient in driving ISS when trust is absent.

To get a large contribution from those factors to further improve ISS, the authors of Kanski et al. (2023) suggest that it is required to invest in user testing to involve customers in the early stages of development. Kanski et al. (2023) highlighted that software companies can use interactive prototypes to simulate the user experience and gather feedback from customers before the actual development phase. Furthermore, software companies in Sweden incorporate frequent feedback loops through regular retrospectives and continuous integration as it streamlines the process of interacting with late changes and delivering updates rapidly. This leads to involving customers in the development lifecycle and iterating quickly based on customer feedback (Davis, 2018). If these practices can be adopted in the Sri Lankan software industry, ISS will improve further.

European software companies that adopt agile methodologies clearly communicate the implications of late changes with customers and internal stakeholders as well. This ensures that everyone on the project team shares similar expectations or interpretations regarding the final project goals (Al Hawajreh et al., 2014). Additionally, the Sri Lankan software industry can adopt the practice of establishing a robust change management process to assess the impact of late changes on perspectives related to the project timeline, budget, and overall development strategy (Huijgens et al., 2017). Thus, integrating these practices into agile projects in the Sri Lankan software industry can further enhance ISS.

Despite the discussions on theoretical and practical implications mentioned above, this study is constrained by several limitations. Firstly, the selection of the most appropriate factors that affect ISS relied on the experiences of only two industry experts who use agile project management methodologies, and this is due to time constraints and limited expert availability. It is a major limitation of the study. This limits the generalizability of the findings, but it may still be applicable in similar contexts. Nevertheless, it is crucial to acknowledge the dynamic nature of agile projects and the need for adaptability in selecting practices tailored to specific projects.

Secondly, this study only focused on factors that drive ISS of agile projects in the initial stage. However, other antecedents such as test-driven design, organizational culture, and keeping up with the budget which can maximize ISS (Bergmann & Karwowski, 2019; Dragos, 2021) were not explored in this study as they were not within the selected scope.

Finally, during the systematic literature review, we used only Google Scholar and IEEExplore databases based on the recommendations of other researchers (Huijgens et al., 2017). However, Bambauer-Sachse & Helbling (2021) and Siddique & Hussein (2016) recommended to use other popular databases such as ACM, Web of Science, and Scopus

too. If authors used other databases, they could have extracted additional papers for a systematic literature review.

Future researchers can address the limitations mentioned above. Additionally, by utilizing the list of possible factors identified during the initial literature review, they could explore drivers that may be applicable in other contexts. Finally, future researchers could conduct studies to empirically test the antecedents of external stakeholder satisfaction of agile projects in the software industry.

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