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Perceptions of adapting to agile quality assurance practices in IT project

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Abstract

In the current Sri Lankan Information Technology (IT) industry, adapting software development methodologies to effectively satisfy customer requirements within constrained schedules and budgets has appeared as a paramount topic. As a consequence, Agile software development practices are now being adopted by many IT organizations. In this paper, we analyzed the QA proportions of Agile implementations in particular, as an immediate organizational challenge for a target entity ("Company AB"), which has suffered from high rates of project failure, despite adopting the core Agile development principles. A validated questionnaire was distributed across three selected IT companies in Sri Lanka. Data were gathered from cross-functional software professionals. Statistical relationships were assessed using Spearman's Correlation Coefficient in SPSS. The analytical results show that all six identified Agile QA practices possess positive correlations with software project effectiveness. Maintaining an Agile Testing Mindset displayed a strong positive relationship ($r=0.737$, $p < 0.001$), whereas Test Automation and customer collaboration displayed weak positive relationships, signaling areas requiring broader implementation. Based on these findings, programmatic recommendations are provided for Company AB to successfully institute a whole-team approach and structured Exploratory Testing to aid in sustained optimization.

Keywords: Agile methodologies, Agile testing mindset, quality assurance, software project effectiveness, test automation, whole team approach

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Introduction

The current Sri Lankan Information Technology (IT) sector comprises various domestic and multinational organizations providing high-velocity computing solutions. These entities heavily depend on the rigid, linear sequential waterfall framework. However, due to systemic high project failure rates driven by late-stage scope inflation and customer dissatisfaction, software professionals have steadily moved to iterative practices. Agile software engineering models serve as a standard mechanism for maintaining organizational flexibility amid highly volatile project requirements. Most software companies in the region have now integrated or are scaling these processes to operate sustainably in competitive environments.

The core work context of this study centers upon Company AB, a United States-based engineering enterprise whose flagship Research and Development (R&D) hub is operational in Sri Lanka. The entire software delivery life cycle, spanning from initial requirements engineering to ultimate user validation, is exclusively managed at the Sri Lankan office. Although Company AB successfully applied fundamental Agile sprint configurations, it experienced continuous project regressions. Structural analysis revealed a disconnect within the organization: the core developer base was following iterative processes while Quality Assurance was unable to proceed in a siloed waterfall verification model, disrupting the validation cycle. The basis of continuous quality models is teamwork, as can be seen in the traditional software engineering literature approach to software projects. Cohn (2010) explicitly states that functional tasks should be seen as collective work ("our work") and not as individual work ("my or your work") in iterative frameworks.

Crispin & Gregory (2009) build on this concept through the Whole Team Approach, showing that set testers embedded within product feature cells with training resources are required to absorb the rapid pace of operational demands of agile workflows. This structural cross-pollination creates cross-functional collaboration and trust (Watkins, 2009). Furthermore, engineers should have the Agile Testing Mindset: a proactive and self-directed attitude to find edge cases early (Stamelos & Sfetsos, 2007).

Continuous feedback approaches, powered by automated regression frameworks and early client integration, maintain systemic track visibility. Conversely, the absence of test automation pipelines forces QA members to spend extensive cycles performing manual verification. This significantly reduces the time available for exploratory testing activities, which are essential for uncovering deep-rooted software vulnerabilities (Crispin & Gregory, 2009).

Methodology

This study utilized a quantitative cross-sectional research design. To obtain a representative industry sample, three distinct software development enterprises operating in Sri Lanka were targeted, recording both highly evolved agile matrix environments and mixed-methodology environments. Stratified random sampling was implemented to prevent structural selection bias across the organizations. With an established industry population boundary, the targeted sample size was calculated as sixty-five (n = 65) to achieve a 95% confidence level and a 5% margin of

error. To safeguard data collection sufficiency as opposed to incomplete returns, seventy-seven (77) questionnaires were distributed.

The primary survey implemented consisted of scaled questions measuring key agile validation parameters. The cross-functional sample included Quality Assurance Engineers, Scrum Masters, Tech Leads, and Software Engineers. Content validity was established via a panel review of senior project managers to confirm clear alignment between variable metrics and operational indicators. Statistical analyses were conducted using SPSS software utilizing Spearman's Correlation Coefficient tests, which are appropriate for analyzing ordinal data.

During data collection, human subject protection protocols were fully enforced. All respondents were presented with an Informed Consent Statement before data collection, ensuring voluntary participation and absolute data anonymization. No proprietary corporate repositories or individual identifying records were collected, ensuring full adherence to international research publishing ethics and institutional guidelines.

Data Analysis Methods

Demographic data indicated that 71.4% of the industry respondents belonged to the 20–30 age group, with 48.1% specifically working in Software Quality Engineering departments. Most respondents (57.1%) had 1–5 years of IT industry experience. The collected data was analyzed to examine correlations between the six Agile QA practices and Software Project Effectiveness (SPE). Software Project Effectiveness (SPE). The values are summarized in Table 1 below.

Table 1: Values are summarized

Constructed Statistical Hypothesis	Spearman's Rho	Degree of Relationship	P-value
H_1: Whole Team Approach has a positive impact on SPE	0.49	Moderately Positive	< 0.001
H_2: Agile Testing Mindset has a positive impact on SPE	0.75	Strongly Positive	< 0.001
H_3: Big Picture Approach has a positive impact on SPE	0.45	Moderately Positive	< 0.001
H_4: Feedback Approach has a positive impact on SPE	0.44	Moderately Positive	< 0.001
H_5: Customer Collaboration has a positive impact on SPE	0.31	Weak Positive	0.01
H_6: Test Automation has a positive impact on SPE	0.31	Weak Positive	0.01

The statistical metrics confirm that all the null hypotheses corresponding to H1–H6 were rejected at the 0.01 significance level. Every evaluated agile QA practice exhibited a statistically validated positive relationship with project success metrics. Most notably, an Agile Testing Mindset submitted a strong positive correlation (r=0.737), proving that proactive team attributes heavily dictate final software output stability. Conversely, Customer Collaboration (0.309) and Test Automation (0.307) displayed weak positive bounds. This weaker relationship does not signify a lack of architectural importance, but reflects low baseline industry deployment: nearly 20% of

respondents 4 explicitly noted an absence of automated regression runs within their engineering cells, suppressing the correlation metric.

Results

Survey responses

77 questionnaires were distributed among the three companies according to the sample proportions calculations.

Whole Team Approach

Table 2: Response count for agile testing mindset

	Extremely Negative	Not at all	Slightly	Moderately	Quite a bit	Almost Totally	Extremely Positive
Q5	3.90%	3	4	17	13	40	51.95%
Q6	2.59%	2	9	29	18	19	77.68%
Q7	5.19%	4	12	20	15	26	33.77%
Q8	2.59%	2	15	23	22	15	19.48%

According to Q5, which was asked to measure QA engineers' involvement with software developers for testing tasks, 3.90% of extremely negative answers were received. Hence, the results suggest that testers in the selected sample set are having at least slight involvement with software developers for testing tasks. According to Table 2, only 3% of the responders agreed that their organization does not use agile communication methods within their project teams. This indicates that more than 90% of the respondents agreed that they use agile-related communication methods for knowledge sharing and communication. When asked whether software developers in the organization use unit testing Q7 while coding, only 5% of the respondents reported that unit testing was not used. This implies that the majority of the respondents confirmed the usage of unit tests while coding in their respective organizations. Furthermore, as shown in Table 2, more than 97% of respondents indicated that developers are at least slightly involved in testing activities within their respective organizations. However, for Q8, approximately 3% of respondents reported that software developers are not involved in testing tasks.

In summary, the findings indicate that the measurements of QA engineers' involvement in two measurements of whole team approach demonstrated positive outcomes from the collected sample data set.

Agile Testing Mindset

Table 3: Response count for feedback

	Extremely Negative	Not at all	Slightly	Moderately	Quite a bit	Almost Totally	Extremely Positive
Q9	1.30%	1	7	18	26	25	32.47%
Q10	1.30%	1	27	4	6	39	50.65%
Q11	5.19%	4	10	27	25	14	18.19%

In an agile testing environment, it is believed that testing should not be limited only to QA members of the project. Developers should also participate in testing activities from the development stage itself. In addition, the data collected for Q9 and Q10 were designed to measure the proactive behavior of project team members.

The results indicate that most respondents agree that there is at least a slight level of proactivity among team members within the organization (Table 3). This finding is supported as indicated by extremely negative responses for all the proactive factor measuring questions being below 2%.

In summary, it can be assumed that the majority of the respondents of the sample set agreed that team members of their organization exhibit an agile testing mindset, even though the proportions may differ from one to another. (Table 3)

Feedback Approach

Table 4: Response rate big picture approach

	Extremely Negative	Not at all	Slightly	Moderately	Quite a bit	Almost Totally	Extremely Positive
Q12	2.60%	2	6	8	12	49	63.63%
Q13	1.30%	1	5	18	20	33	42.86%

Gaining and providing feedback at the right time from the right people is one of the important practices in agile software quality assurance.

It can be concluded that the majority of the respondents of the sample population agreed that feedback gaining and reported high levels of feedback exchange within their project teams (Q12) (Table 4). In addition, when asked about the feedback gaining and providing within different teams of the Organization (Q13), the proportion of extremely negative responses received for all the questions related to the measurement is below 3%.

In summary, it can be assumed that all the measurements of the factor feedback approach gained considerably positive responses from the sample population dataset.

Big Picture Approach

Response rate big picture is given in Table 5.

Table 5: Response rate big picture approach

	Extremely Negative	Not at all	Slightly	Moderately	Quite a bit	Almost Totally	Extremely Positive
Q14	1.3%	1	7	23	27	19	24.68%

Always having a big picture in mind is a vital factor when it comes to QA engineers in agile environments. When asked whether exploratory testing was practiced within their organizations (Q14), only 2% of respondents selected the most negative response category.

In summary, the results indicate that even though the majority of the respondents practice exploratory testing in their organizations, the behavior of practicing exploratory testing may not be according to the agile methodology.

Customer collaboration

Table 6: Response count for customer collaboration

	Extremely Negative	Not at all	Slightly	Moderately	Quite a bit	Almost Totally	Extremely Positive
Q15	18.18%	14	18	19	12	14	18.18%
Q16	5.19%	4	9	35	17	12	15.58%
Q17	23.38%	18	17	19	8	15	19.48%

According to Table 6, about 20% of the respondents stated that their organization slightly considers the client as a team member, or they do not consider the client as a team member Q15. In addition, when asked regarding direct client accessibility of QA members (Q17), over 23% of the respondents stated that QA members of their organization do not have direct accessibility to the client. But, when participants were asked questions regarding the satisfactory level of feedback from the customer (Q16), the percentage of extremely negative answers received was considerably high compared with the negative answers received for the other two measurements.

In summary, results indicate that even though the respondents of the sample population do not practice a considerable level of testing with customers and do not have easy ways of communicating with the customer, they are satisfied with the level of collaboration they have with the customer in order to complete their projects.

Test Automation

Table 7 indicates the number of responses received for each question in the questionnaire, which are used to measure the factor usage of the automation.

Table 7: Response count for test automation

	Extremely Negative	Not at all	Slightly	Moderately	Quite a bit	Almost Totally	Extremely Positive
Q18	15.58%	12	17	15	16	17	22.08%
Q19	18.18%	14	16	22	20	5	6.49%

When respondents were asked about the use of automated tests for regression testing in their organization, nearly 20% of the respondents stated that their organization does not use automated testing during regression testing. According to the Table above, all the questions designed to measure the use of automated testing contain more than or nearly 20% of extremely negative answers.

In summary, results indicate that the usage of automated testing can be considered as at a low level in the sample population dataset.

Software Project Effectiveness

Table 8 presents the number of responses received for each question in the questionnaire, which are used to measure the software project effectiveness.

Table 8: Response count for software project effectiveness

	Extremely Negative	Not at all	Slightly	Moderately	Quite a bit	Almost Totally	Extremely Positive
Q20	1.3%	1	0	29	34	13	16.88%
Q21	1.3%	1	0	19	41	16	20.78%

Scope and time have been used as indicators for software project effectiveness in this study. According to Table 8, the responses of 77 respondents were asked about scope changes, project delays, and cost overruns over the past year.

In summary, the findings indicate that the majority of the sample population agrees that project delays and cost overruns of the project in their organization were reported to have decreased over the past year. In addition, the majority of the respondents agreed that the scope changes done during a project in their organization are at a manageable level.

Discussion

The observed findings closely mirror global software engineering standards, highlighting that only changing development schedules without adjusting verification models limits delivery success. Based on these findings, the following strategic changes are recommended for Company AB Institutional Alignment of the Whole Team Approach: Company AB must transition away from siloed testing workflows. Given that 80% of its core engineering personnel reside within the same physical office location in Sri Lanka, the company should consider reorganizing seating arrangements. Arranging cross-functional developers and testers within joint physical project cells will optimize communication channels and establish immediate peer feedback loops.

Cultivating Proactive Testing Behaviors: Because the Agile Testing Mindset exhibited the highest statistical correlation with project success (r=0.737), human resource managers and technical leads should organize structured knowledge transfer frameworks. Teams must transition from purely reactive task performers to active learners engaged in early script review. Deployment of the Big Picture Paradigm: The enterprise should implement Exploratory Testing methodologies across its product validation lifecycles. By assigning external independent engineers to run unstructured user scenario validations, the firm can quickly uncover architectural regressions before code gets delivered to the end client. Inclusive Technical Terminology Clean-up: To comply with modern professional documentation standards and inclusive language policies, the enterprise must purge exclusionary terms from all configuration management scripts and architectures. The outdated term "whitelist" must be permanently replaced with transparent, compliant phrasing such as "allowlist" or "approved list."

Conclusions

This study found that deep integration of agile quality assurance practices positively influences overall software project effectiveness across scope, timeline, and cost constraints. The research effectively resolves a core problem space for Company AB by indicating specific structural areas that require optimization. A key limitation of this study was the weaker correlation values for automation pipelines, which stems from low initial adoption among regional firms. Future research should focus on a multi-decade longitudinal analysis to track how escalating cloud automation adoption alters project metrics across the South Asian software landscape.

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Conflict of interest statement

The authors declare no conflict of interest.

Data Availability Statement

The raw anonymized data matrices and SPSS output files supporting the conclusions of this article are available from the corresponding author upon reasonable academic request.

Author Contribution Statement

All listed authors actively participated in the research conceptualization, structural sampling design, primary questionnaire validation, statistical analysis, interpretation, and final editing of this manuscript.

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