

IMPACT OF SOFTWARE QA ENGINEER ROLE TO SAP PROJECT DELIVERY SUCCESS IN SRI LANKA

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DECLARATION

I declare that this is my own work and this thesis does not incorporate without acknowledgment any material previously submitted for a degree or diploma in any other University or institute of higher learning and to the best of my knowledge and belief, it does not contain any material previously published or written by another person except where the acknowledgment is made in the text.

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Date

The above candidate has carried out research for the Master's thesis under my supervision.

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ABSTRACT

Software Quality Assurance (SQA) plays a crucial role in ensuring the successful delivery of SAP projects, including support, implementation, and rollout. However, in the Sri Lankan context, the significance and impact of SQA engineers on project outcomes remain underexplored. This study aims to investigate the role of SQA engineers in SAP project delivery success in Sri Lanka. This research focuses on their influence on SAP projects delivery quality, risk and overall project efficiency.

With a qualitative research approach, this has gathered insights from SAP project stakeholders, including SQA engineers, project managers, consultants (SAP Functional & Technical), and end-users, to understand how quality assurance practices contribute to project success. Semi-structured interviews and thematic analysis are used to explore key themes such as defect prevention, compliance with SAP standards, stakeholder collaboration, and the challenges faced in ensuring quality within SAP projects.

The findings of this research will provide valuable insights into the best practices of software quality assurance in SAP projects within the Sri Lankan IT industry. It will highlight how SQA engineers and SAP Functional Consultants add values to the projects beyond defect detection. It helps to enhance user satisfaction, system stability, and adherence to business requirements. Additionally, the study will offer recommendations for improving QA strategies regarding SQA Engineer & SAP Functional Consultant roles in SAP project environments to ensure more efficient and reliable implementations.

By understanding the criticality of Quality Assurance in SAP project success, organizations can optimize their quality assurance frameworks and strengthen their project delivery methodologies, ultimately leading to improved business outcomes in Sri Lanka's growing enterprise software landscape.

Keywords: SAP, Functional Consultant, Quality Assurance, SQA Engineer

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LIST OF ABBREVIATIONS

SQA	Software Quality Assurance Engineer
SAP	Software Applications Products (SAP ERP System)
ERP	Enterprise Resource planning
SD	Sales & Distribution
MM	Materials Management
FS	Functional Specification

CHAPTER 01: INTRODUCTION

1.1 Background

SAP can be identified as one of the major ERP systems used by many companies around the globe. Leading companies like Alphabet, Apple, Ford, General Motors, AT&T, Walmart use SAP as an ERP application. SAP is also used by many Sri Lankan companies as well. CBL Group, Maliban Group, Laughs Group, MAS Holdings, Camso, Hemas Group & Lanka Steel Corporation are few among them

Multiple carrier roles can be identified with regards to SAP projects. Same goes in Sri Lankan context as well. Few of the major roles are SAP Functional Consultant (SD, MM, PP, FICO, QM, PM), SAP Technical Consultant (ABAP, BASIS), SAP BW Consultant, etc.

In Sri Lanka, SAP project delivery including support, implementation, and rollout, is heavily relied on functional consultants who often take on the responsibility of quality assurance (QA) testing. While these consultants possess deep domain knowledge and business process expertise, their primary role is to configure and implement SAP solutions rather than rigorously testing software quality. Some organizations have employed specialized Software Quality Assurance (SQA) engineers to handle SAP project testing to ensure defect detection, validation, and adherence to quality standards. This contrast in role allocation has raised a key question: which approach leads to more successful SAP project delivery?

The effectiveness of QA in SAP projects directly impacts system stability, user satisfaction, and business process efficiency. Functional consultants, while familiar with SAP configurations, may lack formal training in structured testing methodologies, test automation, and defect lifecycle management. On the other hand, dedicated SQA engineers bring expertise in software testing but may not have in-depth SAP domain knowledge. This study aims to explore industry expert opinions on the optimal approach to SAP quality assurance.

Furthermore, this research seeks to identify potential gaps in both roles and assess their impact on SAP project success in the Sri Lankan IT industry. By analyzing the experiences and insights of key stakeholders, the study will provide recommendations to help organizations optimize their QA strategies, improve project efficiency, and enhance the overall quality of SAP implementations. Understanding the best approach to SAP testing will enable Sri Lankan companies to make informed decisions about resource allocation and skill development in their SAP project teams.

1.2 Motivation

Over the past decade, the researcher has gained extensive experience in the SAP industry and has observed multiple project delivery failures linked to weaknesses in quality assurance (QA) practices. These issues often arise from two main challenges: functional consultants lacking formal training in structured testing, and Software Quality Assurance (SQA) engineers struggling to fully understand SAP's complex business processes. These observations highlighted a significant gap in how QA responsibilities are managed in SAP projects, particularly within the Sri Lankan context.

Although SAP ERP adoption in Sri Lanka has increased in recent years, literature points to persistent shortcomings in QA practices throughout the implementation lifecycle. It has been identified that post-implementation QA as a critical weakness in the construction sector often leading to misconfigurations and underutilization of SAP functionality [30]. Similarly, many Sri Lankan contractors fail to effectively use SAP's QA modules in material management, indicating a lack of structured quality control [31].

Earlier studies reinforce these concerns. A study done on ERP projects in Sri Lanka has concluded that many failures stemmed from the absence of structured QA mechanisms during system configuration and rollout [32]. Also, it was evident that informal or absent QA practices, along with an overreliance on external consultants, undermine the long-term success of ERP initiatives in Sri Lanka [33].

In most Sri Lankan SAP environments, QA duties are commonly assigned to functional consultants due to their strong domain knowledge. However, their limited exposure to formal testing methodologies often results in overlooked defects and inefficiencies. On the other hand, SQA engineers possess testing expertise but may lack the business process knowledge needed to effectively test SAP solutions. This role-based mismatch raises a critical question: which approach is more suitable for SAP QA in Sri Lanka, or could a hybrid strategy be more effective?

Global research further supports the presence of QA challenges in SAP implementations. For instance, a 2021 study by the International Research Journal of Modernization in Engineering, Technology and Science points to recurring issues such as insufficient automated testing, lack of continuous QA frameworks, and poor stakeholder collaboration in multinational SAP projects [34]. The study highlights that many organizations still rely on manual testing, which delays go-live and increases defects even when automated tools are available [34]. Meanwhile, Tricentis, a leading QA solutions provider found that frequent updates in cloud-based SAP systems (e.g., S/4HANA) significantly strain QA teams without scalable automation options and quality teams face issues with deployment timelines and budgets overrun [35]. These international insights reinforce the researcher's motivation to explore the QA challenges observed in Sri Lankan SAP projects.

Motivated by these challenges, this study aims to explore how QA responsibilities are currently handled in Sri Lankan SAP projects and to assess the effectiveness of each role. By gathering insights from industry experts, the researcher seeks to identify role-based strengths and weaknesses, uncover existing gaps, and propose actionable recommendations to enhance quality outcomes. The goal is to reduce project risks, improve defect detection, and strengthen the overall reliability of SAP project delivery in the Sri Lankan context.

1.3 Problem Statement

Ensuring the quality of SAP deliverables remains a critical challenge for many organizations in Sri Lanka. Despite the growing adoption of SAP solutions, inefficiencies in quality assurance (QA) practices have frequently led to project delays, system defects, and unsatisfactory end-user experiences. Traditionally, SAP functional consultants have been responsible for testing, leveraging their business process expertise to validate system functionality. However, their lack of formal QA training often results in inadequate test coverage and undetected defects. Conversely, some organizations employ specialized Software Quality Assurance (SQA) engineers to conduct testing, yet these professionals may struggle with the complexities of SAP's highly integrated business processes.

1.4 Research Objectives

This disparity raises a fundamental question: What can local SAP teams do better to achieve quality in SAP deliverables? The absence of a standardized approach to QA in SAP projects has contributed to inconsistent results, rework, and increased costs. Additionally, gaps in role clarity, testing methodologies, and collaboration between functional consultants and SQA engineers have further impacted project efficiency.

The aim of the research is to achieve the following objectives.

1. To identify key challenges and limitations faced by Software QA Engineers & Functional Consultants that impact the successful delivery of SAP projects in Sri Lanka.
2. Provide recommendations to improve the QA perspective of SAP delivery process

1.5 Scope of the project

This disparity raises a fundamental question: What can local SAP teams do better to achieve quality in SAP deliverables? The absence of a standardized approach to QA in SAP projects has contributed to inconsistent results, rework, and increased costs. Additionally, gaps in role clarity, testing methodologies, and collaboration between functional consultants and SQA engineers have further impacted project efficiency.

By gathering insights from industry experts, this research will identify key gaps, challenges, and best practices to optimize quality assurance processes in SAP projects. The findings will provide practical recommendations for Sri Lankan SAP companies to enhance their QA strategies, reduce defects, and improve overall project success

1.6 Outline

The rest of this thesis is organized as below. Chapter 2 is written to present a descriptive literature review on the related topics. ERP Systems & SAP, SQA Engineering practices and SAP project context are covered in the topics. Chapter 3 is written to describe the research methodology. Research methodology used and the approach is justified in this chapter along with the data collection and data analysis methods which are further explained in the coming chapters. Chapter 4 is used to describe the data analysis phase with the steps used by the researcher to come up with the final outcomes. Chapter 5 is written to explain the outcomes found in the data analysis phase while Chapter 6 is written on the recommendations provided based on the research findings to complete the thesis.

CHAPTER 02: LITERATURE REVIEW

2.1 Introduction

Software Quality Assurance (SQA) plays a critical role in ensuring the success of enterprise software projects. In the context of SAP projects, which include Implementation, Rollout, and Support phases, the role of SQA engineers becomes essential in maintaining system integrity, reducing defects, and improving user satisfaction. This chapter reviews existing literature on the impact of SQA on SAP project delivery success, focusing on key themes such as quality assurance in enterprise systems, SAP project phases, testing methodologies, and the role of SQA engineers in Sri Lanka. When it comes to Sri Lankan SAP projects there is very limited or no research literature available for the topic.

2.2 Software Quality Assurance in Enterprise Systems

2.2.1 Definition and Importance of Software Quality Assurance (SQA)

Software Quality Assurance (SQA) is implemented to ensure that software development and implementation adhere to predefined standards and requirements. Various processes, tools, and methodologies are utilized to maintain software reliability, usability, and compliance with business needs. In Enterprise Resource Planning (ERP) systems such as SAP, SQA is regarded as essential for the seamless operation of business processes. By ensuring rigorous quality control, the risks of inefficiencies, system failures, and costly maintenance efforts are mitigated [1].

2.2.2 SQA in ERP Systems

ERP systems integrate multiple business functions, such as finance, human resources, and supply chain management, into a single platform. While efficiency is enhanced, the complexity of these systems necessitates stringent quality assurance. In SAP implementations, extensive configurations and customizations are required, making them vulnerable to defects if quality control measures are inadequate. A lack of robust QA practices often results in operational disruptions, data inconsistencies, and security risks. When strong SQA measures are adopted, project risks are significantly reduced, and better alignment with business objectives is ensured [2].

2.2.3 Impact of Poor QA on ERP Project Success

The consequences of inadequate QA in ERP projects include system downtimes, failed integrations, and financial setbacks. Studies have demonstrated that projects with insufficient testing strategies encounter higher failure rates and require extensive corrective actions after deployment. Many SAP projects have failed due to undetected defects emerging after

implementation, leading to disruptions in business operations. To mitigate such risks, thorough testing at every phase of the SAP project lifecycle is imperative [3].

2.3 SAP Project Lifecycle and Quality Considerations

2.3.1 SAP Project Life Cycle and Delivery Models

SAP projects follow a structured lifecycle, including Implementation, Rollout, and Support phases [4]. Each phase presents distinct challenges:

- **Implementation:** Involves system configuration, data migration, and initial testing. Defects found in this stage can significantly impact project timelines [5].
- **Rollout:** Extends an existing SAP system to additional locations or business units. Ensuring consistency in business processes and system performance is crucial (Esteves & Pastor, 2001).
- **Support & Maintenance:** Focuses on issue resolution, enhancements, and continuous testing to improve system performance over time [6]. Quality assurance methodologies applied to each phase impact the overall success of the SAP project.

2.3.2 Phases of SAP Project Implementation

Each phase of SAP project implementation presents distinct quality assurance challenges:

- **Blueprinting:** Business processes and system requirements are analyzed and documented to ensure that all critical needs are captured accurately.
- **Configuration:** The system is customized based on business requirements, and quality assurance ensures that the configurations align with expected functionality.
- **Testing:** Multiple levels of testing, including unit testing, integration testing, and user acceptance testing (UAT), are performed to detect defects before deployment.
- **Go-live:** The system is deployed for operational use, with quality assurance verifying data accuracy, system stability, and user readiness.
- **Support:** Continuous monitoring and issue resolution are conducted post-implementation to ensure system performance and efficiency [7].

2.3.3 Quality Challenges in SAP Implementations

Various quality challenges are commonly encountered in SAP implementations:

- **Inadequate testing coverage:** Poorly structured test cases contribute to undetected defects that may cause operational issues.
- **Poor requirement gathering:** Misalignment between business requirements and system configurations often leads to functional gaps.

- **Integration failures:** Seamless communication between SAP modules is essential; any failure in integration may disrupt business operations [8].

2.3.4 Common SAP Project Failures Due to QA Issues

Multiple SAP project failures have been resulted due to ineffective quality assurance. Functional consultants are frequently relied upon for testing, but their limited exposure to structured QA methodologies results in gaps in test coverage. Studies have indicated that projects incorporating dedicated QA professionals experience fewer defects and higher user satisfaction rates [9].

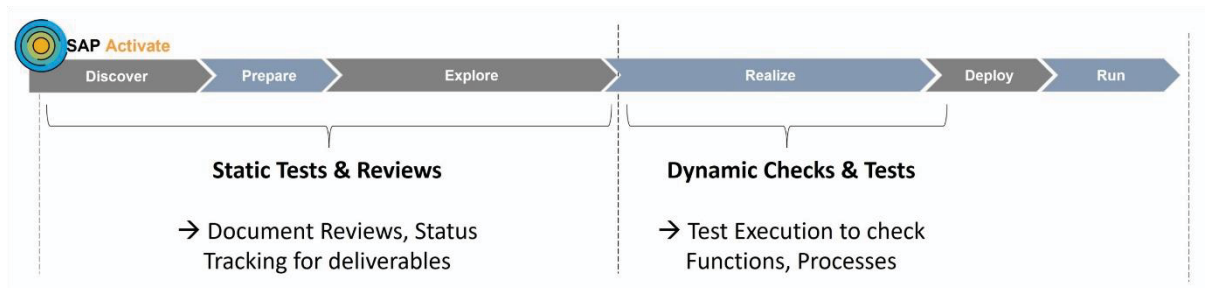


Figure 2.1: SAP Project Life Cycle testing phases

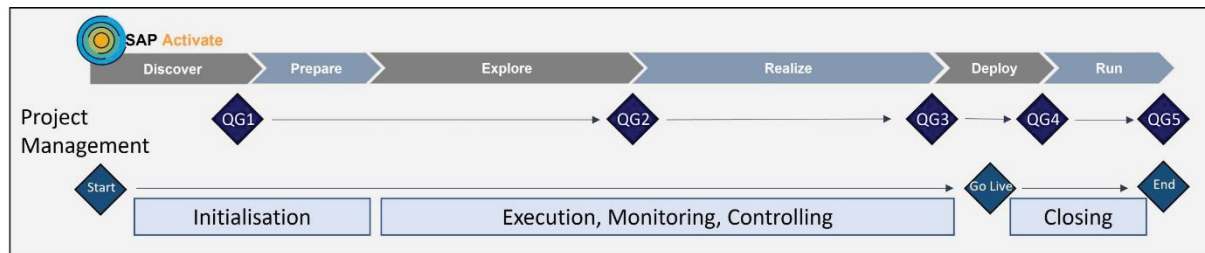


Figure 2.2: SAP Project Life Cycle with Activate

2.4 Role of Functional Consultants in SAP Quality Assurance

2.4.1 Responsibilities of SAP Functional Consultants

SAP functional consultants are primarily responsible for ensuring that business requirements are accurately configured within the system. Their duties include:

- Gathering and documenting business needs.
- Configuring SAP modules to align with business processes.
- Conducting preliminary validation of system functionalities.
- Providing training and support to end-users [10].

2.4.2 Strengths and Limitations of Functional Consultants in Software Testing

While functional consultants possess strong domain knowledge, formal training in structured testing methodologies is often lacking. Consequently, defects may go unnoticed, leading to costly post-implementation fixes. Without well-defined test planning and execution strategies, system quality is at risk of compromise [2].

2.4.3 Case Studies on Functional Consultant-led QA

Organizations that rely solely on functional consultants for quality assurance frequently report increased defect rates and extensive troubleshooting post-go-live. Case studies have demonstrated that SAP projects lacking dedicated QA professionals often face delays and cost overruns due to unaddressed defects [8].

2.5 Role of Software QA Engineers in SAP Testing

2.5.1 Core Competencies of Software QA Engineers

Software QA engineers are responsible for ensuring that SAP solutions function correctly and align with business requirements. Their core competencies include:

- Developing detailed test plans and strategies.
- Implementing various testing methodologies, such as functional, regression, and performance testing.
- Identifying, tracking, and resolving defects throughout the software lifecycle [11].

2.5.2 Manual vs. Automated Testing in SAP Environments

Manual testing is essential for usability and exploratory testing, as it allows QA engineers to validate SAP business processes in real-world scenarios. Meanwhile, automation testing is increasingly used to enhance efficiency in repetitive test execution. Tools like Tricentis, Tosca and SAP Solution Manager have enabled the automation of regression testing by reducing defect risks during system updates [2].

2.5.3 Challenges Faced by QA Engineers in SAP Projects

Despite their expertise in software testing, QA engineers often struggle with understanding complex SAP configurations and business processes. Extensive collaboration with functional consultants is required to ensure that effective test cases are designed. Without domain knowledge, QA engineers may be unable to validate business process workflows effectively [9].

2.6 Comparative Analysis: Functional Consultants vs. QA Engineers

2.6.1 Efficiency of Testing Performed by Functional Consultants vs. QA Engineers

Studies have shown that while functional consultants contribute valuable business process expertise, QA engineers provide structured defect detection methodologies. A collaborative approach involving both roles often results in more comprehensive SAP quality assurance [8].

2.6.2 Skills Gap and Training Needs and Industry Trends and Best Practices

Cross-training programs have been found to improve SAP project outcomes. Functional consultants who acquire testing knowledge enhance their ability to identify defects, while QA engineers who develop domain expertise create more effective test cases [10].

Current industry trends indicate a shift towards hybrid testing models that incorporate both business expertise and rigorous testing frameworks. Agile and DevOps methodologies are also increasingly integrated into SAP quality assurance processes [7].

2.7 Software Quality Assurance Challenges in SAP Projects

2.7.1 SQA Challenges & Issues in Sri Lankan SAP Projects

Sri Lanka's IT industry has seen significant growth in enterprise software implementation, including SAP deployments [12]. However, research on the role of SQA in SAP projects within Sri Lanka remains limited. Local studies suggest that many firms still rely on manual testing approaches, leading to inefficiencies and increased defect rates [13]. Bridging this gap through standardized QA practices can improve SAP project success rates.

It was found that SAP ERP implementations in Sri Lanka's construction sector at post-implementation quality assurance processes were either weak or entirely absent. These gaps often led to system misconfigurations and underutilization of core ERP functionalities, thereby compromising the long-term value of the implementation [30]. Similarly, another study highlighted the inadequate use of SAP's quality assurance modules during material management processes. Their study revealed that many Sri Lankan contractors failed to leverage the available QA features within SAP, leading to inconsistent data handling and operational inefficiencies [31].

Earlier research also supports these observations. ERP implementation studies in several Sri Lankan organizations have concluded that the lack of structured QA practices during system configuration and rollout was a major contributor to project failure. Their findings suggest that many organizations treated quality assurance as a secondary concern, rather than a core element of the implementation process [32]. Likewise, it was found that ERP success in Sri Lanka was often hindered by informal QA practices and overreliance on external consultants. The absence of clear quality standards and internal QA ownership created inconsistencies and delays in project execution [33].

Although these studies do not focus exclusively on the roles of Software Quality Assurance Engineers or Functional Consultants, they clearly point to systemic QA challenges in SAP projects within the Sri Lankan context. These findings underline the need for more structured and role-aligned quality assurance strategies to ensure the success and sustainability of SAP implementations.

2.7.2 SQA Challenges & Issues in Global SAP Projects

Quality assurance problems are not limited to Sri Lanka. Similar challenges are seen in SAP projects around the world. As organizations move toward more complex SAP systems, including cloud-based platforms like SAP S/4HANA, the demand for stronger and more consistent QA practices has increased.

A study published in the *International Research Journal of Modernization in Engineering, Technology and Science* pointed out several ongoing issues in global SAP implementations. These include the limited use of automated testing tools, the absence of continuous QA practices, and weak involvement from key project stakeholders throughout the delivery process [34]. The study noted that many project teams still rely on manual testing, which often leads to higher defect rates, delays in project timelines, and reduced system reliability.

At the same time, studies revealed that modern SAP systems, specially those delivered through the cloud require faster and more scalable QA approaches. It is explained that frequent updates in cloud-based SAP environments make it harder for QA teams to keep up using traditional methods. Without strong automation and integrated testing strategies, it becomes challenging to maintain quality and stability in these fast-paced projects [35].

These global examples show that SAP projects everywhere face pressure to modernize their QA processes. They also highlight the importance of planning QA early, using the right tools, and clearly defining QA responsibilities within the project team.

2.8 SAP Best Practices

2.8.1 SAP Best Practices Guideline

RISE with SAP Private Cloud Solution

SAP Best Practices are comprehensive, pre-configured business process solutions designed to streamline and expedite the implementation of SAP systems. These best practices encompass a wide range of industry-specific and cross-industry scenarios, providing organizations with standardized processes that are based on SAP's extensive experience and customer feedback. By leveraging SAP Best Practices, companies can reduce implementation time, minimize risks, and ensure a higher degree of consistency and compliance across their operations. The content includes detailed process descriptions, configuration guides, test scripts, and other essential documentation, all of which are accessible through the SAP Help Portal [15].

2.8.2 SAP Activate methodology

Designed to speed up and streamline the application of SAP solutions, including S/4HANA, across the cloud, on-premise, and hybrid environments, SAP Activate is SAP's latest implementation methodology. It combines SAP Best Practices, Guided Configuration tools, and a systematic agile framework into one cohesive whole. With this methodology, organizations can take pre-defined business processes, self-configurable interfaces, and follow a detailed step-by-step project roadmap. It's broken down into six phases: Discover, Prepare, Explore, Realize, Deploy, and Run. Each phase comes with specific milestones in the form of deliverables, quality gates, and other project success criteria.

A key differentiator of SAP Activate is its agile and fit-to-standard approach, which replaces the traditional blueprinting phase with fit-gap analysis workshops. This shift promotes faster decision-making, reduces customization, and enhances alignment with SAP's evolving best practices. Additionally, SAP provides solution-specific roadmaps through the SAP Roadmap Viewer, offering tailored guidance for various deployment scenarios, including RISE with SAP, SAP S/4HANA Cloud, and on-premise implementations [28].

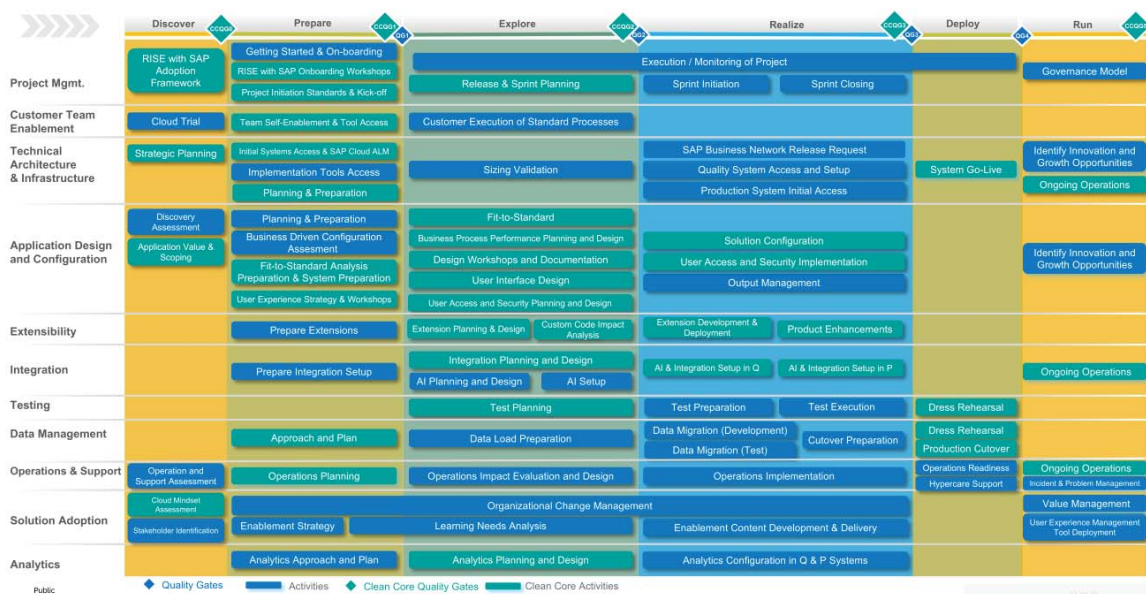


Figure 2.3: SAP Activate Methodology

2.8.3 SAP Test Suite

SAP Test Suite is an integrated set of tools within the SAP landscape designed to support comprehensive testing of SAP systems. It enables organizations to plan, execute, and monitor test activities efficiently across different SAP modules and business processes. The Test Suite covers functionalities such as test case management, manual testing, automated testing, and defect tracking. By incorporating risk-based test strategies, SAP Test Suite ensures that critical business processes are validated effectively, contributing to higher system reliability and reduced project risks during SAP implementations, upgrades, and support operations [27].

2.8.4 SAP Solution Manager 7.2

SAP Solution Manager is a centralized application lifecycle management (ALM) platform that provides end-to-end support for managing SAP and non-SAP systems. One of its core components is the Test Management functionality, which integrates closely with the SAP Test Suite to deliver structured test planning, execution, and reporting capabilities. Solution Manager 7.2 enhances the efficiency of quality assurance processes by enabling risk-based testing, business process documentation alignment, and defect management through a single, unified platform. Its tight integration with SAP landscapes ensures that organizations can maintain system integrity while adapting to continuous changes and innovations [14].

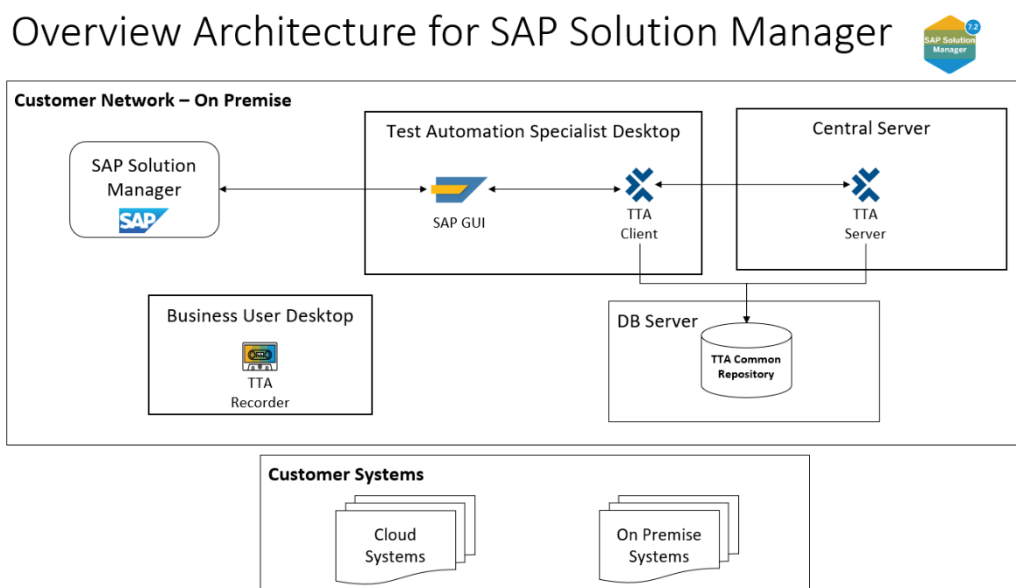


Figure 2.4: SAP Solution Manager Architecture

Test Suite of SAP Solution Manager

Activities to create automated tests using SAP or Partner test automation tool

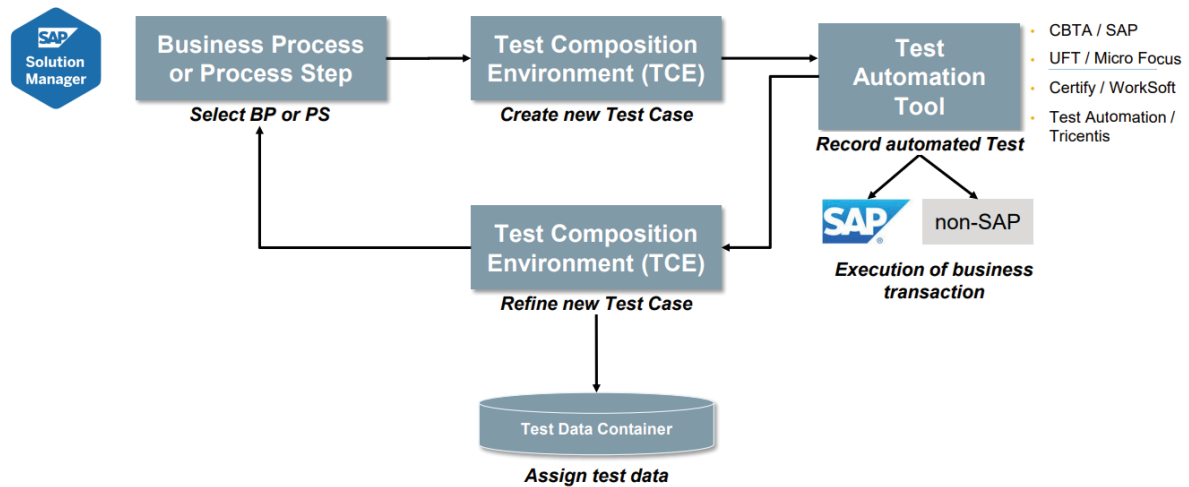


Figure 2.5: Test Suite of SAP Solution Manager

2.8.5 Test Automation with Tricentis

Tricentis Test Automation (TTA) has emerged as a key solution for enhancing SAP testing capabilities through its integration with SAP Solution Manager. Tricentis provides advanced, model-based automation frameworks that enable rapid test case creation, maintenance, and execution without requiring extensive technical expertise. By combining Tricentis tools such as Tosca with SAP Solution Manager, organizations benefit from faster testing cycles, improved defect detection rates, and reduced costs associated with manual testing. This integration supports both traditional on-premise SAP environments and modern cloud-based SAP S/4HANA systems, offering a flexible and scalable approach to quality assurance in complex SAP landscapes [16].

Test Configuration Creation

Starting from SAP Solution Manager

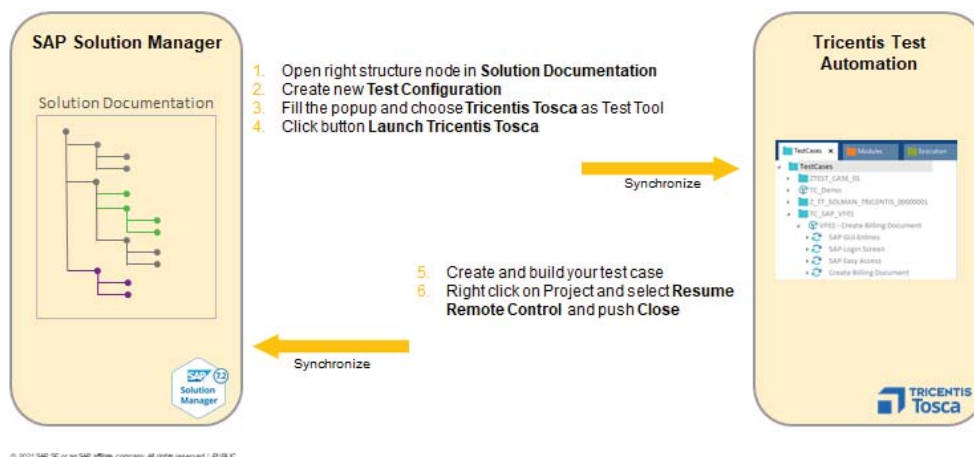


Figure 2.6: SAP Solution Manager & Tricentis Test Configuration

SAP Solution Manager 7.2 – Test Suite How obstacles in functional testing can be solved [14].

Hurdle 1: What are the important BP and PS of your Solution that needs full test attention?

Hurdle 2: Setup of manual testing / creation of manual tests

Hurdle 3: Setup / creation of automated tests

Hurdle 4: Data refresh of QAS / TST systems

Hurdle 5: Test Data identification and provisioning for manual and automated tests

Hurdle 6: Change Impact Analysis and optimized Test Plans

Hurdle 7: Identification of Software Changes not covered by Regression Tests

Hurdle 8: Agile development and testing for Transformation and Innovation projects

Test Automation Tools integrated with Test Suite

SAP and certified Partners

	Product	Scope	License
	Component Based Test Automation (CBTA)	SAP applications	No add. license required for SAP customers with SAP Enterprise Support contract
	Unified Functional Testing (UFT) *	SAP and non-SAP applications	additional license required
	Certify **	SAP and non-SAP applications	additional license required
	Test Automation ***	SAP and non-SAP applications	additional license required

* Former software division of Hewlett Packard Enterprise is now part of Micro Focus

** Focused solutions circle partner: <https://support.sap.com/solution-manager/focused/focused-solutions-circle.html>

*** no specific product name available for Tricentis Tosca functional test automation product

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Figure 2.7: Test Automation Tools

2.9 Summary & Research Gap Identification

The literature indicates that SQA is vital for the success of SAP projects, yet challenges such as time constraints, lack of standardized frameworks, and limited automation hinder its effectiveness. While global studies provide insights into SQA's impact, research specific to SAP projects in Sri Lanka is scarce. This study aims to address this gap by analyzing the role of SQA engineers in Sri Lankan SAP projects and providing recommendations for improving QA practices in enterprise systems.

CHAPTER 03: RESEARCH METHADODOLOGY

3.1 Introduction

This chapter outlines the research methodology adopted to by the researcher to investigate the role of Software Quality Assurance (SQA) engineers in SAP project delivery within the Sri Lankan. The primary objective of this study is to assess whether the introduction of a dedicated QA role is necessary for SAP projects and to provide recommendations for improving the overall QA perspective in SAP delivery processes. A qualitative research approach has been used, allowing an in-depth exploration of industry expert insights regarding current SAP quality assurance practices, challenges, and potential improvements. Through data collection and analysis, this study aims to provide actionable recommendations that can enhance SAP project success in Sri Lanka by optimizing quality assurance strategies.

3.2 Research Approach

Understanding the need of a SQE role to SAP domain & proving recommendation for improving the QA aspects of the SAP projects are the major objectives of the research. Given the nature of the objective, it is understood that a bottom-up approach is required to understand the dynamics involved in real life projects. The above points highlighted that a bottom-up approach should be followed by the researcher to conclude the objective by uncovering the abstraction of these situations [17]. Hence an inductive approach is used to achieve the objective by identifying the conclusions.

3.2.1 Research Method

A qualitative research approach has been adopted to explore the necessity of a specialized Software Quality Assurance (SQA) role in Sri Lankan SAP projects. This approach facilitates an in-depth understanding of industry perspectives by analyzing expert opinions, real-world experiences, and organizational challenges related to quality assurance in SAP implementations. Unlike quantitative methods that focus on numerical data, qualitative research allows for a comprehensive exploration of subjective insights, emerging trends, and contextual factors influencing SAP project quality. By employing this approach, the study aims to capture the complexities of SAP quality assurance practices and provide meaningful recommendations for improving the QA perspective in SAP project delivery.

Qualitative research is particularly effective when the goal is to explore *how* and *why* certain practices are adopted in specific organizational contexts [18]. In this study, qualitative methods have been used to uncover the real-world experiences of SAP professionals in Sri Lanka, focusing on their perceptions of QA responsibilities, testing challenges, and the potential role of specialized QA engineers. According to [19], the qualitative case study approach allows researchers to investigate software development environments over time and derive contextual insights. Given the exploratory nature of this study, a qualitative approach offers the flexibility

and depth needed to gather nuanced insights, making it highly suitable for research aimed at generating practical recommendations for industry improvement.

3.2.2 Research Strategy

A case study strategy has been employed for this research, as it enables an in-depth investigation of real-world SAP project environments in Sri Lanka. This strategy is particularly useful when complex issues such as organizational processes, role-based interactions, and quality assurance challenges are explored within their natural settings. The case study approach allows the researcher to examine both the context and the mechanisms through which Software Quality Assurance (SQA) roles influence project success. It provides an effective way to collect rich, contextual, and detailed data, aligning well with the qualitative research objectives of this study [20].

To conduct this research, two main case studies have been selected from SAP Project/Product organizations in Sri Lanka. These cases represent different approaches to QA within SAP projects. One relying primarily on functional consultants for testing and the other employing specialized SQA engineers. By examining these two contrasting environments, the research is positioned to compare the effectiveness of each QA model, highlight any role gaps, and generate practical recommendations. As research suggested, the use of multiple case studies enhances analytical rigor and provides opportunities for cross-case comparisons [19].

The case study method also supports the triangulation of data through the integration of interviews, documentation, and project records. This methodological triangulation increases the credibility and reliability of the findings by providing multiple perspectives on the same phenomenon. Methodological triangulation is essential in empirical software engineering research, as it strengthens the internal validity of case studies [20]. Given the exploratory nature of the research question and the need to understand context-specific dynamics in Sri Lankan SAP projects, the case study strategy has been identified as the most appropriate.

3.3 Case Organizations

Two organizations have been selected as the primary case studies for this research to examine the differing approaches to software quality assurance in SAP projects.

The first organization, names here onwards as **All Food Ltd** is one of the leading food manufacturing companies in Sri Lanka. With a strong presence in the local and export markets, All Food Ltd operates with a well-established in-house SAP team comprising approximately 12 consultants. In All Food Ltd 's SAP implementation and support projects, the quality assurance and testing responsibilities are primarily handled by functional consultants. These consultants, while possessing strong domain and configuration expertise, also engage in user acceptance testing (UAT) and validation activities as part of their project roles. The company's reliance on functional consultants for testing reflects a common practice in the Sri Lankan SAP industry, where dedicated QA roles are not always formally introduced into project teams.

The second organization is **ABC Ltd**, now operating under the brand ABC Ltd, a global provider of integrated e-commerce solutions. ABC Ltd focuses on developing SAP-compatible e-commerce products that enable seamless integration between web shops and ERP systems. Unlike All Food Ltd, this organization employs specialized Software Quality Assurance (SQA) engineers to conduct comprehensive testing of its SAP-integrated products. The SQA team is involved in designing and executing test plans, performing functional and regression testing, and ensuring that the product aligns with both technical and business requirements. Their approach demonstrates a structured QA process supported by dedicated resources, offering a contrasting model to that of All Food Ltd and serving as an insightful example for evaluating the impact of specialized QA roles in SAP environments.

3.4 Data Collection Strategy

To ensure a comprehensive understanding of the quality assurance practices in SAP projects across the selected organizations, multiple qualitative data collection methods have been employed. These include in-depth interviews, focus group discussions, direct observations, participant observations, and document analysis. The combination of these methods aligns with the principle of triangulation, which enhances the reliability and validity of qualitative research by allowing data to be cross verified through multiple sources [21]. In-depth interviews were conducted with SAP consultants, QA engineers, and project managers to gather detailed insights into their roles, responsibilities, and perspectives on QA processes. These interviews allowed participants to express their experiences and reflections openly, which is essential for capturing the nuanced realities of SAP project environments.

Focus group discussions were facilitated to explore shared experiences and collective insights among team members working within the same QA structures. This approach enabled the identification of common themes and differences in perceptions across the two case organizations. Additionally, both direct and participant observations were carried out during project activities and team interactions, allowing the researcher to document behaviors, communication patterns, and testing practices in real-time. Document reviews, including test plans, defect logs, and process documentation, provided supplementary data to support the analysis. The use of multiple qualitative data sources is consistent with best practices in case study research and contributes to a richer, more contextualized understanding [22].

3.4.1 Data Collection

To gather rich, contextual insights for this qualitative study, multiple data collection techniques were employed, with a primary emphasis on in-depth interviews. Semi-structured interviews were conducted with a purposive sample of SAP professionals, including functional consultants, SQA engineers, and project managers across the two selected organizations. Each interview lasted between 40 to 60 minutes, providing ample time for participants to reflect on their experiences with SAP testing processes, quality assurance challenges, and role responsibilities. The open-ended nature of the interviews allowed participants to share their

perspectives freely, which supported the discovery of recurring themes and nuanced differences between QA practices across different SAP project settings.

In addition to interviews, direct observations were conducted to capture how QA activities were performed in practice. Functional testing sessions were observed to understand how defects were identified and resolved, how documentation was managed, and how collaboration occurred between team members. Project review meetings were also attended to gain insights into quality checkpoints, issue escalation processes, and stakeholder feedback. Furthermore, several key project artifacts, such as functional specifications, technical estimations, and test documentations were reviewed. These documents provided valuable context regarding how quality expectations were defined, communicated, and tracked throughout the project lifecycle. The combination of these data sources enhanced the credibility of the research through triangulation and provided a holistic view of QA practices in Sri Lankan SAP project environments.

Method	Participant/Activity	Tools
In-Depth Interviews	SAP Team Members Project Managers End Users	Semi-Structured open-ended questions
Observation	Requirement Gathering Meetings Functional Testing Sessions Post Go-Live Project Review Sessions	
Document Analysis	Functional Specifications Project Blueprints Technical Estimations	

Table 3.1: Methods employed in data gathering

3.5 Data Analysis

Thematic analysis has been selected as the primary method for analyzing qualitative data in this study, due to its flexibility and ability to uncover rich, detailed insights from textual information. This approach is particularly well-suited to exploring perceptions, experiences, and patterns in qualitative research, which aligns with the goals of this study [23]. In this research, thematic analysis has been applied to the data collected from interviews, focus groups, observations, and documents to identify recurring themes related to QA roles, responsibilities, and effectiveness in SAP projects.

The process of thematic analysis followed six systematic steps [23], (1) familiarization with the data, (2) generation of initial codes, (3) searching for themes, (4) reviewing themes, (5) defining and naming themes, and (6) producing the final report. Each transcript was carefully read and coded manually to ensure that important patterns and meanings were captured. This

method enabled a nuanced interpretation of how functional consultants and SQA engineers contribute to quality assurance within the selected SAP environments. The themes that emerged from this process were then compared across the two case study organizations to identify both commonalities and differences.

Thematic analysis not only allowed for the categorization of responses into meaningful clusters but also provided a foundation for developing insights and practical recommendations. Thematic analysis is a valuable method for ensuring a transparent and rigorous analysis in qualitative research when applied systematically [24]. Therefore, this approach has been instrumental in generating credible, evidence-based findings for the research objectives.



Figure 3.1: Thematic Analysis Process (Braun & Clarke, 2006)

3.6 Summary

This chapter has detailed the methodological framework adopted to investigate the role and effectiveness of Software Quality Assurance (SQA) practices in SAP projects within the Sri Lankan context. A qualitative research approach was selected to explore the real-world experiences and insights of SAP professionals, allowing for a deep understanding of current quality assurance challenges and the potential benefits of introducing a dedicated QA role. A case study strategy was applied to study two organizations with contrasting QA structures, offering valuable comparative perspectives. Data were collected through multiple qualitative methods like interviews, observations, focus group discussions, and document reviews to ensure a well-rounded view of SAP project quality assurance practices.

Thematic analysis was employed to identify recurring themes and draw meaningful conclusions from the data, with a focus on understanding the influence of role specialization on project success. Methodological triangulation and participant validation were used to enhance the trustworthiness of the findings. Ethical considerations were also prioritized throughout the research process. Overall, the methodology presented in this chapter provides a robust foundation for the analysis and recommendations that follow, ensuring that the research outcomes are contextually grounded, credible, and practically applicable to Sri Lankan SAP project environments.

CHAPTER 04: DATA ANALYSIS

This chapter presents the approach taken to analyze the qualitative data gathered throughout the study, aiming to interpret the underlying patterns related to the research phenomenon. The focus is on generating meaningful and trustworthy insights aligned with the core objectives of qualitative research. It outlines the key aspects of the data collection process, the main areas explored during interviews, the profiles of the participants, and the structured process followed during data analysis. Special attention is given to the application of thematic analysis, detailing the systematic steps of coding the data, identifying sub-themes, and synthesizing them into broader, overarching themes that reflect the realities observed within SAP project environments.

4.1 Data Preparation for Analysis

The data analysis in this study has been primarily guided by the qualitative data collected through 15 in-depth interviews, direct observations during project activities, and the examination of relevant project documents. The interviews were conducted with two primary stakeholder groups involved in SAP project delivery: functional consultants and software quality assurance (SQA) engineers. Participants were selected from various levels within each group, including consultants, leads, and project managers, to capture a broad range of perspectives and experiences. These interviews were designed to explore individual roles in QA activities, perceived effectiveness of current testing practices, and opinions on the necessity of a dedicated QA role in SAP projects.

The participants from both All Foods Ltd and ABC Ltd were experienced SAP consultants. Each consultant with approximately ten years of industry exposure. They had been actively involved in multiple SAP projects within their organizations, including implementations, rollouts and ongoing support. Many also had substantial experiences working on SAP projects outside their current organizations, offering broader insights into quality assurance practices across different project environments. Interviews were conducted until thematic saturation was reached where no new significant insights were emerging. Ensuring that the data collected was both rich and comprehensive for the purpose of analysis.

In addition to interviews, observations were made during functional testing sessions and project review meetings to better understand the real-time interactions, processes, and challenges faced by the project teams. Supporting documents such as functional specifications, technical estimations, and test plans were also analyzed to triangulate findings and add context to the interview data. A summary of the participants' roles, responsibilities, and experience levels mentioned below.

Company	All Food Ltd	
Position	Responsibility	Experience in industry
Senior Manager-Information Systems	Lead Functional Consultant for all SAP modules-Design validate solutions/Project Management	20 + Years
Senior SAP FI Consultant	Design SAP FI Solutions and configure/test	15+ Years
Manager SAP Technical	Lead SAP Technical teams/Project Management	15+ Years
Senior SAP MM Consultant	Design SAP MM Solutions and configure/test	15+ Years
Senior SAP PP Consultant	Design SAP MM Solutions and configure/test	15+ Years
SAP SD Consultant	SAP SD Support & Configurations	7+ Years
SAP SD Consultant	SAP SD Support	5+ Years
SAP BASIS Consultant	SAP Landscape & Security	15+ Years
Company	ABC Ltd	
Position	Responsibility	Experience
Team Lead SAP Technical	Design and implement solutions	8+ Years
Technical Lead-SAP Developments	Design and implement solutions	11+ years
SAP MM Functional Consultant	Provide SAP solutions	7+ Years
Lead QA Engineer	Design/Develop/Implement Tests	10+ Years
Project Manager	Manage project life cycle and resources	10+ Years

Table 4.1: Interviewed employee profiles

The interviews were conducted online via Microsoft Teams, providing a convenient and accessible platform for participants across different locations and schedules. The interview questions were carefully tailored based on each participant's role in the SAP project, ensuring that relevant and insightful information could be gathered from both Functional Consultants and Software Quality Assurance (SQA) Engineers. This role-specific approach allowed the discussions to remain focused and aligned with the overall research objective of evaluating the effectiveness and impact of QA roles in SAP project delivery. While all interviews explored common themes related to quality assurance and project outcomes, specific questions were designed for each group to capture their unique responsibilities, experiences, and perspectives within the SAP QA process.

4.2 Data Analysis

Familiarizing the Data

Data analysis in qualitative research does not follow a linear approach as typically observed in quantitative studies. Rather, it involves an iterative cycle where the researcher frequently revisits previous steps as necessary. Below e steps were followed in this research.

1. Familiarization
2. Transcription
3. Coding

These steps were performed repetitively. The researcher converted the collected verbal data into written text and then proceeded with the coding process. Interviews done via online tools like MS teams provided automatic transcripts in which small adjustments were made to correct the wordings. In addition to that, field notes gathered through other data collection techniques were reviewed and further developed into structured and coherent narratives.

Transcription of verbal data

Transcription was done both manually and automatically, as described in the previous section. Online transcriptions were used with minor adjustments and manual process was also followed for other interviews done via non-online methods.

Generating Initial Codes

Transcriptions were used to generate the initial codes. Codes are the basic element of the raw data that appears to be interesting for the researcher in a meaningful way [25]. Identifying these short paragraph segments with meaning is an important step in the data analysis process. More meaningful themes are developed based on the initially identified codes.

Knowledge and the domain experience of the researcher also influence the identification and the interpretation of the codes, which is unavoidable. All together 34 common codes were identified during the analysis and later used to derive meaningful sub-themes and themes.

Online qualitative analysis software “Delve” was used to help the coding and data analysis process.

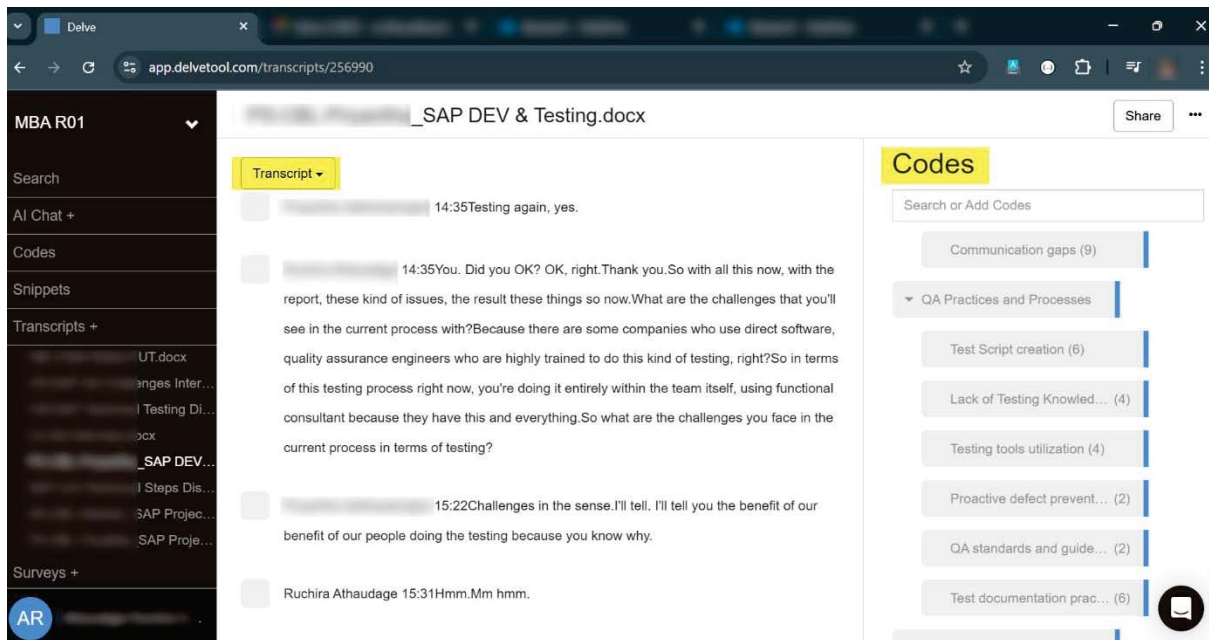


Figure 4.1: Thematic analysis with Delve

Identification of Themes & Naming Themes

The thematic analysis was carried out through a systematic and rigorous review of the interview data, where a comprehensive set of initial codes was generated using an inductive, data-driven approach. Detailed aspects emphasized by participants, such as QA role clarity, skills and competencies, collaboration effectiveness, and adherence to QA processes, were captured through coding. Subsequently, relationships and similarities among these codes were examined, and relevant sub-themes were identified. Through an iterative process of comparison, refinement, and consolidation, five final themes were derived, each representing broader patterns emerging from the data.

Final themes

- Skills & Competencies
- QA Practices and Process Maturity
- Quantitative and Qualitative Project Delivery Outcomes
- Collaboration and Communication Dynamics
- Organizational Culture and Management Support

Initial Codes	Sub Themes	Themes
QA role clarity	Technical Skills	Skills & Competencies
Responsibilities overlap	Business/Functional Skills	
SAP standard practices & tools		
Domain knowledge	QA Practices & Process Maturity	QA Practices and Process Maturity
Technical knowledge (SAP-specific knowledge)		
QA experience		
Functional Consultant involvement in testing		
Defect detection efficiency	Collaboration and Communication	Collaboration and Communication Dynamics
QA contribution to risk mitigation		
Impact on timeline	Impact on Project Delivery	Quantitative and Qualitative Project Delivery Outcomes
Impact on budget		
Impact on client satisfaction	Management and Cultural Factors	Organizational Culture and Management Support
Communication gaps	Role Definition and Clarity	
Test documentation practices	Challenges	
QA standards and guidelines adherence		
Test automation skills		
Proactive defect prevention		
Quality culture within SAP teams		
Training and skill development		

Figure 4.2: Thematic analysis process

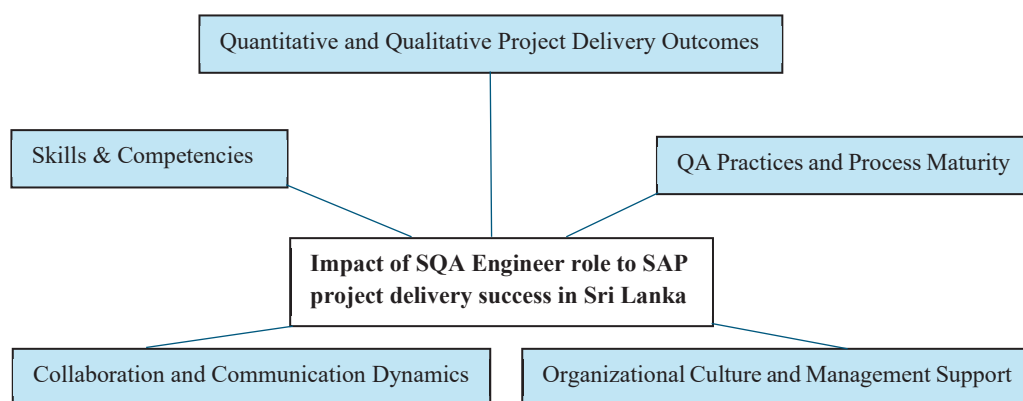


Figure 4.3: Final Core Themes

4.3 Summary

The chapter summarizes the key stages undertaken during the data analysis phase of this qualitative study. Main data source for the study was the interviews conducted; hence these interviews were carefully conducted, and questions were generated to get the most out of each interview. Thirteen individuals working in the SAP domain participated in the interviews. Both the companies were handpicked to understand the scenario and identify the right people to interview. Once the interviews are done, transcripts are generated using both manual and automated processes. Research has followed the thematic analysis methodology as Braun and Clarke's (2006). Data was then processed iteratively to identify codes, sub-themes and themes by adding more meaning and insight to the data.

CHAPTER 05: FINDINGS OF THE STUDY

5.1 Introduction

This chapter presents the findings of the study drawn from a thematic analysis of interview data collected from stakeholders involved in SAP projects within two case study organizations in Sri Lanka. The analysis was guided by the study's main research objectives. First, to identify the key challenges and limitations faced by Software Quality Assurance Engineers and Functional Consultants that impact the successful delivery of SAP projects and second to recommend ways to improve the quality assurance perspective within SAP project delivery.

Although the study did not reveal entirely unique or previously undocumented challenges, the findings emphasize several critical areas that strongly influence project quality in the context of the organizations studied. These challenges may be common in other SAP environments as well, but their impact and significance were clearly evident within the specific settings of the selected case studies. While previous research has highlighted various QA-related issues in Sri Lankan SAP projects, there has been limited focus on how these challenges specifically relate to the roles and responsibilities of Functional Consultants and Software Quality Assurance Engineers. This study, therefore, contributes by narrowing that gap and examining these role-specific issues within real project environments.

Through a systematic coding and categorization process, five major themes were identified. Each theme captures an important aspect of SAP project quality and reflects recurring patterns shared by participants. These include Clarity and Definition of the QA Role in SAP Projects, Skills and Competencies Required for SAP QA, QA Practices, Standards, and Process Maturity, Collaboration and Communication between QA and Functional Teams, and Management Support and Organizational Quality Culture.

While the study provides useful insights into quality assurance dynamics in SAP projects, it is important to acknowledge its limited scope. The findings are based on two case study organizations and may not fully reflect the broader SAP project landscape in Sri Lanka. However, they still offer a valuable perspective on the challenges and opportunities seen in similar organizational settings. It is also worth noting that the participants interviewed had an average of over ten years of SAP experience. Many of them had worked on multiple SAP projects outside their current organizations. As a result, the insights gathered are not entirely limited to the two case studies, even though they cannot be fully generalized to all SAP project environments.

5.2 Skills & Competencies required for SAP quality assurance

The first theme emerging from the analysis emphasizes the critical role of appropriate skills and competencies for individuals involved in SAP project quality assurance activities. Participants consistently highlighted that specialized knowledge areas are fundamental for ensuring the effectiveness of Software QA within SAP project environments.

Key findings from participants

It was identified that three core competencies are essential for successful quality assurance in SAP projects: **SAP configuration knowledge**, **business process knowledge**, and **testing experience and expertise**. Participants noted that Functional Consultants generally possess strong configuration skills and a deep understanding of business processes, enabling them to design and validate solutions effectively.

A senior SAP Consultant & a SAP project manager said that,

“Normally our functional team, they are very experienced from the day one. They started here. There are some functional consultant who have about 10 plus years’ experience. Some people are having many years. Some people are having about 10/15/20 years of experience.”

Another senior SAP Technical Lead as below

“They are coming purely from the business background”

Also, he mentioned the importance of having knowledge of the business process along with most of the other interviewees

“First important thing, we need to have the business process knowledge as much as business consultant or their internal team. That helps that otherwise that that will create gaps”

Similarly. It was identified that even though the Functional Consultants have the competence of business processes and SAP configurations, they lack professional testing expertise and knowledge which clearly impacts the project deliverables.

One interviewee said,

“Most of the time we do not do comprehensive performance testing”

“...but, but most of the functional consultants are not aware and not is skilled of these automation tools as well. So, that also make this work very manual and legacy.”

In contrast, many Software QA Engineers were found to lack in-depth SAP configuration knowledge and familiarity with business processes. While QA Engineers often demonstrated strong general testing skills, their limited exposure to SAP specific configuration practices and end-to-end process flows hindered their ability to design comprehensive test scenarios and detect critical defects proactively.

This is what a Senior IS Manager who is also a Senior SAP Consultant Manager said about SQA Engineer role with his experience in the current and past SAP projects.

“He/she doesn't have an experience or deep knowledge about SAP. So, he does is to simply checks interfaces and all. Check user interfaces are user friendly or not.”

The gap between the competencies of Functional Consultants and QA Engineers was frequently emphasized during the interviews, with several participants suggesting that a lack of SAP system understanding among QA Engineers directly impacted on the overall quality of deliverables

Challenges and Limitations Identified

The major challenge highlighted under this theme is the **competency gap** between Functional Consultants and QA Engineers in SAP-specific domains. Without adequate SAP configuration and business process knowledge, QA Engineers face difficulties in validating complex scenarios, understanding configuration impacts, and identifying integration points across SAP modules. This limitation increases the risk of undetected defects and reduces the overall effectiveness of quality assurance activities in SAP project delivery.

Opportunities and Recommendations

To bridge the competency gap, it is recommended that **targeted training programs** be developed to enhance the SAP-specific knowledge of Software QA Engineers. Organizations should encourage QA Engineers to gain practical exposure to SAP configuration activities and business process flows during project lifecycles. Certification programs focusing on SAP testing, configuration basics, and business process validation can further strengthen QA capabilities.

Meantime, SAP Functional Consultants should also be trained with professional testing practices and skills. Having all the business process knowledge & SAP configuration and other domain level skills, filling this gap would be very beneficial for the organizations when it comes to project planning and implementation. Having competent Functional Consultants with proper testing experience & knowledge will reduce extra resource utilization of projects which will ultimately lead to project success.

Additionally, project teams may benefit from pairing QA Engineers with experienced Functional Consultants during the early phases of projects to facilitate knowledge transfer and ensure that QA Engineers are better equipped to validate business requirements and technical configurations effectively.

5.3 QA Practices and Process Maturity

The second theme highlights the maturity level of quality assurance practices implemented across SAP projects. The findings reveal that the effectiveness of Software QA Engineers or

Functional Consultant is significantly influenced by the presence or absence of standardized, structured QA processes within the project environment.

Key Findings from Participants

Participants consistently reported that QA practices varied significantly between projects, depending largely on the experience of the project managers and the organizational emphasis on quality. In several cases, it was found that formal QA strategies, such as defined test planning, structured test case development, and proactive defect prevention mechanisms, were either weakly implemented or completely absent.

One Lead SAP QA Engineer said that,

“I have read that there are certain automated. Scripting in SAP in build. But I have not tried it yet.”

Also, it was identified that SAP Technical Leads and Consultants are not aware of the available SAP standard tools for Quality Assurance.

“let’s say there can be ways that in SAP also we have testing automation tools. This is one tool I just worked on, but there are different tools. Not much as other industries”

Many interviewees shared that, in practice, testing activities were often initiated late in the project lifecycle, with limited documentation of test scenarios, acceptance criteria, and defect management workflows. A reactive approach to quality assurance was observed, where testing was treated primarily as a final-phase activity rather than being integrated throughout the project stages. Furthermore, the absence of formal adherence to SAP Activate QA streams and testing best practices was noted as a significant weakness.

Challenges and Limitations Identified

The key challenge under this theme is the **lack of process maturity** in QA activities across SAP projects. Without standardized and structured QA practices, projects suffer from inconsistent test coverage, undetected defects, and extended project timelines due to last-minute issue discovery. The limited integration of QA into early project phases, such as requirement gathering and solution design validation, further exacerbates quality risks.

Additionally, the absence of comprehensive test documentation and formalized defect lifecycle management contributes to inefficiencies and repeatable quality issues across SAP implementations and support activities.

Opportunities and Recommendations

To enhance QA effectiveness, it is recommended that **formal QA methodologies and process frameworks** be embedded within SAP project lifecycles. Organizations should mandate the development of project-specific test strategies, detailed test plans, and documented acceptance criteria aligned with SAP Activate or equivalent best practices. Early-stage QA involvement must be institutionalized, with QA checkpoints embedded into project milestones.

Implementing structured defect management workflows, defining severity and priority matrices, and utilizing centralized test management tools (such as SAP Solution Manager Test Suite) can further strengthen the maturity of QA processes. Promoting a proactive approach to quality assurance rather than treating testing as a concluding task. This will enable earlier defect detection and improve overall delivery success.

5.4 Quantitative and Qualitative Project Delivery Outcomes

The third theme identified through the analysis focuses on the impact of quality assurance practices on both quantitative and qualitative dimensions of SAP project delivery success. Quantitative outcomes refer to measurable aspects such as project timelines, budget adherence, and defect rates, while qualitative outcomes encompass client satisfaction, user adoption, system usability, and the overall perceived quality of the delivered SAP solution.

Key Findings from Participants

Participants emphasized that the presence of a strong and structured QA process contributed significantly to the achievement of both quantitative and qualitative project success indicators. Several interviewees observed that projects with dedicated QA Engineers and early-stage testing activities experienced fewer schedule delays and budget overruns. Proper defect management and systematic test execution were directly linked to a reduction in costly post-go-live issues.

One Lead QA Engineer mentioned that,

“He (Functional Consultant) will find the possible changes that has to be done with the bapis and any other changes. Then those will be documented.”

At the interview, it was understood that the processes are less systematic. QA Engineers dependency on Function Consultants to identify scenarios lead to ad-hoc identification of test scenarios in later stages of the project.

Conversely, in projects where QA activities were ad-hoc or introduced late in the delivery cycle, participants reported an increased occurrence of critical defects escaping into production. These defects not only led to unplanned rework and budget escalations but also diminished client trust and user satisfaction.

One Team Lead highlighted below points,

“When we get the performance issues from the customer so that will impact the satisfaction of the customer as well as extra budget is required to do the later fixes”

Especially when it comes to Functional Consultants with lack of theoretical testing knowledge, testing estimations have become more out of the initial estimates.

“The testing of the functionality is there, but the regression they might have not understood how much regression is required, so it is not estimated”

One participant, a Lead SAP Consultant & a Team Lead, noted that even if a project was delivered on time, unresolved quality issues and poor user experience resulted in a negative perception of project success among end users and stakeholders.

“And we may not meet the timeline also because when we deliver it to customer expecting that we have done it, maybe customers had a different idea because of the communication gap, we didn't identify it and then they will put it to us as rework”

Another, Lead Consultant highlighted,

“Things we do later will, of course comes with a cost”

“But then obviously the satisfaction and the timeline, ultimately the satisfaction will be compromised because we think normally let's say for example, we think this this thing might go 5 days of testing effort, but it would be a 20 days effort. It can happen”

This highlighted the importance of not only meeting measurable targets but also ensuring high levels of customer satisfaction through quality assurance interventions.

Challenges and Limitations Identified

The main challenges identified under this theme include the **failure to consistently link QA effectiveness to project success metrics** and the **underestimation of qualitative outcomes** during project evaluations. Projects often prioritized timeline and budget over thorough quality practices, resulting in short-term gains but long-term issues with system reliability and user acceptance.

Furthermore, it was found that the absence of standardized mechanisms to track quality related KPIs, such as defect detection rates, test coverage, and user-reported issues limited the ability to demonstrate the tangible value added by QA activities to project leadership.

Opportunities and Recommendations

To strengthen both quantitative and qualitative delivery outcomes, it is recommended that **quality metrics be formally integrated into SAP project performance evaluation frameworks**. Metrics such as defect detection rate during different testing phases, defect leakage rate post go-live, user acceptance test (UAT) satisfaction scores, and system usability ratings should be tracked alongside traditional project KPIs like budget and timeline.

Moreover, active involvement of QA Engineers from the early stages can ensure that both technical and business quality expectations are clearly defined and validated throughout the project lifecycle. Initiatives such as continuous feedback loops with end users, post-implementation surveys, and defect trend analysis should be implemented to enhance qualitative success outcomes.

Embedding a culture where **both measurable results and user satisfaction** are considered essential indicators of success will lead to more sustainable SAP project outcomes.

5.5 Collaboration and Communication Dynamics

The final theme identified from the analysis emphasizes the critical importance of effective collaboration and communication between Functional Consultants, QA Engineers, and other key SAP project stakeholders. The findings revealed that communication gaps across teams significantly hindered the quality and timeliness of SAP project deliverables.

Key Findings from Participants

Participants consistently stressed that close collaboration between Functional Consultants and QA Engineers was essential when both roles were present within a project. However, it was highlighted that, in many cases, effective communication and coordination between these two groups were lacking. This disconnect often led to delays in defect identification, incomplete functionality testing, and misunderstandings regarding business process validations.

One Technical Team Lead stated below fact on QA Engineers,

“Delay, as well impact the timeline you have to depend on someone else”

“Then he must reach functional consultant. But again, he can't reach always, and he doesn't know.”

“The communication gap of all the lack of understanding of the requirement compared to functional consultant, as well as the lack of knowledge in SAP compared to functional consultant or whatever the amount required”

Also, it was noted, this communication gap was resulted by the knowledge gap as well. QA Engineers less SAP knowledge force him to work continuously without knowing when to reach the Function Consultants for the input.

Furthermore, the less understanding of the overall solution also leads to issues in projects.

Same Technical Lead stated below,

“The solution understanding. Gap can also lead to issues”

Furthermore, interviews revealed that communication challenges were not limited to QA and Functional teams alone. Gaps were also observed between different Functional Consultants themselves, such as between SAP SD (Sales and Distribution) and MM (Materials Management) consultants. Participants shared instances where misalignments between module-specific consultants resulted in inconsistencies across integrated business processes, ultimately affecting the quality of end-to-end testing and increasing post-go-live defects.

Same Technical Lead said,

“When there are two people in the same room so they can have two different understandings that might create a gap because you might test something that you think, but it may be different from what.”

Another Senior Consultant/Project Manager stated,

“Finally, we'll have to do the integration testing for that. All our people must get together. Then only the integration testing will be successful”

Another important finding was the need for Basis Consultants to actively participate in the quality assurance process. Participants indicated that Basis teams often did not adequately coordinate with Functional and QA teams to set up proper test environments. Without stable and realistic testing environments, QA Engineers and Functional Consultants faced additional barriers in validating SAP solutions effectively.

Challenges and Limitations Identified

The major challenges identified under this theme include the **lack of structured communication channels between QA Engineers and Functional Consultants and poor cross-module collaboration among Functional Consultants**. These gaps created fragmentation in testing efforts, delayed defect resolution, and compromised the completeness of business process validations.

Opportunities and Recommendations

To address these collaboration challenges, it is recommended that **formal communication and collaboration protocols** be established as part of SAP project management frameworks. Joint planning sessions, cross-functional workshops, and daily or weekly defect triage meetings should be mandated to foster stronger alignment between QA Engineers and Functional Consultants.

Additionally, integrated project schedules that reflect dependencies between SD, MM, and other functional modules should be created, ensuring synchronized efforts across different teams. Basis Consultants must also be involved early in the project lifecycle to provide stable and fully configured test environments that replicate production scenarios as closely as possible.

Promoting a culture of open communication, shared accountability, and cross-team visibility will not only enhance defect detection and issue resolution but also lead to a smoother, more efficient SAP delivery process.

5.6 Organizational Culture and Management Support

The fourth theme arising from the analysis relates to the influence of management decisions and organizational culture on the success of quality assurance practices in SAP projects. The findings revealed that management attitudes toward QA, clarity of team roles, and investment decisions significantly shaped the quality outcomes of SAP implementations and support activities.

Key Findings from Participants

Participants shared that management teams often encountered difficulties in recruiting Software QA Engineers with sufficient SAP expertise. It was observed that professionals with strong SAP configuration and business process knowledge typically preferred to pursue careers

as Functional Consultants, given the higher demand and more attractive compensation associated with those roles. As a result, there existed a shortage of QA Engineers with deep SAP specific knowledge, creating challenges in building effective quality assurance teams.

One Senior Manager stated below highlighting how difficult it is to hire the right talent.

“But the bigger problem is this. Now most of the time I have checked with my friends and all. What they are saying is also some, the people who are having the SAP knowledge don’t like to be a quality assurance person because they can earn a lot from the functional side”

“We couldn't find the right person. So that is why we don't have a QA manager here right now”

“it's difficult to find Quality Assurance manager with SAP knowledge. So, without that full knowledge, it's difficult to do the quality assurance part

Additionally, several interviewees highlighted the lack of role clarity for Functional Consultants. In many projects, Functional Consultants were reluctant to engage deeply in testing activities, perceiving them as beyond the scope of their formal responsibilities. This ambiguity frequently led to gaps in system validation and increased the risk of undetected defects progressing into production environments.

Management reluctance to allocate additional budget for dedicated QA resources was also consistently noted. To minimize project costs, organizations often assigned testing responsibilities to Functional Consultants instead of hiring specialized QA Engineers.

Same Senior Manager stated below,

“Because if you hire a person for the quality assurance you must pay for that, right? So, the cost is doubled.”

However, participants stressed that this approach compromised testing effectiveness, as Functional Consultants typically prioritized their configuration and delivery responsibilities over comprehensive testing.

Highlighting the above factor, another Senior Consultant stated below,

“Sometimes they will lose interest of doing the UAT because of the functional support calls”

Challenges and Limitations Identified

The major challenges identified under this theme include the **limited availability of skilled SAP QA Engineers, ambiguity in role definitions for Functional Consultants,** and **budgetary reluctance from management** to invest in dedicated QA resources. These factors collectively contributed to weakened quality assurance practices, inconsistent testing efforts, and increased delivery risks.

The lack of formal job descriptions for QA and Functional roles further exacerbated the confusion, leading to unclear accountability for system validation activities across project teams.

Opportunities and Recommendations

To overcome these challenges, it is recommended that **organizations develop clear and formal job descriptions** for both Functional Consultants and QA Engineers, explicitly highlighting responsibilities related to configuration, testing, and quality assurance. Establishing such clarity will ensure that all project stakeholders understand their respective roles in delivering high-quality SAP solutions.

Furthermore, management must recognize the strategic importance of quality assurance by **allocating dedicated budget and resources for QA activities.** While short-term cost savings might be achieved by avoiding dedicated QA hires, the long-term risks associated with poor quality, such as costly defect fixes, reputational damage, and user dissatisfaction always outweigh the initial savings.

Organizations should also invest in the development of existing QA Engineers, providing SAP-specific training pathways to address the current skills gap. Promoting a quality-driven culture, supported by leadership commitment and proper resource planning, is essential for improving project delivery success.

5.7 Summary

This chapter presented the findings of the study derived through thematic analysis of interview data. Five major themes were identified, providing a comprehensive understanding of the key factors influencing the role and effectiveness of Software Quality Assurance Engineers in SAP project delivery success within the Sri Lankan context.

The first theme, Skills and Competencies, highlighted the need for SAP specific knowledge among QA Engineers to bridge the existing competency gap. The second theme, QA Practices and Process Maturity, revealed inconsistencies in the application of structured quality assurance processes across projects. The third theme, Quantitative and Qualitative Project Delivery Outcomes, emphasized the importance of quality assurance in achieving both measurable results and client satisfaction. The fourth theme, Management Support and Organizational Quality Culture, underscored the impact of management decisions, resource allocation, and role clarity on QA effectiveness. Finally, Collaboration and Communication between QA and Functional Teams. Identified communication breakdowns as a significant barrier to efficient testing and quality delivery.

The findings collectively addressed the research objectives by identifying critical challenges and limitations, and by laying the foundation for proposing practical recommendations to strengthen the quality assurance approach within SAP project environments. The next chapter discusses these findings further, presents final conclusions, outlines specific recommendations, and highlights the study's limitations and avenues for future research.

CHPATER 06: CONCLUSION AND RECOMMENDATION

6.1 Introduction

This chapter shares the final reflections of the study by summarizing the key findings & discussing their importance. Then drawing conclusions based on the research objectives. The study focused on two case study organizations in Sri Lanka, both of which manage SAP projects through their own internal teams. Therefore, the recommendations are mainly aimed at similar organizations that run SAP projects using in-house resources rather than relying on external vendors. This chapter also outlines the study's limitations and suggests areas for future research to build a deeper understanding of quality assurance practices in SAP project delivery.

6.2 Discussion

The findings of this study provide important insights into the role and impact of Software Quality Assurance Engineers in SAP project delivery within the Sri Lankan context. Through thematic analysis, five key themes were identified: Skills and Competencies, QA Practices and Process Maturity, Quantitative and Qualitative Project Delivery Outcomes, Management Support and Organizational Quality Culture, and Collaboration and Communication between QA and Functional Teams.

The first research objective sought to identify the challenges and limitations faced by Software QA Engineers and Functional Consultants. The findings clearly revealed that a significant skills gap exists among QA Engineers, particularly in the areas of SAP configuration knowledge and business process understanding. While Functional Consultants were found to possess strong domain expertise, QA Engineers often lacked the SAP specific knowledge required to conduct comprehensive and meaningful quality assurance activities.

Additionally, the maturity of QA practices emerged as a critical determinant of delivery success. Projects that lacked structured QA processes, formal testing strategies, and early defect prevention measures faced increased quality risks, delayed deliveries, and higher costs. These findings support best practice frameworks such as SAP Activate, which advocates for structured quality assurance integration throughout the project lifecycle [15].

The second objective focused on providing recommendations to improve the QA perspective on SAP delivery processes. The findings highlighted the need for formal role definitions, structured QA methodologies, and stronger management commitment to quality assurance investments. It became evident that management's reluctance to hire dedicated QA Engineers, combined with ambiguous Functional Consultant responsibilities, led to inconsistencies in testing coverage and accountability gaps.

Furthermore, collaboration and communication breakdowns were found to significantly affect SAP project quality. Not only was there insufficient collaboration between QA Engineers and Functional Consultants, but misalignments were also noted between different Functional

modules such as SD and MM. This fragmentation of effort resulted in incomplete end-to-end testing and integration defects, reinforcing the importance of cross-functional team coordination for ERP project success.

An important reflection arising from the study is the compounded effect of organizational culture and management practices on quality outcomes. In organizations where quality assurance was treated as a secondary concern, QA efforts were ad hoc, under-resourced, and reactive. In contrast, where management actively supported quality initiatives, better testing discipline, defect management, and project outcomes were observed.

Overall, the study's findings suggest that enhancing SAP project delivery success in Sri Lanka requires a strategic rethinking of how QA is positioned within the project structure. It is not sufficient to rely solely on Functional Consultants for testing, nor is it effective to introduce QA activities late in the project lifecycle. Instead, organizations must invest in building SAP-specific QA competencies, institutionalize structured QA processes, clarify role boundaries, and foster an integrated, communication-rich project environment.

By addressing these areas, organizations can significantly reduce project risks, improve delivery predictability, and enhance client satisfaction. Thereby achieving both quantitative and qualitative SAP project delivery success.

6.3 Conclusion

This study explored the impact of the Software Quality Assurance Engineer role on SAP project delivery success within the Sri Lankan context, focusing on the challenges, limitations, and areas for improvement. Through qualitative analysis of in-depth interviews, five key themes were identified that collectively shaped the understanding of the research problem.

The findings confirmed that while Functional Consultants possess strong SAP configuration and business process knowledge, Software QA Engineers often lack these competencies, affecting their ability to conduct comprehensive testing activities. Additionally, inconsistencies in QA practices and process maturity across projects were observed, leading to varied project outcomes. Management support and the organizational culture surrounding quality assurance were found to have a significant influence on QA effectiveness, with resource constraints and role ambiguities being notable barriers. Communication gaps between QA Engineers, Functional Consultants, and Basis teams were also identified as key contributors to quality assurance challenges.

Overall, the study concludes that the successful delivery of SAP projects is highly dependent on the establishment of clear QA roles, investment in SAP specific QA skills, adoption of structured QA methodologies, and fostering of an integrated, collaborative project environment. Organizations that prioritize and invest strategically in quality assurance practices are better positioned to achieve both quantitative and qualitative success in their SAP project initiatives.

6.4 Recommendations

The following recommendations are based on findings from two case studies carried out in Sri Lankan SAP project environments. They aim to strengthen the role of Software Quality Assurance (SQA) Engineers, improve the testing skills of Functional Consultants and enhance overall QA practices in project delivery. While these insights offer practical value, it's important to note that they reflect specific project contexts and may not fully represent the broader landscape of SAP implementations across Sri Lanka.

Enhance SAP-Specific Competency Development for QA Engineers

Organizations should invest in specialized training programs aimed at improving the SAP-specific knowledge of Software QA Engineers. Training should focus on SAP configuration fundamentals, business process flows, ERP-specific testing techniques, and end-to-end scenario validation. Practical exposure to SAP projects and structured certification programs can bridge the current competency gaps and equip QA Engineers to design more effective test strategies.

Define Clear Roles and Responsibilities for QA and Functional Teams

It is recommended that formal role definitions be established for both Software QA Engineers and Functional Consultants within SAP project teams. Responsibilities related to system testing, business process validation, and defect management must be clearly delineated through job descriptions and project governance frameworks. Clarifying accountability will reduce overlaps, minimize confusion, and ensure systematic quality assurance activities.

Institutionalizing Structured QA Practices Across SAP Projects

Adoption of standardized quality assurance methodologies should be mandated across all SAP initiatives. Frameworks such as SAP Activate should be referenced to develop project-specific QA plans, acceptance criteria, and structured defect lifecycle management procedures. QA activities must be integrated from the early stages of the project lifecycle to promote proactive defect prevention and early validation of business requirements.

Strengthening Testing Capabilities of Functional Consultants

In projects where Functional Consultants are required to participate in testing activities, targeted interventions should be introduced to enhance their testing effectiveness. Functional Consultants should be trained on,

1. Designing test cases based on business requirements
2. Validating end-to-end business processes across integrated modules
3. Identifying and logging defects using standard defect tracking tools
4. Preparing structured test documentation, including test scripts and result logs

Providing formal testing methodology workshops and practical testing checklists will enable Functional Consultants to contribute more systematically to the overall quality assurance efforts, particularly when dedicated QA Engineers are unavailable.

Foster Cross-Team Collaboration and Communication

Cross-functional collaboration between QA Engineers, Functional Consultants, Basis teams, and technical teams must be actively promoted. Initiatives such as joint requirement validation workshops, regular defect review meetings, and synchronized integration testing sessions should be institutionalized to bridge communication gaps and ensure alignment across teams. Enhanced collaboration will improve issue identification, accelerate resolution times, and strengthen project quality outcomes.

Promote Management Commitment to Quality Assurance

It is critical that senior management recognizes quality assurance as a strategic priority within SAP project governance. Sufficient resources, including dedicated QA personnel and appropriate budget allocations, must be planned from the project initiation phase. Management should actively champion early QA involvement, structured testing practices, and continuous improvement in quality assurance maturity to drive project success.

Implement Quality-Focused Project Metrics and Monitoring

In addition to traditional project management KPIs such as timelines and budget adherence, quality-focused indicators should be tracked systematically. Metrics including defect detection rates, defect leakage rates, user acceptance satisfaction scores, and test coverage levels must be incorporated into project dashboards. Regular review and analysis of these metrics will enable proactive risk management and continuous quality improvements throughout the SAP project lifecycle.

By implementing these recommendations, organizations can significantly enhance the effectiveness of quality assurance practices, strengthen testing contributions across project teams, and increase the overall success rates of SAP project deliveries in Sri Lanka.

6.5 Limitations of the Study

While this study provides valuable insights into the impact of the Software Quality Assurance Engineer role on SAP project delivery success in Sri Lanka, several limitations must be acknowledged.

Firstly, the study was conducted using a qualitative research approach, primarily based on in-depth interviews. Although rich context-specific data were collected, as the study focused on a specific group of SAP project stakeholders within two Sri Lankan organizations, the ability to generalize the findings is constrained.

Secondly, the study was limited to participants involved in SAP support, implementation, and rollout projects. Other dimensions of SAP projects, such as large-scale transformation

programs, cloud-based SAP deployments, or SAP upgrades, were not deeply explored, potentially limiting the applicability of the findings to these specialized scenarios.

Thirdly, the perspectives gathered were predominantly from functional, quality assurance, and project management roles. Limited input was obtained from Basis, infrastructure, and senior executive management layers, which might have offered additional insights into broader organizational quality assurance practices.

Finally, the study focused primarily on challenges and improvement areas within the Sri Lankan SAP project context. Specific cultural, organizational, and market dynamics unique to Sri Lanka may influence the findings, and caution should be exercised when applying the recommendations to different national or regional environments.

Despite these limitations, the study offers a meaningful contribution to understanding quality assurance roles within SAP projects and provides a foundation for further research in this domain.

6.6 Future Works

This study has highlighted several areas where further research could expand and deepen the understanding of quality assurance practices within SAP project environments.

Firstly, future studies could explore the impact of Software Quality Assurance Engineer roles in a **comparative international context**. Investigating SAP projects across different countries or regions would enable a broader analysis of how cultural, organizational, and market differences influence quality assurance effectiveness.

Secondly, while this study adopted a qualitative research approach, future research could employ **quantitative or mixed methods designs** to measure the statistical significance of the relationships between QA involvement, defect rates, budget adherence, and project delivery timelines. Large-scale surveys and case studies could provide further validation of the themes identified in this research.

Thirdly, further studies could focus on the **evolving role of QA Engineers in cloud-based SAP deployments**, such as SAP S/4HANA Cloud or SAP Rise with S/4HANA projects. As cloud environments bring new testing requirements, integration complexities, and faster delivery models, understanding how QA practices adapt in these contexts would be valuable.

Finally, future research could investigate the **cost-benefit analysis of investing in dedicated QA resources** compared to using Functional Consultants for testing activities. Such studies would provide empirical evidence to guide management decision-making regarding resource allocation for quality assurance in SAP projects.

By pursuing these future research directions, scholars and practitioners can build a deeper and more comprehensive understanding of quality assurance's critical role in successful SAP project delivery, ultimately contributing to the advancement of best practices in ERP system implementations.

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Annexure A: Questions used in the interviews

General Background

Can you briefly introduce yourself and describe your role in SAP projects?

How many years of experience do you have in Software Quality Assurance (SQA) within SAP projects?

What type of SAP projects have you worked on? (Implementation, Rollout, Support)

For Project Managers and Team Leads

Project Scope and Complexity:

Can you describe the typical complexity and scope of SAP projects your team handles?

How do you ensure quality in your current SAP projects?

Quality Issues and Impact:

What are some common quality issues you've encountered in SAP projects?

How have these issues impacted project timelines, costs, and client satisfaction?

Quality Assurance Practices:

What quality assurance practices are currently in place for SAP projects?

How do you think having a dedicated QA engineer would impact on these practices?

Cost-Benefit Analysis:

Have you conducted any cost-benefit analysis regarding the inclusion of QA engineers in your projects?

What are the expected benefits of having a QA engineer specifically for SAP projects?

For Developers and Technical Staff

Current Testing Processes:

Can you describe the current testing processes for SAP projects?

Who is primarily responsible for testing within your team?

Challenges in Testing:

What challenges do you face in ensuring the quality of SAP implementations?

How do you handle bug fixes and regression testing currently?

Need for Specialized QA:

In your opinion, would having a specialized QA engineer improve the quality and efficiency of SAP projects? How so?

What skills and expertise should a QA engineer have to effectively contribute to SAP projects?

For Existing QA Engineers (if applicable)

Role and Responsibilities:

Can you describe your role and responsibilities in the context of SAP projects?

How do you collaborate with other team members to ensure quality?

Impact and Effectiveness:

What impact have you seen from having a dedicated QA role in SAP projects?

Can you share any specific examples where QA interventions significantly improved project outcomes?

For Clients and End Users

Quality Expectations:

What are your quality expectations for SAP implementations?

Have these expectations been met in previous projects? Why or why not?

Experience with QA:

Have you noticed a difference in project quality when there is a dedicated QA engineer involved?

How important is the role of QA in your satisfaction with the final SAP product?

Feedback on Quality:

Can you provide examples of any quality issues that affected your use of SAP systems?

How would you rate the overall quality assurance efforts in your recent SAP projects?

For Industry Experts and Consultants

Industry Standards:

What are the industry standards and best practices for quality assurance in SAP projects?

How does the presence of a QA engineer align with these standards?

Market Trends:

What trends are you observing regarding QA roles in SAP projects in Sri Lanka and globally?

Are more companies investing in dedicated QA roles for SAP projects? Why or why not?

Recommendations:

Based on your experience, what recommendations would you give to companies in Sri Lanka regarding QA for SAP projects?

What key skills and qualifications should a QA engineer possess to be effective in SAP projects?

Annexure B: Thematic Analysis Categorization

Initial Codes	Sub Themes	Themes
QA role clarity	Technical Skills	Skills & Competencies
Responsibilities overlap	Business/Functional Skills	
SAP standard practices & tools		
Domain knowledge	QA Practices & Process Maturity	QA Practices and Process Maturity
Technical knowledge (SAP-specific knowledge)		
QA experience		
Functional Consultant involvement in testing		
Defect detection efficiency	Collaboration and Communication	Collaboration and Communication Dynamics
QA contribution to risk mitigation		
Impact on timeline	Impact on Project Delivery	Quantitative and Qualitative Project Delivery Outcomes
Impact on budget		
Impact on client satisfaction	Management and Cultural Factors	Organizational Culture and Management Support
Communication gaps	Role Definition and Clarity	
Test documentation practices	Challenges	
QA standards and guidelines adherence		
Test automation skills		
Proactive defect prevention		
Quality culture within SAP teams		
Training and skill development		
Challenges faced by QA in SAP Testing		
Testing tools utilization		
Understanding of business processes		
Issues resolution efficiency		
Team collaboration effectiveness		
Impact of dedicated QA presence		
Perceived value of QA role		
Resistance towards QA interventions		
Defect leakage and post-go-live issues		
Project phase-specific QA		
Feedback loops effectiveness		
Management support for QA		
Challenges faced by FC in SAP Testing		

QA-mediator between tech and functional teams