Continuous Integration Approach of Risk-Based Testing using Service Oriented Architecture

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Abstract **-** In trending Information Technology services, Service Oriented based approach has removed the gap between services rendered to a product and their client needs. In current trend, there is a business change transitions between software organizations and service base data innovation model. Hence, testing is vital for SOA based applications.
In this paper, the researcher investigates how the Risk Based testing problems using SOA based services integrated with Agile. we introduce a new approach, continuous integration of services in product development for both Web and Mobile, to perform a research-based study to identify the Risks, the approach, and perform feasible study and value gained.
A Product Implementation of web services and extend the implementation in Mobile to support in Multiple platforms. Let us discuss in detail on how an Organization strategizes the approach to meet the demand of clients and meet the deliverables without any delay using continuous Integration in Agile Methodology. There are Multiple Risks involved like having skilled professional with right Technical, Functional and Industrial skills involved from Design to Deployment of the application.

Keywords **-** software testing; counterfeit deficiencies; testing productivity; Generation testing, programmed experiment generation

I. INTRODUCTION

SOA gives answers for integrating various diverse frameworks that help interoperability, Integrity and reuse. To meet client's requirement, web services adapted to Mobile Application services It is important that there are approached to meet such requirements. This emerging and versatile condition of SOA invokes many queries to meet the demands without compromising on quality and needed services offered by product. In this way, testing is felt essential for SOA based application.
Service Oriented Architectures (SOAs) is helpful in reducing the gap between software development and delivery to Market. Powering that development is the accessibility of versatile software benefits that can be cost-effi cient made with different services to give more extravagant useful application. The reasons that make these frameworks simpler to implement, in any case, additionally make them all the more testing to test. Interdependent software services more often than not give only a medium of interaction, sufficient knowledge to integrate these modules and build up high level tests, not adequate knowledge of skilled professionals to build up a satisfactory software services with expected quality in the product and interdependent services for web-based project.
To fulfil this need we recommend another vital way to deal with have programming administrations progressively straightforward through the expansion of a middle spread age administration.
Let us address some of the Risks involved. Verification and validations to be performed between various modules of the product and the services rendered to end users in an inter-active approach. In SOA testing, special testing conditions to be considered as the mobile applications are used offline, independent on network conditions and support multiple users concurrently.
SOA testing can be tested through online by collecting the data randomly and test it's functionalities. Endurance testing is also performed to ensure that the applications resists with dynamic activities performed by users.
Let us study by taking an example, its problematic area, and its evolution at every stage and proposing some solutions at every phase and deliver it successfully.

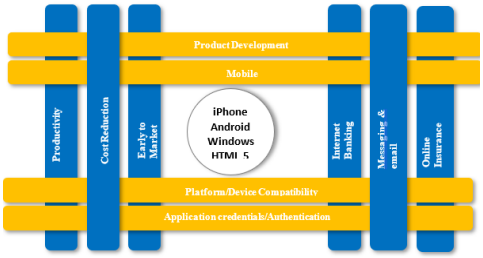


Figure 1: New Project requirement

II. REVIEW OF LITERATURE

Consider the above scenario, that a new product must be developed which is first implemented as web services, and then extend the product to mobile users.
The Application requires, Login Credentials and certifications to trust the end users of the applications.
The Product is expanded into 3 functionalities

1. Internet Banking
2. Online Insurance
3. And Email and Messaging features.

We will have to analyze the Risks involved in Product development and Mitigate the Risks, implement Continuous integration process in Product development, with SOA and Agile methodology

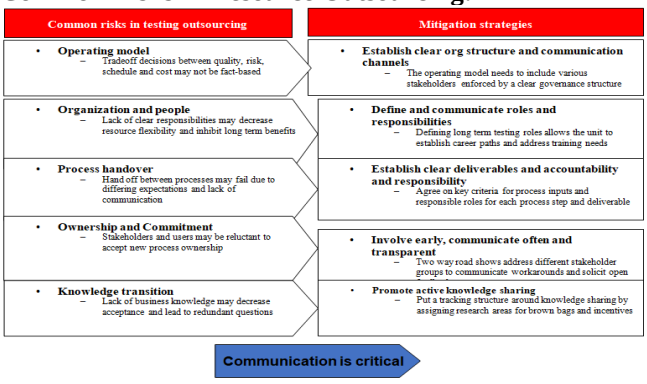
Risks involved in Product development and Mitigation Plan:

Table 1: Risks analysis involved while taking up new assignment

Sl. No	Risk	Probability	Mitigation	Buffer Time at every Phase	Hours
1	Transactions execution through Web Services have never been used, so there is a chance of finding some defects	High	Maintenance team is responsible for the resolution of the defects found. But those defects could delay the project build and tests.	(Build & Test) 20%	567
2	The Java version used in the prototype and high level analysis is not the same that is going to be used for the integration project.	Medium	Estimation will be revisited once the Reference Version is available, so contingency is assigned for analysis and design phases.	(Analysis and Design) 15%	425
3	Internet Banking is a new application not installed in any client by the moment, so there is a chance of finding some defects.	High	Internet Banking Maintenance team is responsible for the resolution of the defects found. But those defects could delay the project build and tests.	(Build & Test) 20%	567
4	Backend environment availability problems could lead to schedule and cost deviations	Medium	Synchronize with IT and current teams working in such environment, to avoid critical updates.	15%	425
5	Currently there are no PDC performance-skilled resources available.	Medium	Resources with the required skills are being searched. Monitor and prioritize tasks based on Harvesting delivery dates.	15%	425
6	Product Tests and preparation for Performance Tests are executed in parallel, so defects found could require rework.	Medium	Synchronize both tasks, and prioritize functions when creating scripts and data for performance tests, starting with proven ones to minimize defects impact.	15%	425

Based on the above risks, Resources involved in every phase of product development has to be skilled resources, where the development from initial design to deployment has to be handled on time, and considering the above risks, There is also an option of outsourcing the test resources which again involves multiple risks as mentioned below.

Common Risks in Resource Outsourcing:



III. METHODOLOGY

Hence to deal with such situations, the delivery model of Software Oriented Architecture is proposed to have a combination of SOA along with Continuous Integration concept in Agile Methodology,

The Resource capability driven

1) with previously trained resources on multi skills
2) resources trained after signing a new product delivery, which is time consuming and can cause delay in product delivery,

The skills needed for a delivery is of

1) Technical,
2) Functional
3) Industry.

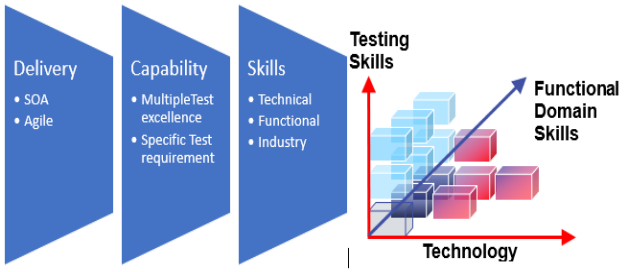


Figure 2: Skills to deliver a project

SOA Service

- SOA Architecture is the concept applied, when the services are developed and continuously Integrated.
- SOA does not consider the fact on how the application is developed, rather it tests the services rendered by the application.
- SOA is a process methodology that can be applied or used as a reference and not a rule.
- SOA is a guidance plan.
- SOA architecture is proven and is used across for multiple years.

IV. AGILE DELIVERY MODEL

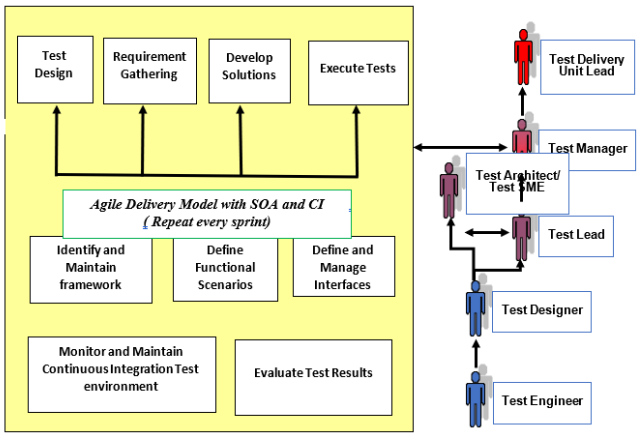


Figure 3: Continuous Integrations and delivery using Agile and resources involved

End to End flow with an Example: The below diagram depicts how a project is carried from initial phase that involves resource gathering, Knowledge development, Developments, Test, deploy and deliver the product.

Figure 4: Project flow

V. RESULTS

To have a right set of Test environment also requires right skillset to setup the environment.

The below graph shows the time taken to have the environment ready compared to the initial estimates.

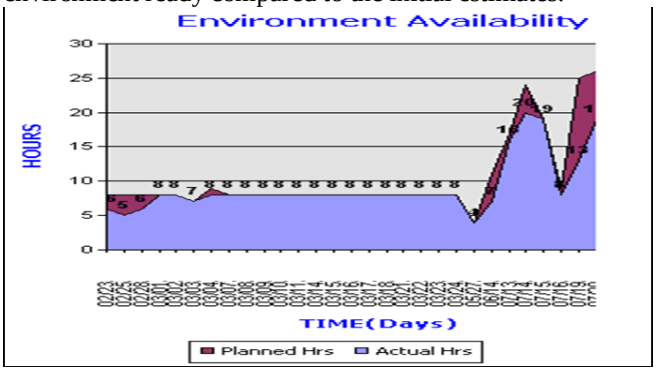


Figure 5: Environment readiness

Test Results of the above product:

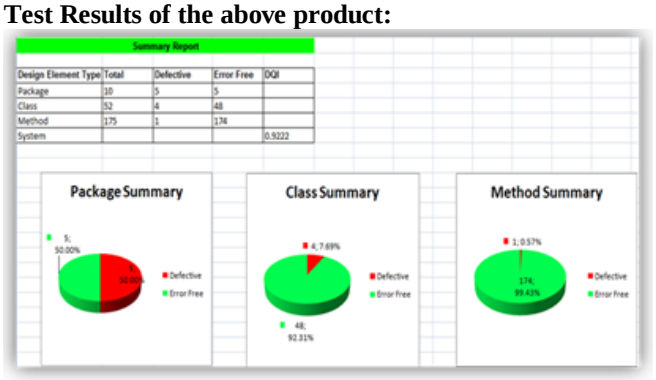


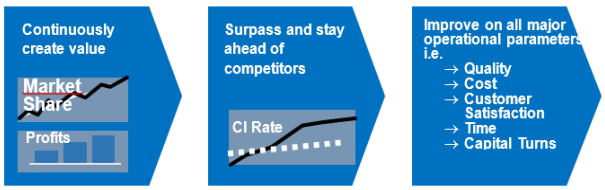
Figure 6: Test result analysis

VI. CONCLUSION

The combined approach

- Systematically combines the software functionalities across an organization to achieve continuous change and incremental testing progressively adding value to the end user and clients.
- Identifies and eliminates redundant work and saves time, without compromising in Quality outcome, to drive cost and capital efficiencies simultaneously
- Incremental change becomes an attribute of individual behavior and part of an organization's culture

Continuous Integration Testing with SOA in Agile allows:



Benefits of Continuous Integration:

- Increase Unit-Testing.
- Improve product documentation.
- Calibrate Agile development approach
- Improve build environment

- Prepare for continuous integration
- Increase code reuse – Common Java Platform
- Building reusable testing framework

VII. REFERENCES

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