INTERNATIONAL JOURNAL OF RESEARCH IN COMPUTER APPLICATION & MANAGEMENT

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CONTENTS

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iii

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       STATEMENT OF THE PROBLEM

       OBJECTIVES

       HYPOTHESES

       RESEARCH METHODOLOGY

       RESULTS & DISCUSSION

       FINDINGS

       RECOMMENDATIONS/SUGGESTIONS

       CONCLUSIONS

       SCOPE FOR FURTHER RESEARCH

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- Bowersox, Donald J., Closs, David J., (1996), "Logistical Management." Tata McGraw, Hill, New Delhi.
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- Kumar S. (2011): "Customer Value: A Comparative Study of Rural and Urban Customers," Thesis, Kurukshetra University, Kurukshetra.

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- Garg, Bhavet (2011): Towards a New Natural Gas Policy, Political Weekly, Viewed on January 01, 2012 http://epw.in/user/viewabstract.jsp

SCRUM IN AGILE TESTING

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ABSTRACT

Software testing is a very important process to verify the software quality. Agile techniques may produce software faster as well as enhance software quality so that they fulfill quality requirements of the product. This paper describes scrum methodology in agile testing methodologies and scrum process in software testing

KEYWORDS

Software Testing, Agile, Scrum.

INTRODUCTION

In the world of software development, the term agile typically refers to any approach to project management that strives to unite teams around the principles of collaboration, flexibility, simplicity, transparency, and responsiveness to feedback throughout the entire process of developing a new program or product. And agile testing generally means the practice of testing software for bugs or performance issues within the context of an agile workflow.

WHAT IS AGILE?

The Agile movement proposes alternatives to traditional project management. Agile methods are typically used in software development to help industries respond to unpredictability.

WHY AGILE?

Most of the industries or organizations are working to produce best software product in less time. To reach this goal, many companies are adopting agile method. This approach can help accelerate time to market, enhance software quality, increase productivity, and improve alignment between technology and business objectives.

SCRUM IN AGILE PROCESS

Scrum is a lightweight process framework for agile development, and the most widely-used one.

- A "process framework" is a particular set of practices that must be followed in order for a process to be consistent with the framework. (For example, the Scrum process framework requires the use of development cycles called Sprints, the XP framework requires pair programming, and so forth.)
- "Lightweight" means that the overhead of the process is kept as small as possible, to maximize the amount of productive time available for getting useful work done.

ROLES OF SCRUM

Three different roles of scrum are explained below

A. *Product Owner*: In Scrum, the Product Owner is responsible for communicating the vision of the product to the development team. He or she must also represent the customer's interests through requirements and prioritization. Because the Product Owner has the most authority of the three roles, it's also the role with the most responsibility. The Product Owner is the single individual who must face the music when a project goes away.
B. *Scrum Master*: The Scrum Master acts as a organizer for the Product Owner and the team. The Scrum Master does not manage the team. Instead, he or she works to remove any weaknesses that are blocking the team from achieving its sprint goals. In short, this role helps the team remain creative and productive, while making sure its successes are visible to the product owner.
C. *Team Member:* In the Scrum methodology, the team is responsible for completing work. Ideally, teams consist of seven cross-functional members, plus or minus two individuals. For software projects, a typical team includes a mix of software engineers, architects, programmers, analysts, QA experts, testers, and UI designers. Each sprint, the team is responsible for determining how it will achieve the work to be completed.

TERMINOLGIES IN SCRUM

A. *A* **Product Backlog** of prioritized work to be done.
B. Whole product backlog items are divided into fixed set of items called **Sprints**.
C. **Burn down charts** is a graph which shows the estimated effort v/s actual effort of the scrum chart. Scrum emphasizes the notion of seeing work reduce over the life of the sprint as a fundamental metric for progress.
D. **User Story** is nothing but the requirements or feature which has to be implemented.
E. **Epics** are user stories which are not defined and kept for future sprints.
F. **Sprint Backlog:** Based on the priority, user stories are taken from the Product Backlog one at a time. The Scrum team turns on it, determines the feasibility and decides on the stories to work on a particular sprint. The collective list of all the user stories which the scrum team works on a particular sprint is called s Sprint backlog.

SCRUM-PROCESS OVERVIEW

A. **A Sprint Planning Meeting** where the Sprint Backlogs are split with the team members.
B. **Execution of Sprint Tasks** the actual work done by the scrum team to complete their task and take the user story into the "Done" state.

C. **Daily scrum meeting** is organized to discuss three key points: They are
    a.   what are activities has been done since last meetings,
    b.   what are the activities to be done until next meeting and
    c.   Impediments if any.
D. **A Sprint Review Meeting** where the team members demonstrate implemented work to the product owner. Product owner cross verify the work done by the team members as per its acceptance criteria.
E. **A Sprint Retrospective Meeting** happens after the review meeting. Scrum team meets and discusses the following points in this meeting.
    a.   What went well during the Sprint
    b.   What did not went well in the Sprint
    c.   Lessons learnt
    d.   Action Items.

PRE-REQUISITE SOFT SKILLS FOR A SCRUM TEAM

A. **Cross functional Team work** is at the heart of Scrum. There is no "my work", "I have finished my work" and "your work". On a Scrum team we find only **"Our work", "we have completed our Sprint"**. Individuals will have helping tendency for sharing technical knowledge. Scrum Members are always available to team members rather than locked away behind closed doors. Scrum Master will always motivate the teams and create a Supporting learning environment

B. **Communication:** Good communication must exist among team members of development team, testing team, business analysts and stake holders. There must be highly **collaborative interaction between client and the delivery teams**. More client involvement implies more suggestions or changes from the client. It implies more bandwidth for communication.

C. **Commitment:** Agile Teams needs **periodic re-energizing** to renew their commitments to their purpose and to each other. Scrum Masters can help by ensuring that the team embraces the concept of **whole-team responsibility and whole-team commitment** to deliver working software at the end of each sprint. With the whole-team commitment, the team member who has completed his tasks will help the one who has not completed so that hopefully each finishes on time.

D. **Problem Solving:** Scrum does not simply focus on developing just any type of end product. Instead, the Scrum method allows the team to focus on **creating a product that fulfills the customer's highest value priorities** which are defined by product owners.

E. **Transparency:** Transparency **among team members and management** gives a real momentum to the scrum team. Scrum Master encourages people to ask for help, surface roadblocks, and give public recognition for those brave enough to do so. At the same time, Scrum Master also understands the time wasted and impact on the team when individuals sit on or ignore problems.

SCRUM IN TESTING

Scrum Testing refers to testing practice that follows agile manifesto mainly to implement testing in projects using Agile Methodology. Scrum in Testing can be leveraged as follows:
- Support iterative testing
- Backlog, sprint goal driven, team orchestrated
- Measured (burn down) progress to goal
- Daily meetings
- Derive clarity with stakeholders for testing focus, sequence and outcomes
- Simple PM model – team led, not command led

Scrum in testing can be implemented as follows:
- As part of backlog task defined in overall sprint backlog where members from cross-function form team.
- In Independent testing activities like lab setup, test suite automation.

TESTING WORKFLOW IN SCRUM

The role of tester will include testing software in "QA environment", while developers are still doing unit tests in their environment which is not as close to production one.

FIG. 1
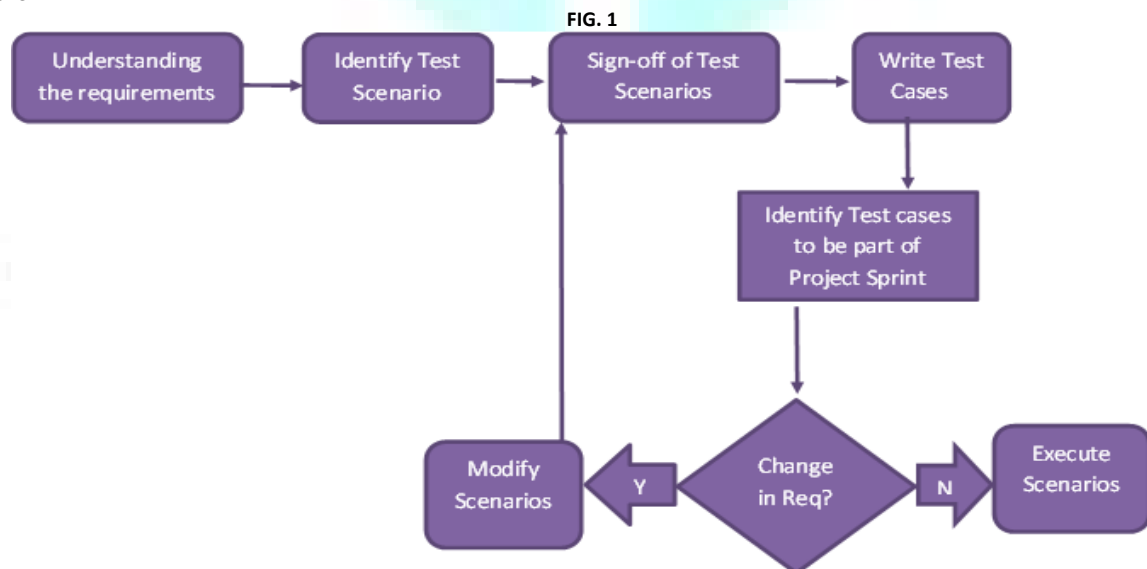
Below points discuss in brief flow shown in above diagram:
- Identify the scenarios based on requirement document.
- Obtain sign-off of test scenario document from business owners.
- Write test cases for signed-off scenarios.

- For each sprint identify set of test cases.
- Execution should be done on the concept of delaying of sprint which implies when sprint 2 functionalities are under development; sprint 1 functionalities would be tested.
- To avoid any gap or delay for any major issues in current sprint because of concept of delayed testing in sprint, smoke test cases should be executed on current sprint to give go ahead to functionalities developed in current sprint.
- A change in requirement or defect would be added to product backlog.
- A constant regression bed is identified for all the completed sprints.

QUALITY ASSURANCE ACTIVITIES IN SCRUM

Most common quality assurance activities that are being practiced in companies working in Scrum are
A. Unit Testing
B. Continuous integration
C. Regular sprint meeting
D. Regular daily meeting
E. Strict to coding and design standard
F. Acceptance testing
G. Test automation
H. Exploratory Testing

TESTING ACTIVITIES DURING SPRINT CYCLE

Daily Scrum Meeting Activities are given below as Sprint cycle.
I. **Testing Tasks in Sprint-1**
    A. Identify Test Scenarios
    B. Get Business Sign-off
    C. Write Complete Test Cases.
    D. Identify Test Cases & prepare Test Data for Sprint 1 functionality
II. **Testing Tasks in Sprint-2**
    A. Identify Test Scenarios for changed requirements
    B. Get Business Sign-off and write test cases
    C. Execute Test Cases identified in sprint 1
    D. Report Bugs and verify fixed ones.
    E. Identify Test Cases & prepare Test Data for Sprint 2 functionality
III. **Testing Tasks in Sprint-3**
    A. Identify Test Scenarios for changed requirements
    B. Get Business Sign-off and write test cases
    C. Run Regression Suite on major sprint 1 functionalities.
    D. Execute Test Cases identified in sprint 2
    E. Report Bugs and verify fixed ones.
    F. Identify Test Cases & prepare Test Data for Sprint 3 functionality
IV. **Last Development Sprint**
    A. Identify test cases
    B. Prepare Test Data
    C. Run Regression Suite on major sprint 2 functionalities.
    D. Execute Test cases identified for sprint 3
    E. Report Bugs and verify fixed ones.
    F. Execute last development sprint test cases.

CONCLUSION

Important things in the scrum methodologies are iterative lifecycle and frequent communication with the customer. In testing part following points emphasize and summarize important aspects of scrum testing methodology:

- Test within each iteration, rather than at the end of a development lifecycle
- Decide what to test when a product is still unfinished
- Collaborate with team members rather than working in isolation
- Participate in daily status meetings that are a maximum of 15 minutes long
- Seek product information individually through testing

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