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Gamification in Crowdsourced Testing

In the era of internet and mobile, many applications are customer-centric and are accessed by users from different geographic locations with different levels of computer literacy. Though these applications are thoroughly tested by dedicated testers in the IT team, there is a possibility that some of the issues are overlooked and testers have the challenge of finding issues related to user experience because of the unavailability of testers from different cultural backgrounds. Another challenge which the IT team faces when building these software applications is to ensure that the application runs seamlessly on different devices. Technology is evolving at a faster pace and new OSs, browsers, and mobile devices are released every other week with different software and hardware specifications. Testing an application's compatibility on various devices with different browsers is next to impossible because of the non-availability of a wide range of devices to test, and the high cost of setting up the lab and deploying the human resources. Crowd sourcing this testing activity can help to address some of the challenges, such as getting users from different geographies and testing on multiple devices for compatibility.

Crowd source testing has been gaining lot of momentum in recent times because of the value generated by the crowd which cannot be achieved with an internal testing team. Crowd testing is not a replacement for traditional testing, but it provides good value when the right crowd is chosen and it is ensured that the crowd participates in testing actively and covers all parts of the application. Though there are quite a few benefits when it comes to cost, flexibility, diversity of testers, and timelines, crowd testing also has its own challenges in the form of motivating testers to test, increasing the depth of testing coverage, and rewarding the right testers. Gamifying the crowd-sourced testing activities can help to address some of the challenges faced in crowd source testing.

Crowd source testing

Crowd source testing is the process of obtaining testing services from a group of people who are distributed across geographies with different skill levels. Crowd testing is not a replacement for traditional testing, but an additional round of testing done by people who are not directly involved in the project, are representative of end users from different geographical and cultural backgrounds, and who can perform exploratory testing, identify defects, and provide user experience feedback. Crowd-sourced testing is more suitable for user-centric applications such as online e-commerce sites, mobile applications, and games.

The benefits achieved by adopting crowd source testing are:

- Faster turnover because of the high number of testers involved.
- Ability to unearth different compatibility issues by leveraging the different OS, browser, and device combinations used by crowd testers.

- Low cost, as payment is based on the number of defects identified instead of the effort spent on the application under test.
- Testers from different geographical locations can help in identifying any localization defects.

The challenges faced during crowd source testing are:

- Coverage: No control over what is being tested by the crowd.
- Coverage: Driving the crowd to test critical tests instead of less critical tests.
- Coverage: Having the crowd test untouched areas to ensure complete coverage.
- Motivation: Motivating testers to continue testing without getting distracted.
- Consistency: Consistent involvement of crowd across the test schedule.
- Quality: High number of duplicate defects or no defects raised.

Gamification

Gamification is a business strategy which applies game design techniques to non-game experiences to drive user behavior. Gamification can be applied to solve various problems by creating fun and engaging experiences, and converting users into players.

How gamification can help:

- Motivates users by providing a fun experience and engaging them to become involved and derive maximum benefit.
- Creates healthy competition between users to gain high productivity.
- Engages users in desired behaviors to solve problems.
- Encourages users to perform boring repetitive activities.

Gamification in crowd testing

The objective of having gamification in crowd testing is to engage crowd testers and motivate them to spend more time in identifying the defects, creating a fun environment and having a healthy competition between testers so that we get maximum benefit from testers and gain confidence that we have obtained the maximum test coverage.



Some of the gamification techniques which can be used to overcome the challenges in crowd source testing are:

- Leaderboard
- Challenge of the day
- Quizzes
- Bonus scoring

How gamification techniques address the crowd test challenges

Leaderboard

Leaderboard is the concept of publishing stats in the portal and highlighting the top five or ten testers (who have scored more number of points), the flash top scorer of the day, the best defect raiser, etc.

This is similar to how a leaderboard is published in games where the top gamers are displayed by rank and badges are given to toppers. This technique creates healthy competition between the testers, and encourages them to get increasingly involved and perform various test activities which can help increase their score and get to the top of the leaderboard.

This technique will help to address the following challenges:

- Motivating testers to continue testing without getting distracted.
- Consistent involvement of the crowd across the test schedule.

When to use this

This technique should start from the beginning of crowd testing and the leaderboard should be published at regular intervals (on a daily or twice-weekly basis) in a portal where testers can check their rank and see what takes them to move up the board.

Challenge of the day

Challenge of the day is the concept of posing a challenge to testers to identify defects in a particular module of the application under test.

In the gaming world, challenge of the day helps gamers to gain more points away from the regular game levels. Similarly in crowd testing, testers can focus on a particular module and gain some points. Testers should be challenged by giving them the module which has been least tested or is most business critical. As this technique is to have focused testing and gain more points, testers will be more engaged to test the highly critical modules and identify more defects.

This technique will help to address the following challenges:

- No control over what is being tested by the crowd.
- Driving the crowd to test more critical tests instead of less critical tests.
- Having the crowd test untouched areas to ensure complete coverage.

When to use this

This technique should start once we are half way through the testing schedule. We need to review the coverage (by analyzing the web logs) and see the areas which have not yet been covered. Once we have identified the untouched modules, the challenges need to be created in such a way that the testers who take the challenge will cover these untouched modules and identify defects in them.

Quizzes

Quizzing techniques can be used when we want to control the testing and have the crowd testers perform as we want them to. In this technique, testers will be given questions by framing the test cases as questions, such as what the output is when a particular action is performed, and what is present in a particular screen. Multiple choice answers are given with one option having the expected result.

This technique will help to address the following challenges:

- No control over what is being tested by the crowd
- Driving the crowd to test more critical tests instead of less critical tests

When to use this

This technique can be used right from the beginning of the crowd test schedule, or on a needs basis, depending on the coverage.

Bonus scoring

The bonus scoring technique is the most effective one for motivating the crowd and engaging them throughout the test schedule. When designed well, this technique can give better results. In this technique, bonus scores are given to testers when they perform consistently, such as top defect identified for x number of days, participated in x number of days of the test schedule, tested on x number of browsers, bonus score for raising less or no duplicates or invalid defects, etc.

This technique will help to address the following challenges:

- Motivating testers to continue testing without getting distracted
- Consistent involvement of the crowd across the test schedule
- High number of duplicate defects or invalid defects raised

When to use this

This technique should be used from the beginning of the test schedule and the guidelines should be published to the crowd before starting the testing, which can help them understand the scoring mechanism. Bonus scores achieved by the testers should be communicated on a regular basis so that the testers can be motivated.

All the above techniques should be planned based on the project needs and integrated with the leaderboard (by aggregating the scores and showing them in the leaderboard).

The following matrix shows what techniques should be used to address different crowd-testing challenges:

Technique > Challenge v	Leader-board	Challenge of the Day	Quizzing	Bonus Score
Coverage		X	X	
Motivation	X			X
Consistency	X			X
Quality				X

To effectively implement gamification techniques and to have effective communication with the testers, it is recommended to develop an integrated portal which can be used to publish guidelines to testers, the leaderboard, the challenge of the day, and quizzes. This will help testers to get a complete view of their score and rank.

The techniques discussed here are subset of various techniques present in gamification. Though gamification can help obtain better benefits, if not implemented properly it can give a negative result, such as when there is no transparency on how the scoring is done or how defect validity is accessed, and incorrect communication frequency. Selecting the right techniques is the crucial task in implementing gamification.

Conclusion

Gamification is now becoming a trend in the software development process and many projects are implementing these techniques to achieve results. Gamification should be implemented to create a fun environment and engage testers, but should not be looked at as mandatory, nor used to create overheads in projects where this is not required. With proper planning and selection, the right gamification techniques for the right projects, and implementing those techniques at the right time will give fruitful results. ■

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