

An Empirical Study about Testing in a Distributed Software Project

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Abstract: We present the results of an empirical study carried out to identify the context and factors that can affect the productivity of a team of testers in distributed software projects. This information helped us to identify communication delay, knowledge expertise and software quality as the main factors that affected testers productivity.

1. Introduction

This paper discusses some factors that can affect testing team productivity in DSD projects. Our findings are based on data collected in a testers team that worked in a project distributed over twelve different teams in an international company. The information we collected during this study helped us to identify the communication delay and the domain knowledge as some of the main factors that could have affected the testers productivity.

2. Study Context

The studied project had six different sites and was distributed over USA, Europe and India, and also had more than three thousands of requirements and enrolled nearly one hundred and fifty developers. Such sites adopted Scrum-based management practices to help them to coordinate project releases and activities planning.

The studied context represents a largely distributed project and is different from current studies in literature, like the work of [Martin 2007] that also investigated the issues involved in testing software in DSD, but in this case in a team of a small software company. Additionally, this context is similar to the study of [Grechanik 2010] that investigated testing centers working as isolated sites for software testing with no or little interaction with project developers.

3. Reported Problems and Practices

According to the testers their work was heavily affected by their knowledge expertise and the communication dependencies to the remote teams that they had to interact with. It has been reported that these factors affected their project schedule and the quality of their deliverables.

The main issue related to the knowledge expertise described by the testers is that the centralized testing strategy caused a dependency to the domain of all different software modules. Then, when testing software modules were delivered by different development sites the testers had to change the work context many times.

As the testing activities occur after a development team considers their functionality done, in many cases the communication requests made by the testers were answered after a long time with low priority by the developers. This happened because the targeted developer was already allocated with the development of new features. In this context, the testers reported that the manager of a remote team does not allow direct contact to the developers because he thought it could spend or waste their time.

Also related to knowledge expertise and poor documentation, when they had broken features, they faced difficulty to contact the right person to clear their doubts. Even when they found the right person, he could be busy for a remote meeting or even for chatting. In this case, a tester reported that he simply used to postpone the solution of the problem until he gets a vacancy in the agenda of the developer, causing in many tasks a delay time. As a practice to solve the communication difficulties, the testers also reported that had a local developer that they used to have informal conversations to get some tips to help them to guess a way to test it while they waited for a formal answer from the remote developers.

The problems and practices reported in this study are not new, but corroborates with the little research we can find about testing in a DSD context, like the work of [Grechanik 2010] and [Mathrani 2013].

4. Conclusions

This paper presented the results of a study carried out to identify the context and factors that can affect the productivity of a team of testers in a distributed software project. From our results, it is clear that, corroborating with other studies in the context of DSD projects, the productivity of the testers was negatively impacted by knowledge, communication and quality of the products delivered by the developers.

As a limitation of this work data analysis, the project metrics present on managerial spreadsheets, such as story points, could not be compared between different teams because they mean a perception from a group about project size and estimations. Thus, the results discussed in this study are based only in the perception and experience of project members during the software development life cycle.

We also have a conflict between point of views in the project: as project manager and software architect believed that the domain knowledge was not a big issue on this project, the testers reported that it has impacted negatively their productivity. The reason was the absence of required documentation to fully understand the system functionalities. The testers also reported that they needed to understand the whole system domain to be able to successfully execute system integration testing. Poor software cohesion and high coupling between software modules could cause this problem.

5. References

- Grechanik, M.; Jones, J. A.; Orso, A.; Van der Hoek, A. "Bridging gaps between developers and testers in globally-distributed software development". In Proceedings of the FSE/SDP workshop on Future of software engineering research (FoSER '10). ACM, New York, NY, USA, 149-154.
- Martin, D.; Rooksby, J.; Rouncefield, M.; Sommerville, I. "Good' Organisational Reasons for 'Bad' Software Testing: An Ethnographic Study of Testing in a Small Software Company". In Proceedings of the 29th international conference on Software Engineering (ICSE '07). IEEE Computer Society, Washington, DC, USA, 602-611.
- Mathrani, A.; Mathrani, S.; "Test strategies in distributed software development environments". In: Computers in Industry, Volume 64, Issue 1, January 2013, Pages 1-9.