PA2552 - Software Testing

Lean Testing Principles

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February 2, 2026

Notice of AI usage:

Scopus "AI Query Builder" provided by Blekinge Institute of Technology has been used for the purpose of building database queries in search of relevant articles.

1 Introduction

Testing is an essential part in most large-scale projects, whether that would be in industrial manufacturing plants or software development. The practice of ensuring functionality, reliability and safety of crucial mechanisms is a foundational requirement for any kind of development. There are multiple ways of evaluating different types of metrics for a variety of use cases, some wider known types include: stress testing, performance testing and smoke testing [1].

The purpose of this technical report is to collect, analyse and summarise relevant information touching on the subject of lean software testing. More specifically, this report aims to questions: “What are the most important principles of lean” and “where can these principles be applied?”

2 Methodology

The research method employed by this report is to search the common internet for information that may be relevant for the questions outlined in the introduction (section 1). Various data gathering methods have been utilised, namely the Google Search Engine and the Scopus Journal Database have both been used for said gathering. The vetting of the search results was mainly comprised of filtering the contents based on keywords like ”agile testing”, ”lean testing”, ”software development”, ”game development” and ”software engineering”.

3 Results

Lean testing is based on principles that closely align to the commonly known principles and values of agile and lean where the purpose is to maximise efficiency, adapt to change and minimise waste [2]. In addition to this, a core perspective that is a result of the lean way of thinking is the idea that the value of the product along with customer satisfaction should be the central focus [2]

Table 1: Lean Testing Principles

Efficiency / Effectiveness
Minimisation
Test data generation
Execution
Maintenance
Values (-illities)
Purpose
Automation

Table 1: Tabularised form of the reinterpreted lean testing principles (not lean principles) outlined in the PowerPoint slide 9 written by Alégroth et al. [3]

A three-way case-study between waterfall, agile and agile with dynamic QC has been carried out that compared the efficacy of testing within these methodologies [4]. The method Tommy et al. employed in their research yielded a result where the method of doing tests at the end of a production cycle (waterfall) generated a detected defect count of slightly above twenty. In contrast, agile and agile with dynamic QC reached counts of slightly below eighty and around a hundred and ten respectively. In addition to this the test case count is around one hundred for waterfall, one thousand two hundred for agile and nine hundred for agile with dynamic QC [4].

4 Analysis

The results of my data collection show that lean testing adds an additional layer to the development phase. Instead of pushing the testing to the very end causing a large backlog of tests, they are done continuously with the value of the product and the customer in mind. The data also shows that there is a gap in efficacy between waterfall and different implementations of agile and lean testing, showing it is more beneficial to test continously. Dynamic QC as defined in [4] furthers this effect by adding testing as a main focus of a project.

5 Discussion

How could this impact software engineering, and more importantly, how could this affect me and my continued studies and projects? Lean testing is most applicable in larger projects, often showing minor improvements for smaller projects. However as previously stated, lean testing has shown to improve value-creation and customer satisfaction as a result of increase defect detections in addition to being adaptable.

6 Conclusions

References

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[3] E. Alégroth and M. Nass. Pa2552: Software testing. Blekinge Institute of Technology. [Accessed 2026-02-02]. [Online]. Available: https://bth.instructure.com/courses/7004/pages/lecture-3-agile-testing

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