(Self-admitted) Technical debt in mobile application

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ABSTRACT

Technical debt is a metaphor introduced by Cunningham to indicate "not quite right code which we postpone making it right". Examples of technical debt are code smells and bug hazards. Several techniques have been proposed to detect different types of technical debt.
In this document, I present an idea on how to study the diffusion/evolution of technical debt in mobile apps (also Self-Admitted), their impact on change - and fault -proneness of classes as well as how mobile developers deal with them.

CSS CONCEPT

• Software and its engineering → Software evolution; Maintaining software

KEYWORDS

Mining Software Repositories, Technical Debt, Empirical Software Engineering

1. INTRODUCTION

Ward Cunningham coined the technical debt metaphor back in 1993 [1] to explain the unavoidable interests (i.e., maintenance and evolution costs) developers pay while work-ing on not-quite-right code, possibly written in a rush to meet a deadline or to deliver the software to the market in the shortest time possible. In the last years researchers have studied the technical debt phenomenon from different perspectives. Several authors developed techniques and tools aimed at detecting specific types of technical debt, like code smells coding style violations.

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Also, researchers have studied the impact of different types of technical debt on maintainability attributes of software systems and when and why technical debt instances are introduced in software systems.
Recently, Potdar and Shihab [2] pioneered the study of self-admitted technical debt (SATD), referring to technical debt instances intentionally introduced by developers (e.g., temporary patches to fix bugs) and explicitly documented in code comments. They showed how it is possible to detect instances of technical debt by simply mining code comments looking for patterns likely indicating (i.e., self-admitting) the presence of technical debt (e.g., fixme, todo, etc.). [3]
My work focuses on the evaluation of technical debt in mobile apps. The open source projects selected are Urecord, a single-track recorder with built in audio player (supports uncompressed output and the full range of sample rates), and 2048, port of the 2048 game. It's playable without network connection.
The first step of my work consists of extracting technical debt over the change history of the system. To accomplish this objective I use SonarQube. This is an open source platform developed by SonarSource for continuous code quality inspection, to perform automatic reviews with static code analysis, with the aim of detecting bugs, odor code and security vulnerabilities. Once this, I measure change - and fault - proneness of classes, measuring when are technical debt items removed and how.

2. MOTIVATIONS

Many studies on (Self-Admitted) technical debt in traditional system are carried out, but little is known in the context of mobile application. The evaluation of SATD can be very useful also in mobile apps.
This is why this idea was born.

3. AIMS

My main goal is to define a correct way to estimate the technical debt (also SATD) in mobile apps. Once this, I explain how the technical debt is threated and also how can be (if necessary) removed with a complete analysis. In the end, I

explain the differences between the traditional application.

4. REFERENCES

[1] W. Cunningham. The WyCash portfolio management system. OOPS Messenger, 4(2):29–30, 1993.

[2] A. Potdar and E. Shihab. An exploratory study on self-admitted technical debt. In Proceedings of the 2014 IEEE International Conference on Software Maintenance and Evolution, ICSME ’14, pages 91–100, 2014.

[3] 2016 IEEE/ACM 13th Working Conference on Mining Software Repositories. A Large-Scale Empirical Study on Self-Admitted Technical Debt (Gabriele Bavota, Barbara Russo)