Sketches and Diagrams in Practice

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Abstract: Sketches and diagrams play an important role in the daily work of software developers. In our talk, we present results from a study on the use of sketches and diagrams in software engineering practice. We conducted an exploratory study in three companies and an online survey with 394 software practitioners. They worked in different countries and on projects from a wide range of application areas. Most questions were related to the last sketch or diagram that the participants had created. The majority of the sketches and diagrams contained at least some UML elements. However, most of them were informal. More than half of the sketches and diagrams were created on analog media like paper or whiteboards and have been revised after creation. Most of them were used for more than one week and were archived.

1 Introduction

Over the past years, studies have shown the importance of sketches and diagrams in software development. The goal of our research was to investigate the usage of sketches and diagrams in software engineering practice and their relation to the core elements of a software project, the source code artifacts. Furthermore, we wanted to assess how helpful sketches are for understanding the related code. We intended to find out if, how, and why sketches and diagrams are archived and are thereby available for future use. Since software is created with and for a wide range of stakeholders, we were not only interested in sketches and diagrams created by software developers, but by all software practitioners, including testers, software architects, project managers, as well as researchers and consultants. Based on our findings, we point at the need for tool support to better integrate sketches and diagrams into the software development process.

2 Research Design

Our research was carried out in two phases: First, we conducted an exploratory field study in three different software companies to determine a set of dimensions for characterizing sketches and diagrams. In the second phase, we asked practitioners to describe their last sketch based on these dimensions in an online survey with 394 participants.

3 Results

In our talk, we mainly present descriptive statistics and qualitative results. For each dimension, we give a takeaway statement that summarizes the results. A more thorough analysis can be found in our full paper presented at FSE 2014 [BD14].

Creation and Usage

Creating own sketches and diagrams and using such created by others are frequent tasks among software practitioners.

Media

Almost 60% of the sketches are drawn on analog media like paper or whiteboards.

Effort and Revision

Most sketches and diagrams are created in less than one hour and are revised at least once after creation.

Lifespan

Almost half of the sketches and diagrams are used for at least several weeks.

Formality and UML

The majority of sketches and diagrams are informal. If UML is used, it is often mixed with other notations.

Relation to Source Code

About half of the sketches and diagrams are rated as helpful to understand the related source code artifact(s) in the future.

Archiving

Most digital sketches and diagrams, but also more than one third of the analog ones are archived. These visual artifacts are kept, because they document the software, visualize it, and support its understanding.

4 Conclusion

The main contribution of our work is a thorough description of the manifold dimensions of sketches and diagrams in software development. We showed that sketches are related to different source code artifacts and that roughly half of the sketches were rated as either helpful for the respondents or others to understand these artifacts. As documentation is frequently poorly written and out of date, sketches could fill in this gap and serve as a supplement to conventional documentation like source code comments.

References

[BD14] Sebastian Baltes and Stephan Diehl. Sketches and diagrams in practice. In *FSE'14: Proceedings of the 22nd ACM SIGSOFT International Symposium on Foundations of Software Engineering*, pages 530–541. ACM, 2014.