

A Survey on Industrial Software Engineering

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Abstract. In this paper, we present on-going work on data collected by a questionnaire surveying process practices, preferences, and methods in industrial software engineering.

Key words: Agile methods, Software Engineering, Testing, CBSE

1 Introduction

Empirical research is vital for the success of the discipline of software engineering [1]. Well designed surveys are required to collect data for practical validation of hypotheses developed from theory and literature. This paper presents on-going work on data from a web-based questionnaire, surveying current processes, practices, and methods in the software industry. In the questionnaire, we studied three focus areas both separately and in combination:

- The adoption and benefit of different (particularly agile) **process practices**.
- The state of practice concerning **software components** in industry.
- The use, and sufficiency, of different **testing** methods.

The survey was anonymous, but respondents were given the choice to provide company and project name, to allow correlation of responses from the same organization. Respondent invitations were primarily sent to industrial partners in the FLEXI¹ and NESSI² european research projects. In addition, we encouraged the recipients to further spread the invitation.

2 Survey Contents

This survey included a comprehensive collection of questions based on process practices (e.g. [2]), component-based development and testing. The questions were divided into eight groups as shown in Table 1.

¹ www.flexi-itea2.org

² www.nessi-europe.com

Question group	Purpose
G1. Demographic aspects	Collect demographic data about the respondent.
G2. Project and product characteristics	Gather information about characteristics of the software and the project
G3. Software development process practices	Investigate software development process practices — both current and ideal situation.
G4. Software Testing	Collect information about software testing practices within the organization
G5. Component development	Collect information about component characteristics, as well as the development process.
G6. System characteristics	Gather system characteristics.
G7. System development	Collect information regarding component selection and system development.
G8. Discretionary information	Optimal provision of organization and project name, to allow correlation of responses from same organization.

Table 1. Question Groups in the Survey.

3 Ongoing Data Analysis and Future Work

We received 93 responses of which 42 responses were complete³. Since we encouraged recipients to further spread the invitation, we cannot determine the response frequency, nor which organizations are represented in the responses. This type of convenience sampling is suitable to collect empirical data exploring “how” questions, but during any statistical treatment of the data, we must consider the generalisability limitations imposed. Using both quantitative and qualitative analysis, we plan to study:

- Process practices and preferences, and industry demographics correlations.
- Environmental and project characteristics that are important when adopting agile development to different domains and project settings.
- Agility (e.g. embracing change) using black-box non-in-house components.
- System and component verification when reusing components in new contexts.
- Possible agile transitioning limitations by current testing techniques and tools.
- How traditional testers fit into an agile context and what their role would be.

References

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³ Full survey response data is provided in [3]