

Software Tag Standard 1.0 -Background and Definition-

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Abstract

In this paper, we present the definition and its background of Software Tag Standard 1.0, which is a framework to maintain traceability and transparency of software development/maintenance processes. A software tag standard 1.0 is defined as a composite data of 12 kinds of project information and 29 kinds of process information. The overall scheme of software tag has been determined with various requirements from user side and vendor side.

1. Introduction

Quality and security concerns of the software systems in Japan are increasing. Recently, we frequently experienced system's troubles and society confusion, so that the transparency and traceability of software development/maintenance processes have been strongly required.

Also, in these days, the development chains of software projects are becoming longer and longer, i.e., a main contractor works with sub-contractors, and a sub-contractor works with sub-sub-contractors, and so on. In addition, some of those (sub-)*contractors are offshore developers. Such a situation generally reduces visibility of the processes.

In the last position paper for ATGSE 2007, we have proposed a scheme of software tag. A software tag is composite information of software project and software process. Software users (purchasers) receive software tags together with software products, and evaluate the quality of software products and processes of the target projects.

Figure 1 shows an overview of the usage of software tag. The user makes a contract of software system development with a vendor, requiring not only the final products, but also the software tag. The vendor performs software development. During the development, they collect various kinds of empirical data (process and product metrics, quality indicator,

raw products ...). The empirical data is used for the process improvement of the vendor itself. Also some of the empirical data are selected and processed as the software tag for the user. In this paper, we show the software tag standard 1.0 more in detail.

2. Software Tag Standard 1.0

In the software tag standard 1.0, a tag is composed of 41 tag elements, which are categorized into project information and process information, as follows.

Project Information (12 in total)

Basic information (4)

Project name, development organization, project info., user info.

System information (2)

System organization, system size

Development information (3)

Development method, organization, project period

Project structure information (2)

Super project info., sub project info.

Other (1)

Supplemental annotation

Process Information (29 in total)

Requirement (3)

User hearing, size, change

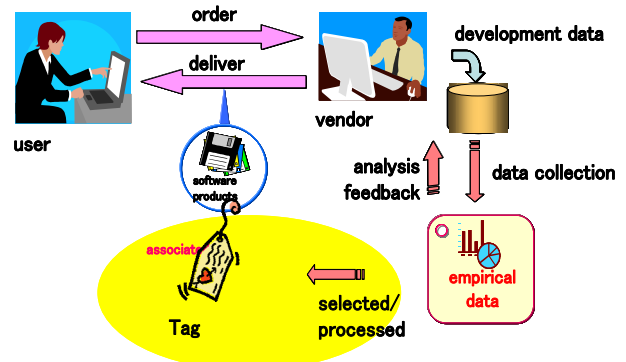


Figure 1 Overview of Software Tag Scheme

- Design (3)
 - Size, change, coverage of requirement
- Coding (3)
 - Size, change, complexity
- Test (4)
 - Size, change, density, progress
- Quality (8)
 - Review status, review density, review efficiency, faults, collective actions for faults, fault density, test efficiency, static checking
- Work load (2)
 - Consumed load, productivity
- Plan and management (4)
 - Process management, meeting, risk element, risk hold time
- Other products (2)
 - Size, change

Each of these elements is described with a few sentences and concrete examples.

We have selected various kinds of information, which are considered important to the users. They should not be too complicated for the user to understand, so we have tried to keep these as simple as possible. Also, the balance of the tag elements is kept in mind. Tag elements which are computable from other tag elements are not included in this standard.

We have referred to various kinds of standards and reports, including SWEBOK, CMMI, ISO/IEC15939, and SEC (Software Engineering Center in Japan) report.

The definition process is based on the discussions with industry collaborators of the vendor side and user side, listed as follows.

Vendors:

Fujitsu Lab, Hitachi, NEC, SHARP, SRA Key-Tech Lab, Toshiba, NTT Data

Users:

Tokyo Stock Exchange, Japan Aerospace Exploration Agency, DENSO

Others:

IPA (Information Technology Promotion Agency, Ministry of Economy, Trade and Industry, Japan), Nara Institute of Science and Technology, Osaka University

3. Usage Model of Software Tag

We can consider various usage models of software tags. The following are typical ones of those.

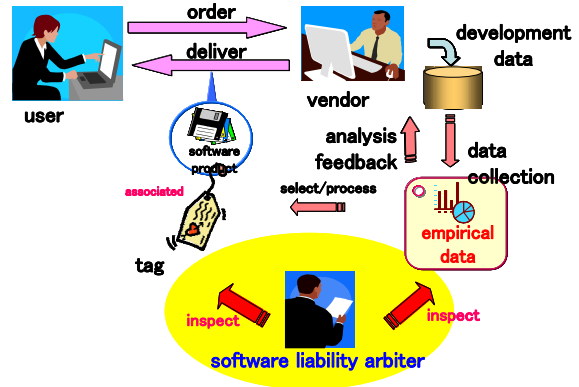


Figure 2 Software Liability Arbitration Case

1. In contract-based development, the user uses the software tag for the quality evaluation of products and processes of the development, as mentioned in Section 2.
2. In the case of a legal dispute between the user and vendor, the software tag is used for evaluation of user and vendor liability, as shown in Figure 2. If there is no consensus between the user and vendor, a software liability arbiter will check the software tag and its supporting empirical data, and determine the liability of the dispute.
3. In the case of choosing software components from a software repository, if the software products in the repository are associated with software tags, the developer is able to evaluate the quality of the products, and to choose appropriate products.

4. Conclusion

We have presented the software tag standard 1.0. Now we are developing tools to support empirical data collection, analysis, and processing for this tag standard. Also, we are promoting this standard, as the basis of fair trade between software users and vendors, including offshore developments.

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