A Proposal for Integration of In-process Project Visualization and Keeping Post-process Traceability: "*MIERUKA*" Method and "Software Tag" Framework

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Abstract

The authors, as part of a software engineering research and investigation organization collaborating with industry, academia and government, had developed an integrated method and tools for software project visualization and popularized them[1][2]. "Keeping Traceability" had added a new object to this activity. In this paper, the authors present an overview of the previous activity, consider the comparison of two objects, and then propose an integrated environment of project measurement.

1. Introduction

The proposed method named "*MIERUKA*"(*) is composed of qualitative, quantitative, and integrated approaches (Fig.1). Formed in three software development phases of upper, middle and lower phases, the method is provided by books, downloadable data and software tools. The authors also executed a verification experiment in a real software project (Fig. 2) [3].

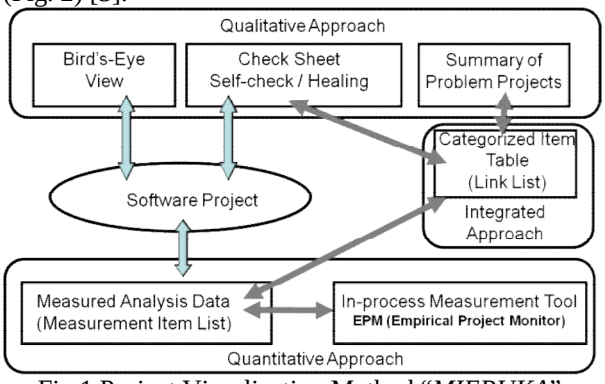

Fig.1 Project Visualization Method "*MIERUKA*"

2. Outline of In-process Project Visualization Method

2.1 Qualitative Approach

There are three steps in this approach.

1) Describe some kinds of "Bird's Eye View" such as "Stake Holder Relationships Chart" to grasp project situation and try to extract the "Dominant Items" of target project.

2) Try to determine the Project Risk using two kinds of project check sheets. One is a questionnaire for self-checking by the project leader which consists of approximately 40 questions and requires approximately 30 minutes answering. The other is a questionnaire for a third observer to use to interview and investigate, such as PMO, which consists of approximately 70 questions and requires over two hours. The results of the two questionnaires will be compared.

3) Avoid project failure by referring to the "Summary of Problem Project".

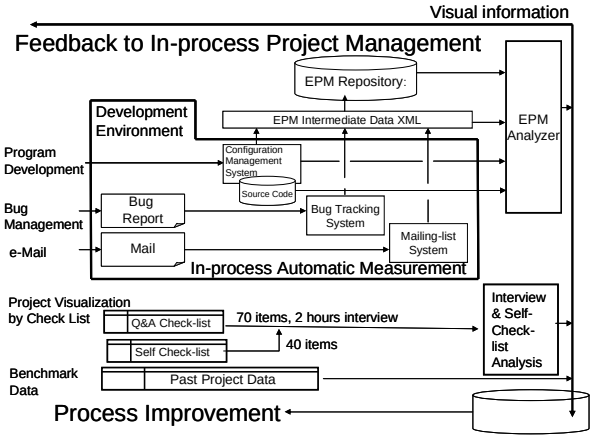

Fig.2 Project Visualization Experiment

2.2 Quantitative Approach

Using the detailed measurement item list for quantitative project management is recommended. This list includes over 70 measurement items for each development phase. The automatic EPM (Empirical Project Monitor) measurement tool provided in the programming and testing phase of the project is especially recommended. Using EPM, for example, source code line transition and bug quantity transition are traceable in real time. In this approach, applying

project benchmark data collection to project prediction and estimation is also recommended.

2.3 Integrated Approach

Some excellent link tables that connect related check sheet items, problem project summary data and measurement items are provided. For example, from unusual check results of the check sheet, related past problem project summary and related measurement items are easy to retrieve. Related check items and past problem project summary are also easy to retrieve from unusual measurement results.

3. In-process Visualization and Traceability

3.1 Key Factor of Two Targets

The main purpose of project visualization through in-process project measurement is smooth project management. The key factors are measurement, analysis and feedback. Collecting process and product data for efficient project management with minimum measurement overhead work is necessary. How to analyze and visualize collected data is also important. How to feed the visualized data back is an essential issue.

While the purpose of keeping traceability is recording an invisible software project, the use is analysis of serious software accidents, incidents, conflicts and long-term software maintenance. For all purposes, recorded data is used in the post-process. The key factors are also measurement, analysis and feedback (information provision), but the contents are quite different from project management. Measurement items must be useful for investigating serious accident or resolving incidents and conflicts. Target persons for information provision are not project managers.

3.2 Proposal of Measurement Environment Integration

In-process project measurement for two different purposes needs individually different functions and structures, but there are similarities in measurement, analysis and feedback. Both measurement targets are the same software project, so the project operation perspective requires an integrated method to keep differences in measurement purposes from creating problems. Fig. 3 shows an idea of integrated environment, reflecting measurement needs for keeping traceability in the previous in-process measurement environment for project management. The information filter also extracts useful data for keeping traceability from the in-process measured data to record. The recoded data is, for example, called as "Software Tag", and it is circulated with target software [4].

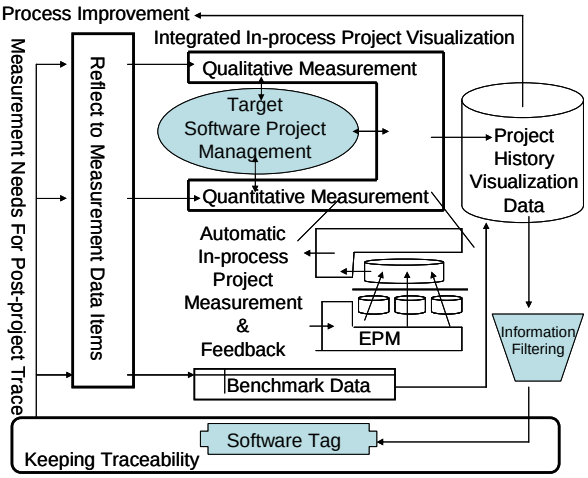

Fig.3 Project Measurement Environment Integration

4. Conclusion

Considering previous research on in-process project measurement environment for smooth project management and a new measurement purpose to keep traceability, the authors proposed integrate the project measurement environment. As bodies of individual research related to this environment exist, the authors wish to realize a new integrated environment and use the existing research in a verification experiment under the collaboration of a large organization.

Acknowledgments

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(*)"*MIERUKA*": Japanese Copy term of "Visualize".