

A Project Replayer for Knowledge Feedback Cycle in Software Development

Keita Goto*

Kimiharu Ohkura*

Noriko Hanakawa**

Hajimu Iida*

*Graduate School of Information Science, NAIST, Japan

**Faculty of Management Information, Hannan Univ., Japan

{keita-g, kimiha-o}@is.naist.jp, hanakawa@hannan-u.ac.jp, iida@itc.naist.jp

1. Aim of the Research

Knowledge extracted from past project experiences should be fed back to the developers. Developers often repeat same mistakes in many projects because they can not make good use of knowledge accumulated in the past projects. We aim to establish the feedback cycle of the knowledge extracted from collected data of past projects.

2. Knowledge Feedback Cycle

2.1 Feature of our Approach

The cycle is supported by three tools; EPM [1], Project Replayer, and Project Simulator. EPM is used to collect various development data. The knowledge obtained from the past projects is fed back in the form of simulation model [2] embedded in the simulator. To establish accurate models, Replayer helps people to carefully observe project history and also helps to find factors and events that are not covered by data collected by EPM

2.2 Basic Scenario

- **Step1:** Various development data (CVS, Bugs, mail) is recorded while developers execute a project.
- **Step2:** Researchers achieve a simulation model based on the analysis of recorded data. Obtained model is embedded in the project simulator.
- **Step3:** Developers make use of project simulations for planning and enacting the subsequent projects.
 - ➔ Go to **Step1** (Development data is collected again and used for future analysis).

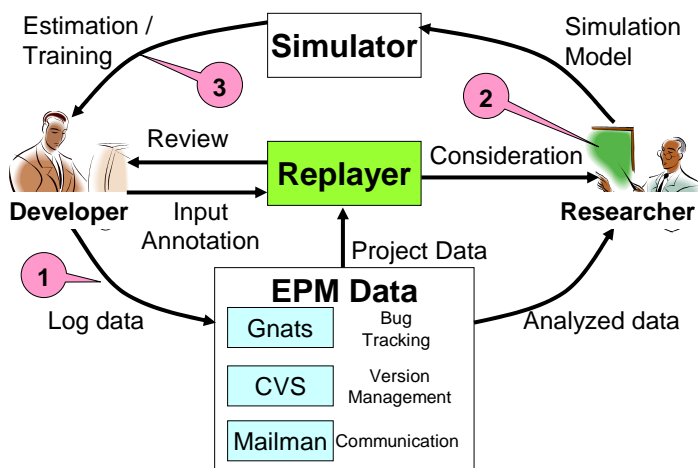


Figure1. Knowledge Feedback Cycle

*What's EPM ?

EPM (Empirical Project Monitor) is a monitor tool developed by EASE project that collects and analyzes the data of various existing development tools such as CVS,GNATS and Mailman.
URL : <http://www.empirical.jp/>

3. The Project Replayer

3.1 Purpose

Project Replayer (Replayer) is a tool to replay project data collected by EPM. Replayer helps understating behavior of past projects through replay. As a result, Replayer accelerates activities in Knowledge Feedback Cycle

Replayer supports both of two roles in the Knowledge Feedback Cycle

- Developer can use Replayer to revisit his/her past project for postmortem evaluation.
- Researcher can use Replayer to deeply understand and analyze dynamic behavior of the past project.

3.2 Features

- **Following information is displayed with animation**
 - Process data: CVS events, Various graph...
 - Product data: Module diagrams containing progress bar associated individuals and events...
 - Annotation added by Replayer user (see next feature)
- **Annotations can be appended by user anytime during replay.**
Recorded annotations are also replayed together with other information. This feature is very useful to insert additional information not recorded by EPM
- **Time bar provides direct access to the interested time point.**

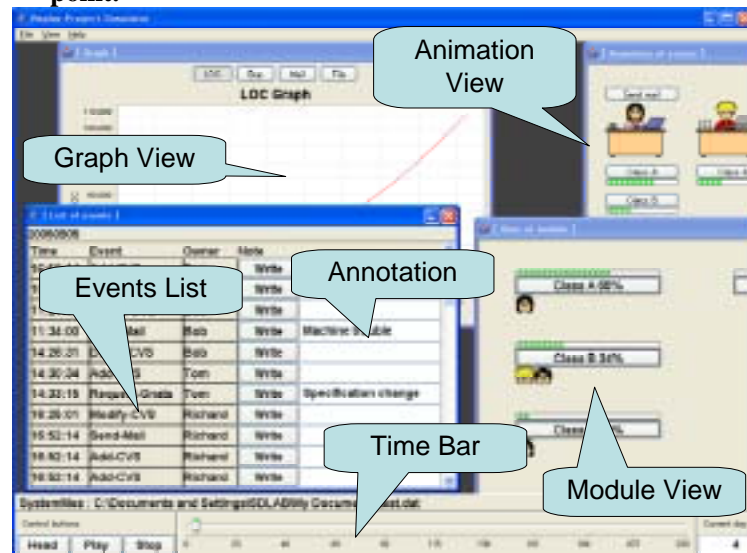


Figure2. Project Replayer Prototype

4. Current Status and Future Plan

The prototype of Project Replayer written in Java is currently under evaluation. The modules of Project Replayer can be re-used as modules of Project Simulator because the module plays same roles of visualization of projects. Developed modules will be used by project simulator that is under development.

Reference

- [1] Masao Ohira, Reishi Yokomori, Makoto Sakai, Ken-ichi Matsumoto, Katsuro Inoue, Michael Barker, Koji Torii: "Empirical Project Monitor: A System for Managing Software Development Projects in Real Time", International Symposium on Empirical Software Engineering 2004
[2]Noriko Hanakawa, Ken-ichi Matsumoto, Koji Torii: "Knowledge-based Software Process Simulation Model" International Journal of The Annals of Software Engineering, Vol.14, pp383~406, October (2002)