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# Cooperative tool maintenance in the context of E-Science

This paper presents the findings of an empirical study in several companies of the German software industry with focus on End User Development and tool maintenance. The research interest aims on collaborative Eclipse tailoring to identify strategies and practises in the labour context of software developers. Via the concept of *Business Ethnography* (Nett and Stevens, submitted, Nett and Stevens ,2004) within the scope of the BMBF project cooperative end user-development (CoEUD) the study researched software development with Eclipse and the adoption of the tool. The implementation of the study comprehended empirical research of the field using methods of empirical social research and the subsequent analysis via qualitative techniques. The identified cognitions of the business ethnography probably gives an understanding of the problems and potential of Eclipse as an component based adaptable tool (Morch et al, 2004).
A first investigation was interested in uncover and document situational labour practices to identify the (latent) potentials and strategies of practice, which arise from the modification of the Eclipse framework. The focus of this study was on small and medium-sized businesses of the German software industry.
In the following we give a general overview of all used cases:

- One scenario is dealing with the further development of a groupware system that supports cooperative work. Within the project an administration toolbox will be developed in order to support the administrators in tailoring for specific needs.
- The second scenario adds the functionality of cooperation to a business game used by teachers in schools. Then they are able to share didactic concepts.
- Thirdly, the study detected some existing necessities for a general maintenance of the frame work Eclipse as a main tool for software

development. Software developers should be supported by adding functionality to Eclipse.

- Finally, the most significant scenario in the scope of E-Science software will be developed that supports scientists at the DESY (Deutsches Elektronen –Synchroton) in controlling their facilities. Main activity of DESY's scientist is in monitoring and controlling the machines used for research in particle physics. The software allows its users to construct their own controlling artefacts by basic graphic components.

The CoEUD use case –scenarios, even the E-Science scenario, covered up with the relevance the maintenance and the adaptation of the used software to the local context. Eclipse with its radical component based architecture opens new opportunities to adapt and enhance the working environment, but it also introduces new complexity managing the maintenance.

Based on our initial study about the use of Eclipse as a tool for software development, we take a closer look into the working practice of software developers. From a methodological point of view, we combine an ethnographical approach with a 'lead user concept' in order to identify problems and strategies in the work practices now, which helps to anticipate emerging work practices in the other scenarios.

The analysis has shown that the motivation for tool modification is often based on a specific project context as well as on the self-reliance of the software developers. Furthermore, the software developers' attitude regarding their autonomous approach for tool modification was expressed in an independent inquiry for additional components in Worldwide Web (eclipse.org), the non-existing of formal instructions and a face-to-face communication as an important factor. Beyond this, the analysis exposed some particular fears concerning tool modification like a decrease of efficiency or a total failure of the tools being used. On no account, a plugin that was self-developed could be found.

The integration of new components or, more specifically, the switch to new releases was motivated by the ambition to be up-to-date. Related to Eclipse, this can be seen as two different significances: In the first place, the maintenance of existing tools was important for the actors (versioning). Secondly, the

implication of new features and modules reflected the appropriation of new technologies and trends in the software development (diversification).

At moment, the first analysis of the research functioned as a groundwork for the improvement of appropriation's support of the Eclipse framework (Dittrich et al., 2005), in particular for the cooperative aspect of tool maintenance. Therefore, more detailed analysis and an anticipation of requirements will be continued. Software will be implemented and constructed against the backdrop of project experience.

## Literature


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