New Opportunities for Empirical Research

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Software engineering community has widely recognized the need for more empirical work due to “advocacy research". New methods and tools have been proposed to industry without providing solid empirical evidence to support the claimed benefits. In addition to this need, we suggest new opportunities for empirical research in software engineering and ICT research in general. We propose the Experimental and Explorative Research (EER) strategy to address (1) tool development in software engineering research, and more importantly, (2) application and service development in other ICT areas like research in mobile applications and services. These kinds of projects provide a much more realistic environment for experimentation than traditional student projects, yet they can be controlled much more easily than pure industry projects.

The actual software development work in research projects (not only the use of the tool) is an excellent candidate for empirical research. Tool development process in research projects can be treated as an experiment or quasi-experiment. These projects may include large amounts of professional effort for developing prototype tools and services. Very often the conclusions overlook the development process and are purely related to the end result. They may be similar to an industrial feasibility study and results are product oriented. They ignore development issues, validity concerns are not dealt with, and conclusions mostly lack empirical data from the development process. Influencing factors for success (or failure) of prototype development are not addressed. Generalizability and human factors in the development phase are mostly ignored.

Experimental and Explorative Research (EER) research strategy combines experimental software engineering with exploratory research of new technologies. EER is based on our several years experience of using and developing the approach in research of future mobile applications. In large international projects (e.g. EU projects) explorative application development includes often both industrial software developers and experienced researchers. This kind of an experimental research environment alleviates the subject problems found in student experiments. Furthermore, it does not have the same difficulties found in experimental design and control of industrial projects that are constrained by strict commercial conditions.

EER strategy provides benefits for both worlds: (1) experimental software engineering research benefits from almost industry level projects that can be used as experimentation environments, and (2) future mobile and telecom application research benefits from better control and understanding of the characteristics of the applications and their development methods and processes.

V. Basili et al. (Eds.): Empirical Software Engineering Issues, LNCS 4336, p. 22, 2007.