A Methodical Assessment in Software Engineering

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Abstract

A number of principal studies have been conducted in the field of software engineering during the last years, accompanied by an increasing improvement in methodology. However, in most cases software is built with technologies for which developers have inadequate facts to confirm their appropriateness, limits, qualities, costs, and natural risks. It is difficult to be sure that changing software practices will necessarily be a change for the better. It is possible that research syntheses can provide the mechanisms needed to assist practitioners to adopt appropriate technologies and to avoid inappropriate technologies. Thus, the growth of research syntheses in this field is still an area of investigation that remains to be explored and that could well bring many benefits. In this paper, we are focusing on the origin of methodical assessment and different phases of methodical assessment of software engineering.

Keywords: Methodical, Unmethodical, Three Step Approach,

I. Introduction

As we know that learning and proper understanding of software engineering is essential for Information Technology's professional. Also, as we know that the term methodical assessment (MA) is a process of research used to refer to a specific tactic of research, developed in order to gather and evaluate the available evidence pertaining to a focused topic. In the remaining of this paper, there are four more sections. In Section 2, we provide a brief idea about the origin of methodical assessment. Also, the methodical assessment of software engineering is discussed in section 3. Furthermore, we have conclusion and references in section 4 and section 5.

II. The Origins of Methodical Assessment

Early works to integrate results can be traced back from the beginning of the 20th century [Cooper and Hedges, 1994]. Pearson, in 1904, calculates the average of results of the correlation between inoculation for typhoid fever and mortality in order to better estimate this type of effect and to compare it with that of the inoculation for other kinds of disease.

In the 1930s, methods for combining estimates are developed in other fields of research, such as the physical sciences [Birge, 1932] and in the statistical sciences [Tippett, 1931], [Fisher, 1932], [Cochran, 1937], [Yates and Cochran, 1938], and later applied to other fields, such as agriculture, with few methodological unfolding in the following decades. The use of synthesis techniques gains momentum in the 1970s, when new methodological proposals for integrating research results are developed as well as several applications are mainly developed in the social sciences.

III. Methodical Assessment of Software Engineering

There are several primary studies have been conducted in the field of software engineering In most cases software is built with technologies for which developers have insufficient evidence to confirm their fittingness. In this context, there are few initiatives that question how Software Engineering would benefit from adopting the evidence approach. Kitchenham et al [2004] discuss the possibility of evidence-based Software Engineering by using an analogy with medical practice. Nevertheless in order to obtain evidence, it is necessary to perform methodical assessments. So, Kitchenham [2004] evolutes the idea of Evidence-Based Software Engineering and proposes a guideline for methodical assessments that is appropriate for software engineering researchers. The guideline has been adapted to reflect the specific problems of software engineering research and covers three phases of a methodical assessment: planning the assessment, conducting the assessment and reporting the assessment. However, it is described at a relatively high level. It does not consider the impact of question type on the assessment procedures, nor does it specify in detail the mechanisms that are needed to undertake meta-analysis.

Like all knowledge areas that have previously developed this research methodology, developing this investigation approach in the software engineering field implies in adapting the conceptual and methodological dimensions of research synthesis to the domain, taking into account its specificities as a scientific knowledge area [Pressman, 2002]. Differently to the medical area, Software Engineering has some specificity that would make it difficult for the research synthesis to obtain evidence. One major difference between medicine and software engineering is that most software engineering methods and techniques must be performed by skilled software practitioners that are aware of the methods and techniques that are being applied. In contrast, although medical practitioners are skilled individuals, the treatments they prescribe (e.g. medicines and other therapeutic remedies) do not necessarily require awareness of their effective presence in order to be skillfully administered by the professional or received by the patient. The reason why skill presents a problem in the software engineering field is due to the fact that it prevents adequate blinding of practitioners during the study. In medical experiments (particularly drug-based experiments), the gold standard experiment is a double-blind randomized controlled trial (RCT). In a double-blind experimental trial neither the doctor nor the patient knows which treatment the patient is being administered. The reason why double-blinded trials are required is to prevent patient and doctors expectations biasing the results. Such experimental protocols are impossible to conduct in software engineering experiments, which rely on a subject performing a human-intensive task.

IV. Conclusions

Methodical assessment is a scientific methodology that can be used to integrate empirical research on software engineering. Though its importance, conducting systematic reviews is not a simple task. It evolves performing complex actives and understanding specific concepts and terms that may be unknown to researches.

The difficulties found during the methodical assessment execution pointed the need to investing research efforts in developing methodical assessment planning and execution methodologies. Therefore, we defined a methodical assessment conduction process. This process aims at guiding researches when performing systematic reviews.

V. References

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