Work Plan for a Rapid Review about Criteria for Selecting SE Tools

About this document

This document describes the work plan for conducting a Rapid Review in collaboration with Ericsson. This template is inspired by the paper "Fostering industry-academia communication through rapid reviews. A proposal for software engineering".

Team:

LTH

Ericsson

> Elizabeth Bjarnason – PM and researcher
> Per Runeson – researcher
> Emelie Engström, Validate RR method
> Sergio Rico, Validate RR method

> Patrik Åberg - Expert and Ericsson facilitator

Background

The R&D organization at Ericsson uses a wide range of software tools for developing embedded software, including text editors and compilers, systems for managing configuration, testing etc. These tools are often selected in an ad hoc fashion without full insight into the impact on the overall product development, e.g. regarding product quality, individual and project-wide productivity. Rather as teams identify a need for a new or improved tool for their specific area of responsibility they select a tool based on a best-effort assessment at the local level. These tools are often later spread within the organization in an organic fashion. Sometimes with negative impact at the project or product level.

In this collaborative study, we want to investigate what criteria that are relevant to consider when selecting software engineering tools by reviewing current state-of-the art within research. We expect the outcome to be a list of criteria and guidelines for assessing and selecting SE tools from a holistic perspective, including both the individual, team, project and organizational level.

One of the sections within Ericsson's development organization will act as our main focal point and object of study. This team is responsible for developing internal software engineering tools.

Objective

The main objective of this review is to assess research evidence about criteria for selecting SE tools.

> **RQ1**: What criteria are relevant for Ericsson to consider when selecting a SE tool?
> **RQ2**: How can cost and benefit be considered and balanced when selecting SE tool solutions?
> **RQ3**: How is the selection of an SE tool affected w.r.t. the aim to improve a) overall productivity and b) product quality?

Plan

The

Time frame	Step	Activities for Researchers	Activities for Practitioners
June-20	Prepare review: **Scope**	Define scope including preliminary research questions	Agree on scope and discuss research questions
	Define **research questions**	Confirm research questions	
	Develop **work plan**	Define work plan and keywords for searching.	Validate work plan, in particular times frames
Aug-20	Identify and select relevant research	Search for articles and apply selection criteria.	Validate relevance of selection by reading sample articles.
Aug-20-Sept-20	Extract and synthesize data, Define criteria & Plan presentation[1]	Construct **list of criteria** based on data.	Provide info regarding industrial relevance including **list of criteria used within company.**
		Meetings to discuss criteria and to plan presentation activities.	
Oct-20	Describe criteria and evaluate the review	Prepare presentation (article, seminar etc).	
		Evaluate limitations and deviations, e.g. compared to initial work plan.	

Search and selection

Search string: *ALL (select*) AND TITLE (tool*) AND TITLE-ABS-KEY ("software engineering tool") OR TITLE-ABS-KEY ("CASE tool")*

Search responsible: *EB*

Electronic databases

The following databases will be consulted for all years up until the current data (2020): Scopus

Additional search

As the papers are analysed and coded, relevant references will be noted to allow for focused snowballing.

Approach to grey literature

Only peer-reviewed material is included in the literature scan.

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[1] Iterate this step with gradually larger set of articles, and improved list of criteria both w.r.t. completeness and relevance.

Selection responsible

The selection will be conducted by EB and the include/exclude decision made for each step will be noted to allow for later validation.

Screen actions

The screening will be performed in steps based on gradually extended article information, namely

1. *Title*
2. *Abstract*
3. *Full paper:* a) introduction & abstract, then b) screening performed during synthesis / coding

Include
- Articles that present or evaluate criteria for assessment and/or selection of tools for industrial software engineering work

For screen steps 1-2, also include:
- Articles that discuss selection, assessment or evaluation of SE tools (including CASE tool)
- Articles on empirical investigations of experience of introducing or using a tool.
- articles that are borderline or when unsure of relevance of article content, until later screening steps.

Exclude
- Articles that describe the design and/or implementation of specific tools mainly from a feature perspective, including investigations into detailing functionality for specific domains or applications.
- Articles that solely evaluate the impact of tools on productivity etc without investigating explanatory factors
- Articles on non-software tools and/or tools in an non-industrial software engineering context
- publications that are not scientific articles, e.g. presentation slides
- articles that have later been extended (include the extended version)

Studies in languages other than English

Excluded

Tools for search and selection

MS Excel will be used to log all searches and all selections from step 2 and onwards.

Data collection

Data extraction responsible

The data will be extracted by EB.

Tools to analyze data

nVivo will be used for the analysis of the selected articles.

Data to be extracted

Information regarding the following will be coded to allow for later extraction:

- context and type of study, e.g. tool evaluation, literature review
- selection criteria
- process for defining criteria
- relevant reference for further analysis (snowballing)

Data synthesis

The data will be synthesized by EB, and then presented to and discussed with PÅ. The research questions will be answered through joint analysis of the findings and comparing these to industrial practice.

Presentation

The results from the review will be used to produce a design artefact (list of criteria for tool selection) that will be presented at Ericsson at a focus group and within academia through a joint scientific article.