Appendix A: Questionnaire Introduction

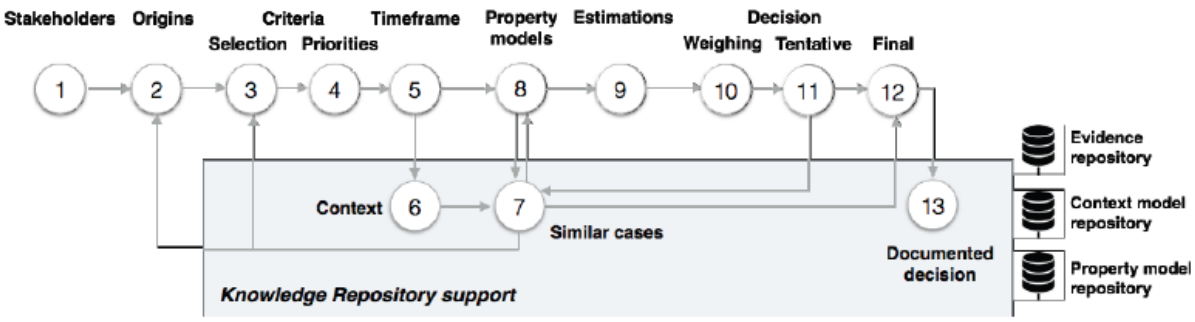
Decision-making in Practice

The purpose of this survey is to compare two decision-making processes based on their perceived usability and correctness for decision-making in industrial practice. Decision-making that can regard adoption/purchase/development of new technical assets, libraries, tools, etc. The goal of the study is to propose a decision-making support framework that can help industrial practitioners to make quicker, better, more structured, objective decisions when introducing new assets/solutions in a system or development environment.

The questionnaire first presents the two processes, followed by a series of questions about them. All responses will be dealt with anonymously but we request that you tell us what company you are from as this survey is sent to multiple companies. If you wish to get the results of the study, please also enter your e-mail at the end of the questionnaire.

If you have any questions or concerns about the survey please contact me: Emil.Alegroth@BTH.se.
Thank you in advance,

Dr. Emil Alégroth
Blekinge Institute of Technology | Chalmers University of Technology | Software Center



Decision process 1

Figure 1 presents the first decision-making process, including the steps of the process (described below) and the knowledge repositories (Databases) associated with the process. These repositories are optional but preferred and include:

1. An evidence repository: Information stored from previous decisions to make decision-making easier or at least avoid previous mistakes.

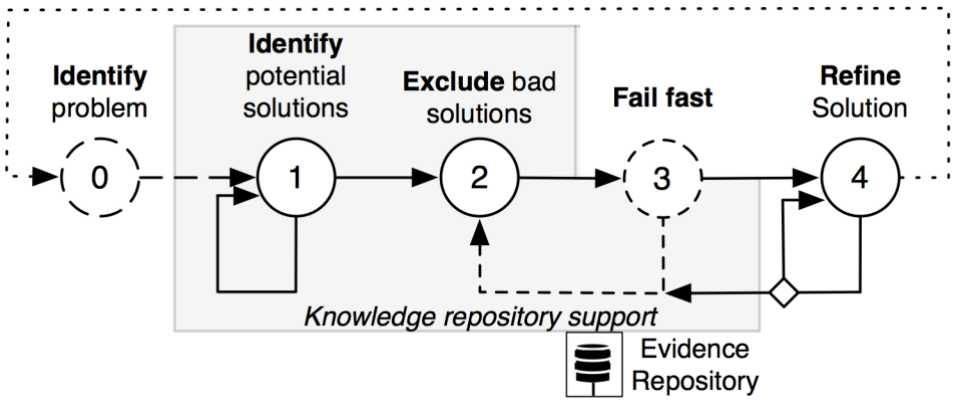
2. A context model repository: Storage of previously created context models, where a context model should capture the situation before a decision was taken with respect to (1) the product before the decision, (2) people involved in the decision, (3) processes and (4) practices, techniques and tools, (5) the organization, (6) and the market.

3. A property model repository: Storage of property models used for previous decision making where a property model consists of (1) A property defined by a set of attributes and (2) a method to evaluate to what amount an asset's has the property.

These repositories are used in a process defined by the following, all optional, steps:
Step 1: Identify stakeholders to be involved in the decision
Step 2: Evaluate the suitability of possible assets/solutions
Step 3: Decide criteria based on goals for the development/environment/process/business/etc. that must be fulfilled
Step 4: Decide on priorities for criteria
Step 5: Decide on time aspects, short- and long-term goals/benefits/drawbacks/etc.

Step 6: Describe the context (Context model)
Step 7: Look at similar cases in the knowledge repositories
Step 8: Decide on property models (Property defined by attributes, measured with a specific method)
Step 9: Make estimations using the property models (Methods of the models for each property)
Step 10: Weigh the results of chosen, estimated, properties
Step 11: Make a tentative decision of what asset/solution to choose
Step 12: Make a final decision
Step 13: Store the case in the knowledge repository (Split in the three sub-repositories)

This process has been defined for decision-making about asset-origin selection where an asset-origin concerns if an asset is developed in-house, outsourced, open-source or customer of the shelf (COTS). However, the process is assumed to be suitable for direct asset, and other solution, selection as well.



Decision process 2

Figure 2 presents the second decision-making process, including the steps of the process (described below) and the knowledge repository (Database) associated with the process. This repository is optional and defined as:

Knowledge repository: Information from previous decisions, documented to a level of the decision-maker's choice. Note that expert opinion/knowledge can be considered a repository in this model. The repository is, if available, used in the process defined by the following steps:

Step 0: Identify the problem for which a decision is required. Consider what the core problem actually is, what the root-cause of the problem is, which stakeholders that are affected, what the observable impact of the problem is and what contextual factors that affect the problem and thereby restrain the potential solution(s).

Step 1: Identify as many solutions to the problem as possible. Focus on finding solutions with high similarity to other/previous solutions in the organization, solutions with low adoption/usage/maintenance costs, and solutions with high interfaceability or high ease of integration.

Step 2: Exclude as many assets/solutions as possible that do not fulfill a requested property to a satisfactory level, continue with the next property until only one or a few solutions remain.

Step 3: Adopt the best "good enough" solution as quickly as possible to allow it to "fail fast" if it fails. Thus allowing a new possible solution to quickly be adopted in a flexible manner.

Step 4: Finally the "good enough" solution needs to be refined/adapted to the environment. This step is required since it may turn out during refinement that the current solution was, in fact, unsuitable and/or that other changes are required that need more decisions to be taken. Changes that may break some previously defined solution exclusion criteria, e.g. maximum acceptable cost.

Consequently, this process has been designed to be as lean and flexible as possible, following practices defined for agile software development such as fail fast, iterative adoption and iterative improvement.