**Validation of knowledge**

***Definition:***

Checking that knowledge is fit for purpose, and free from fundamental errors*.*

**Key words:**

Knowledge validation, knowledge verification, knowledge evaluation, validation criteria, knowledge validation principles

**Introduction:**

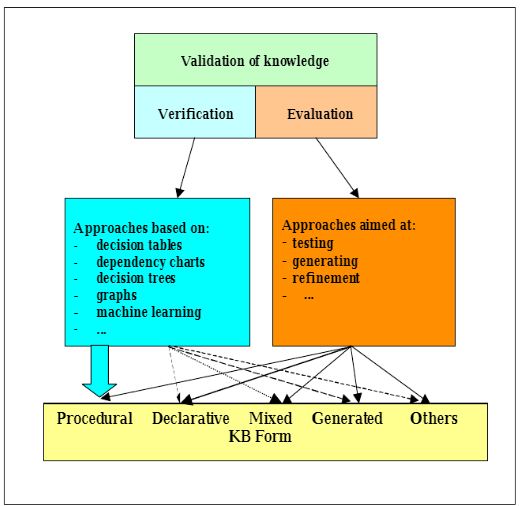
Looking at the most popular techniques of KV: graph- tree- or table-oriented, we try to define certain principles useful in the validation procedures referring to two levels: **general** and **detailed.** Specific dependence of knowledge verification criteria in contrast to independence of knowledge evaluation criteria are examples of the general principles. Naturally, each of the individual techniques can be used for specific, more precisely defined conditions however more universal principles can be formalized as above.

**KNOWLEDGE VALIDATION APPROACHES**

**OVERVIEW**

Among the software community, validation is interpreted as “building the right product”, verification as “building the product right”. After we assume the validation process can be considered as some determined composition of two kinds of tasks: Activities that intend to reach the structural correctness of the KB

(verification), Activities that intend to demonstrate the KB ability to reach correct conclusions (evaluation). On the other hand, validation refers to different components of a knowledge-based system. We can validate a knowledge base, inference engine, and user interface etc. We focus on validation of knowledge, especially on validation of a knowledge base. In the validation process, two sorts of activities mentioned – verification and evaluation – are complementary and therefore different methods to reach their goals are applied.

******

**GENERAL PRINCIPLES OF KNOWLEDGE VALIDATION**

To state specific "rules" for knowledge validation, conforming to the established assumptions, we will present a formal description of each of them, together with some comments. The list of these rules is presented below.

**General principles for knowledge validation**

1. Conformity of knowledge validation procedures and criteria
2. Specific dependence of knowledge verification criteria
3. Independence of knowledge evaluation criteria
4. Unity of practical approaches to knowledge validation
5. Complementarily of practical approaches for knowledge validation.

1. According to the first rule: "conformity of knowledge validation procedures and criteria" particular criteria are assigned to the specific procedure. To be more precise: verification is identified with completeness and consistency, while the others (adequacy, reliability and economics) pertain to the evaluation procedure.

2. The second principle: "specific dependence of knowledge verification criteria" expresses potential interactions between two verification criteria: completeness and consistency. If we start from checking completeness(which can be effected by a rule set modification) and then check knowledge-base consistency, the final results of the verification may be different. Thus, we discover an impact of applied approaches on achieved knowledge base properties.

3. An output of the third principle - "independence of knowledge evaluation

criteria" states: knowledge adequacy, reliability and economics can be treated as unconnected properties. As a consequence, the mentioned criteria and evaluation of knowledge can be tested and measured in any order.

4. The fourth rule - "unity of practical approaches to knowledge validation" determines the general assumption of the specific validation method. Each method has a strictly defined procedure, with stated input and output streams, which all constitute a unity.

5. According to the fifth general principle: "complementarily of practical approaches for knowledge validation" almost all methods are developed for a very specific purpose. Complete verification and evaluation require the application of more than one method. There are very few total solutions in this respect.

**CONCLUSIONS**

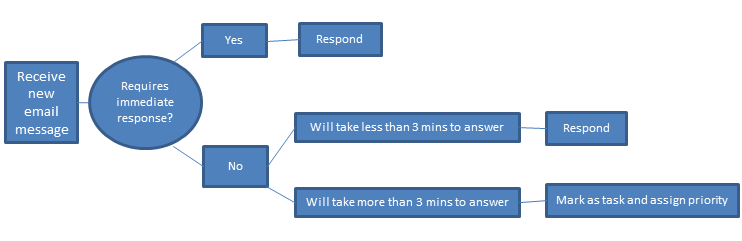
We argued the need for the development of some principles aimed at performing the knowledge validation process. Analyzing the chosen interrelationships amongst the components, we have formulated principles with a more general range. They describe real and potential references among validation procedures and a set of criteria, stressing some usability aspects. The second group of principles is strictly oriented towards a particular form of knowledge representation. A set of general and specific regulations is necessary to perform validation effectively.

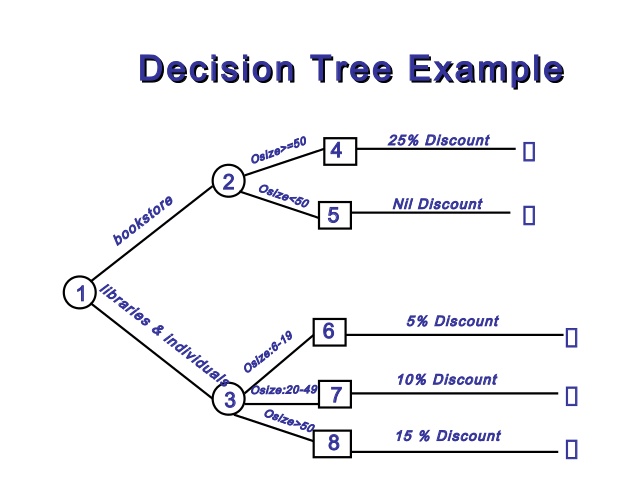
**DECISION TREE**

A decision tree is a graph that uses a branching method to illustrate every possible outcome of a decision.

Decision trees can be drawn by hand or created with a graphics program or specialized software. Informally, decision trees are useful for focusing discussion when a group must make a decision. Programmatically, they can be used to assign monetary/time or other values to possible outcomes so that decisions can be automated. Decision tree software is used in data mining to simplify complex strategic challenges and evaluate the cost-effectiveness of research and business decisions. Variables in a decision tree are usually represented by circles.

Here’s a simple example: An email management decision tree might begin with a box labeled “Receive new message.” From that, one branch leading off might lead to “Requires immediate response.” From there, a “Yes” box leads to a single decision: “Respond.” A “No” box leads to “Will take less than three minutes to answer” or “Will take more than three minutes to answer.” From the first box, a box leads to “Respond” and from the second box, a branch leads to “Mark as task and assign priority.” The branches might converge after that to “Email responded to? File or delete message.”





ï
19
 