

## Development of a web platform of knowledge exchange for optimal selection of building materials based on ecological criteria

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**1. Introduction**  
In technical problems where decisions must simultaneously satisfy several conflicting objectives, methods are based on benefit-cost analysis or multicriteria decision analysis helpful to identify the "optimal" decision. Usually big technical decisions are made by politics and influence the environment, but specialists, constructors and the society must have the ability to overview and inspect these decisions. This platform is conceived to help people, organizations and governments develop their constructions (society) towards commons-based approaches through co-creating an open knowledge commons. Classical decision theory states that rational decisions are those that maximize some utility function. One way to construct such a function is to use benefit-cost analysis that is translating all criteria into monetary values. A common method of doing so is to make surveys and use people's willingness to pay (WTP). Given the problems of benefit-cost analysis, some prefer multi-criteria decision analysis (MCDA), in which the utility function is usually approximated by the weighted sum of the scores of the criteria. Of course, the scoring and the selection of weights are arbitrary to a certain extent. Proponents claim that such decisions cannot be objective in order that this arbitrariness reflects the subjective preferences of the decision, and that MCDA is valuable because it makes the subjectivity explicit rather than present the decision as a black box.

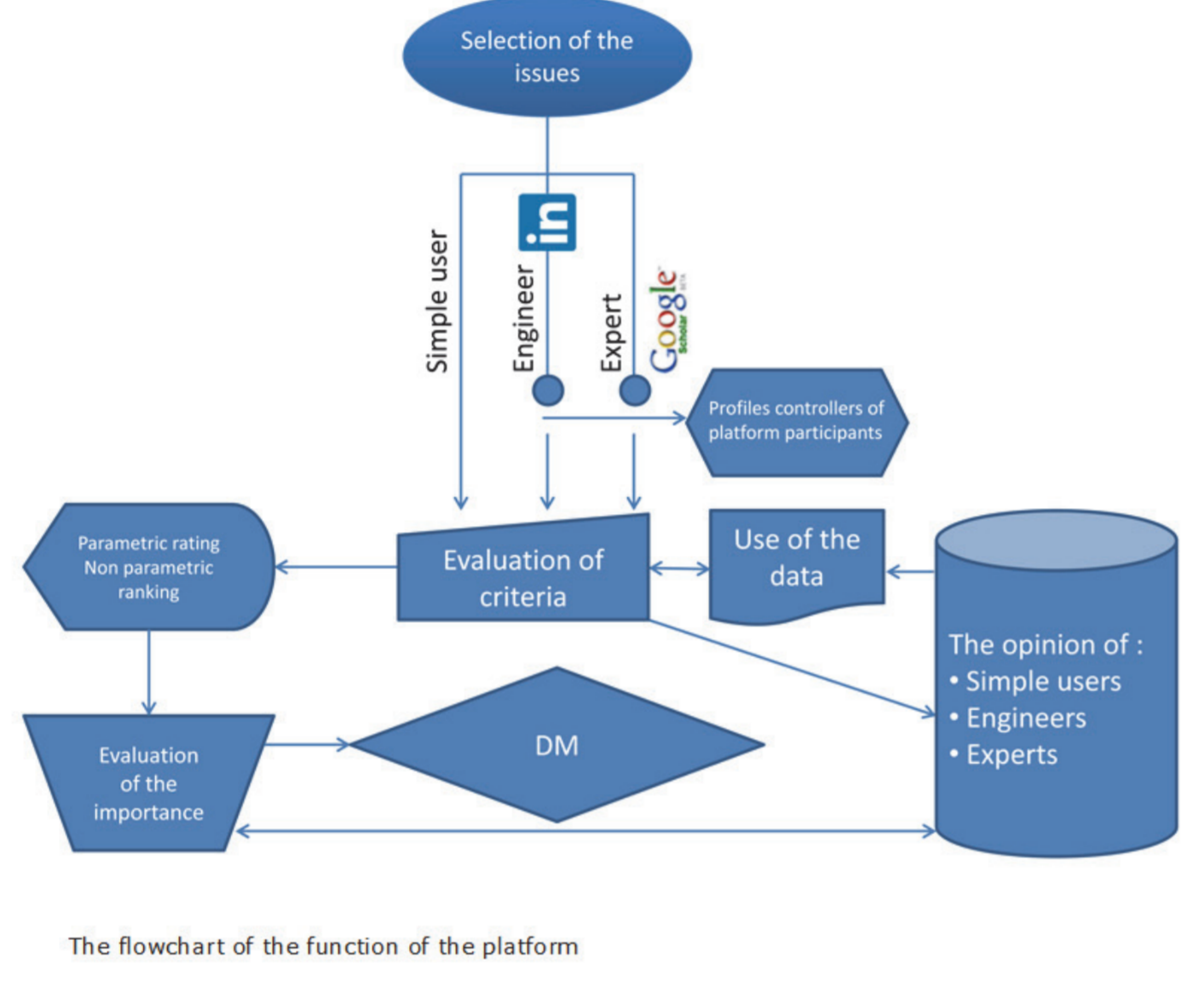
Extensive analysis of the problem from several viewpoints and a presentation of the reasoning are necessary to achieve an informed decision based on understanding and knowledge. In order to optimize a technical decision for society, engineers, experts and politics, architecture of a web platform based in "common" knowledge, optimizes the decision making analysis by evaluating building materials based on ecological criteria. The presentation of this process is presented by the formulation of a multicriterion tableau.

**2. Existing evaluation methods of the ecological criteria and the prototype of this platform**  
Selection of building materials based on ecological criteria is a multicriterion problem with a lot of undetermined constant. Many of criteria can be evaluated by numbers, but other criteria could not be evaluated by numbers.

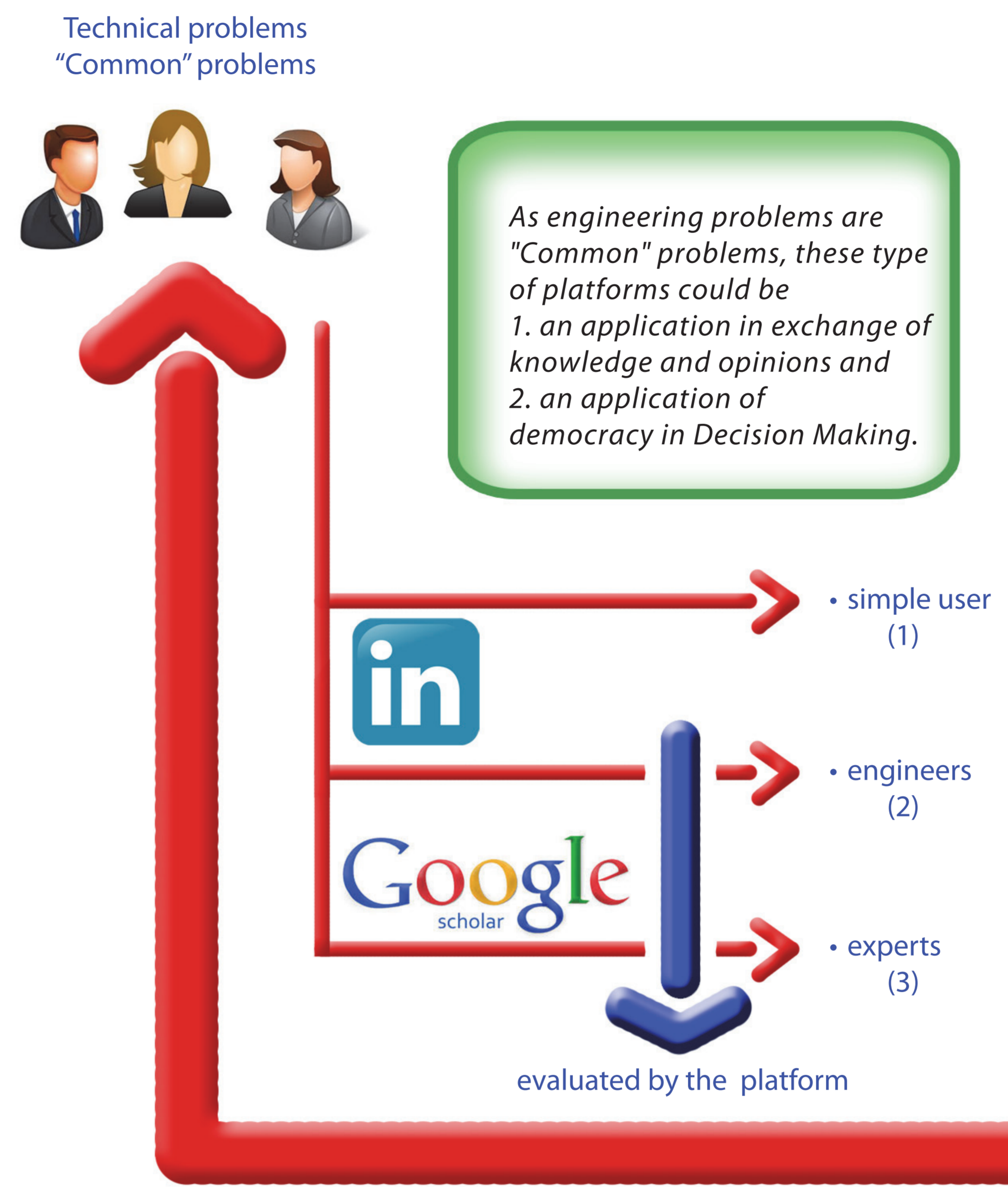
There are many attempts approaching this issue, but in order to be useful, many of the criteria are inactivated some of the criteria which cannot be numbered are evaluated by the platform controller and finally seems that the platforms give to the users results based on the evaluation of the platform maker. The proposed platform interacts with the user for the evaluation of non numerical values and allows the user to validate all the criteria of the given problem. As the evaluation of ecological criteria is a technical problem which involves all the society, the design of this platform must be a collaborative website, like Wiki functioned. This platform can facilitate the creation of decision networks without directing them.

**3. Commons**  
The platform of this research is a commons-oriented peer production and its viability is based in real-world applications. Our focus on the productive potential of construction communities around the world inspires us to nurture a decision maker's network with open collectives and more established criteria to extend environmental friendly policy recommendations to those in the position to effect change. This platform serves to distribute power away from any central political figure and to allow individuals to develop their roles and contributions according to their society needs. Supplementary we could have a Wiki application which could be in use by a decision-maker (DM) to solve a multi-criteria problem.

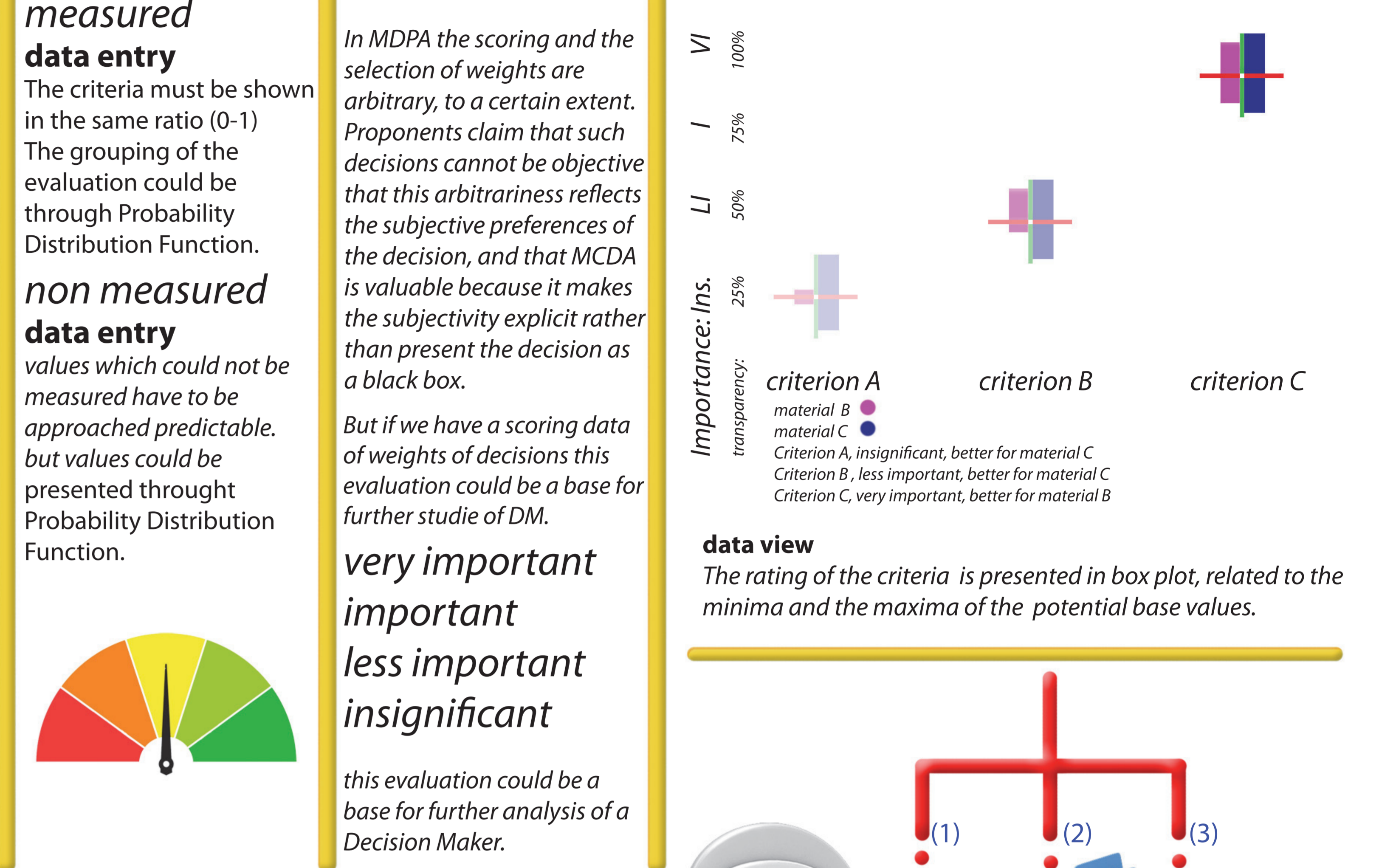
**4. Multicriterion tableau**  
Additionally the users of this platform would be able to add criteria and evaluate them in tables with characteristic symbols and react with the data stored in the platform (opinion of the others). Platform will be able to collect the data of each user, react with the user and formulate a holistic summary of the results in symbols and colors. We could say that that this is a classic example of multi-criteria decision analysis (MCDA). Thus the problem must be summarized in a multicriterion tableau, which will describe criteria values.



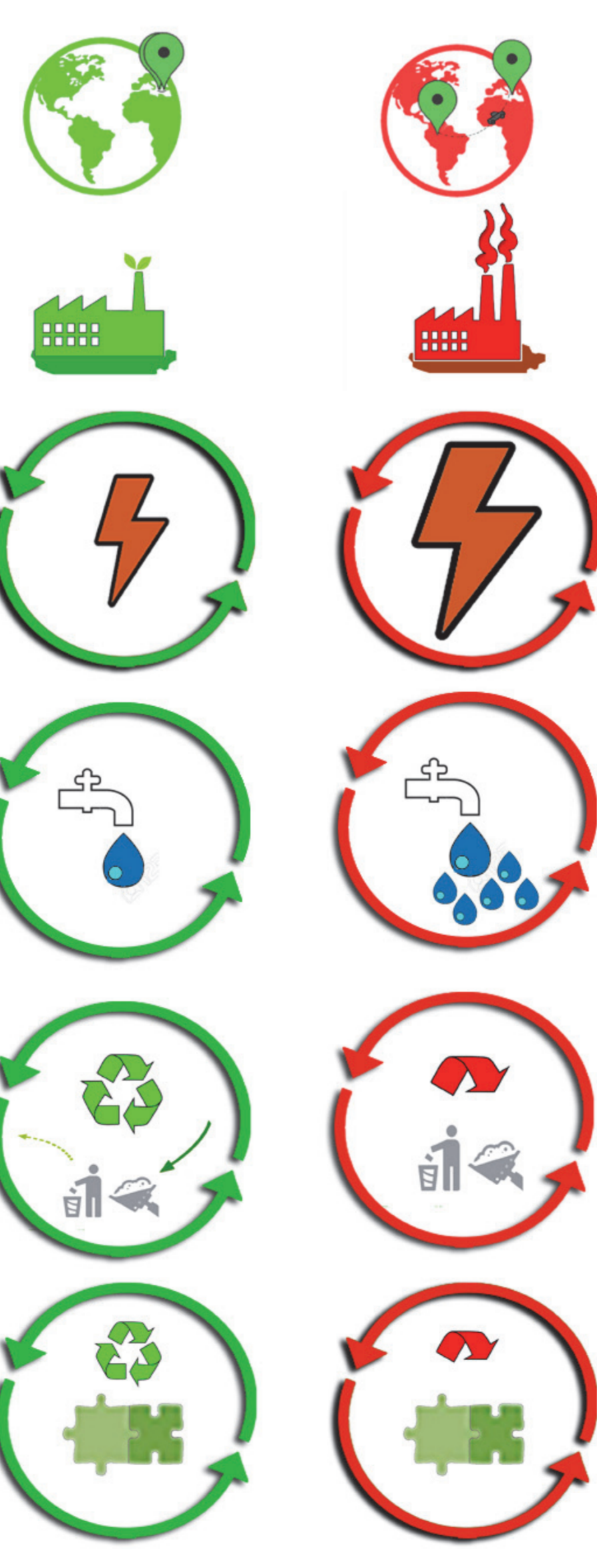
The interface of the results



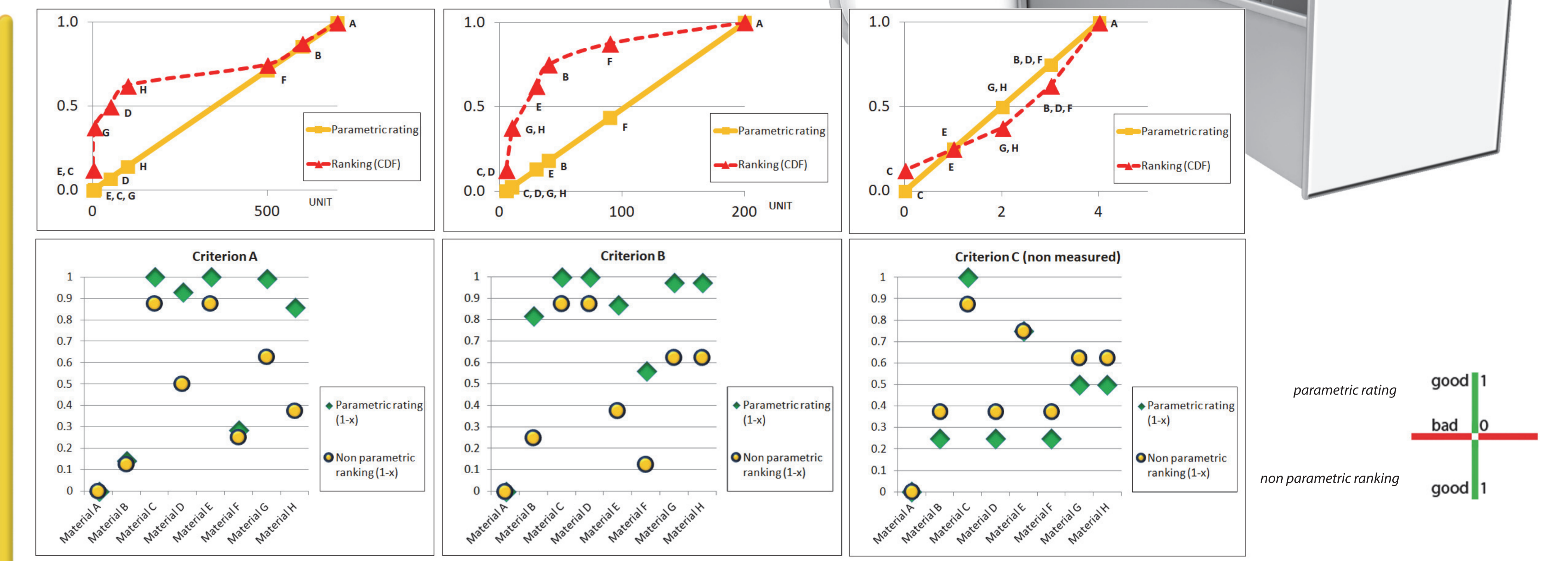
### M U L T I C R I T E R I O N T A B L E A U



#### Example of criteria



#### Example of the calculations



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