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THE LACK OF TRANSPARENCY IN PUBLIC DECISION PROCESSES

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Abstract

We discuss the lack of transparency and use of elaborated decision methods in public decision processes. The decision regarding new roads in the greater Stockholm area has been used as a significant example.

Keywords: public decision process, transparency, e-participation, decision analysis.

1. Introduction

It is remarkable that costly and controversial decisions concerning public works projects are very often underpinned by poor planning and analysis [Flyvbjerg, 2006]. One enlightening example is the Swedish road construction project in the greater Stockholm area called Nordsydliga Förbindelser[1], which was decided on late last year. Our interest in the project started from a decision methodological perspective, but we rapidly discovered indications of serious technical problems.

The background to the project is an estimate for the Stockholm car traffic to increase by approximately 40 percent during the next 15 years. The Swedish Road

[1] In English: North-South connections.

Administration investigated various options for connecting the northern and southern parts of Stockholm. Various information relating to this can be found at the website www.vv.se, [SRA2] and a comprehensive report is to be found at[SRA, 2005].

1.1. Criticism of the Employed Basis for the Decision

In the report from the Swedish Road Administration, two alternatives for the construction of the road project are described: *Förbifart Stockholm* and *Diagonal Ulvsunda*, as well as an alternative focusing on public transportation and road fees called *Kombinationsalternativet*. In addition, a reference alternative was introduced called *Nollalternativet* (i.e., allowing everything to remain as it is). The cost of the project was expected to be in the region of SEK 17–32 billion, depending on the alternative chosen. Below, the respective alternatives are denoted by *F*, *D*, *K* and *N*.

The Stockholm County Administrative Board concluded on August 16th, 2007, that road alternative *F* was to be the preferred alternative. This new stretch would add up to about 21 kilometres and cost between SEK 18–20 billion. Since this was to be one of Sweden's largest infrastructure initiatives, we found it important to understand the underlying decision-making process that concluded that this was to be the preferred alternative.

After several attempts, however, we found that we were unable to understand how the published material was supposed to work as a basis for decision [SRA, 2005]. Nevertheless, the background material is detailed and consists of about 80 different assessments of the three alternatives from 19 different perspectives (criteria). The material also contains various assessments with regards to how the alternatives arrive at the stipulated goals with respect to, inter alia, accessibility, environmental impact, regional development, traffic safety, and economic growth.

The assessments were made using two different scales: one yes/no scale, and one scale ranging from – – to + +, indicating to what extent the criteria were met relative to the alternative *N*. Furthermore, many assessments were made as intermediary statements, such as +/– or 0/+, and the best alternative for each criterion was marked, despite in some cases being given the same values. In particular, the scales implied some semantic issues, which were never clearly stated. Furthermore, there was no clarification of their properties. This means, among other things, that the aggregations of the assessments lacked semantics. On the other hand, no such aggregations were ever presented, which may be an indication that the Swedish Road Administration never viewed this as problem. Then, one may ask, why bother at all with expensive investigations in order to construct these reports, when they just could throw a die?

The dominant problem was, however, that there was no indication of any form of priority order between the criteria. Since there was no dominant alternative over any other, such a priority order was essential to enable an analysis to be conducted. This lack then led to a report that was impossible to assess or use. However, this did not matter, since the report appeared to be never assessed or used in any meaningful way.

Perhaps we should simply conclude that this particular decision problem was so complex that no rational method for evaluation could assist the decision makers. The Swedish Road Administration's study can be considered as a form of decision support and the only one available, albeit quite limited. However, this was far from the case. Decision analytical methods and tools do exist which are specifically aimed at these kinds of complex issues. The idea behind these methods is not to replace the decision makers but to support the analysis in a structured way. It is possible for the stakeholders to check, verify, and criticise the decision based on the documentation output at a later stage, which, because all consequences have been clearly presented, shows how all the alternative courses of action were valued and, preferably, the motivations behind the choices. During the process, comments regarding the analysis can also be made, which facilitates participation among different stakeholder groups.

Tools and methods supporting decision analysis when precise data is missing and subjective assessments are decisive and differ, are available, cf. e.g., [Danielson and Ekenberg, 2007; Danielson et al., 2007a; Danielson et al., 2007b; Danielson et al., 2008a; Ekenberg et al., 2006; Hansson et al., 2008a; Hansson et al., 2008b; Larsson et al., 2005]. The problem was that The Swedish Road Administration appeared not to have any knowledge of these methods or paid little regard to them.

1.2. Modelling and Evaluation

We investigated more closely how this particular problem could be analyzed in a reasonable way, using our earlier methods. In order to emphasize that this would not constitute any major effort, two rather junior undergraduate students from both Mid Sweden University and Stockholm University to construct decision models from the reports available at [SRA2]. It was rather simple to construct a model, which enabled it to be possible to carry out a very informative analysis and which pointed out which alternative that should have been preferred (or not preferred) together with robust investigations into this option.

Using a set of reasonable weight assessments together with ordinal rankings of the alternatives under each criterion, we concluded that alternatives *F* and *D* could be regarded as slightly better than the alternative *K* when the central criterion *accessibility* was considered to be most important. With respect to the *environmental impact*, alternative *D* was relatively good, even if alternative *K* appeared to be the best alternative relative to the overall environment and contribution to the reduction of CO_2 emissions. When both *environmental impact* and *traffic safety* were considered to be the most important criteria, *K* would be our preferred choice. See the Appendix for a brief presentation of a decision methodology.

What we would like to emphasize is that the crucial issue in this decision problem is how the weights for the different objectives/criteria are assessed. It is not possible to find this in the investigation conducted by the Swedish Road Administration.

1.3. Final Remarks

At this point we stress that we do not in any way wish to de facto support any of the alternatives as being the superior option. Nevertheless, we find it remarkably troublesome that investments of this magnitude appear to have been initiated without a more qualified decision apparatus where priorities, weights, and values are already openly expressed in the evaluation phase. As far as we are concerned, it is not reasonable that public means and funds are used in this manner and we are under the process of creating a more systematic and transparent framework for public decision making [Danielson et al., 2008b].

It is tragic that this is by no means an isolated event. It seems reasonable that authorities should generally take expensive and complex decisions more seriously and actually utilize the support methods and decision tools that do exist. It is unfortunate and quite inconsistent with the democratic idea that the public decision processes is incomprehensible to the people who ultimately pay for the entire project. This becomes even worse if the decisions made are based on an erroneous basis due to a lack of any elaborate analysis.

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Appendix

A.1 A Decision Method

The below outlined decision tool and process is designed to meet the following requirements.

- A description of the alternative options available
- A description of the criteria (perspectives) under which to view the alternatives
- A description of the consequences for each alternative with respect to. each objective/criterion
- A procedure that can evaluate and compare the alternatives, taking all relevant criteria into account while aiming at transparency and cost efficiency

The process has been used previously in public decision making, for example in a large decision problem involving many stakeholders, viz. the design of a public-private flood insurance system for Hungary [Ekenberg et al., 2003]. That project was a multi-stakeholder policy decision problem and involved IIASA (*Institute of Applied Systems Analysis*) and the Hungarian Academy of Science. The stakeholders included, among others, the public in the high-risk and low-risk areas, the insurance companies, and the government. The design of the nation-wide insurance system involved handling imprecise information, including estimates of the stakeholders' utilities, outcome probabilities, and criteria weightings.

The methodology incorporates a general multi-criteria-multi-stakeholder approach, readily equipped with evaluation methods integrated into a common framework for analyzing decisions where we have uncertainty, conflicting objectives, and multiple stakeholders. Conceptually and computationally, the process is based on the Delta decision method [Danielson, 2005]. The method has been used and validated in several decision projects ranging from deposition of spent nuclear fuel in Sweden, over large purchasing decisions at the Swedish Rail Administration (around 1 billion Euro) and investment analyses [Danielson et al., 2003], with reference to the aforementioned Hungarian study. The method has been packaged into a decision tool that accompanies the process presented in [Danielson et al., 2007a].

A.2 Representation in the Tool

The tool is built around an input and representation – calculation - output presentation work process typical of decision making and evaluation in most projects. The decision problem itself is to select an alternative from a set of alternatives by conforming to reasonable principles of rational behavior such as the principle of utility maximisation. In other words, to identify the alternative with the most favorable evaluation results given a set of preconditions. Those preconditions deal with, e.g., the possibility of unacceptable outcomes, and the rejection of alternatives with such content. Such methods are referred to as security thresholds methods and have been shown to successfully complement the principle of maximizing the expected utility in a decision process [Ekenberg et al., 2001]. Ideas from uncertainty representation and computational decision evaluation are thus collected in a decision tool.

In the method, a decision frame represents each decision problem. The idea behind such a frame is to collect all the information for the model in one structure. This structure is then filled in with input statements. All the criteria (perspectives) weight information (priorities) in each of the three decision problems share a common structure because they are all made relative to the same decision frame. The user statements are collected together in a weight base, which is a formal representation of a priority order. For value or utility statements, the same is done in a value base.

It is generally the case that there are no precise numbers available to input into the model. For instance, we cannot obtain statements such as “cost is 1.2 times more important than safety” in any reasonable or useful way. There may not even exist, at least in the beginning of a decision process, interval statements of these kinds which are sufficiently narrow to yield results by themselves. Then, qualitative information (e.g. in the form of comparisons) becomes important. Even if there is no reasonable interval information available, a decision maker is often able to rank e.g. consequences or outcomes in the sense that it can be said whether two values are approximately equal or whether one objective is more important than the other.

A decision problem can be analyzed on two levels; either one criterion at a time, or all (or for a set of) criteria at the same time, using priority statements and models such as weight trees or together with aggregation rules. In the same way, the criteria are subject to an embedded sensitivity analysis of the weights’ influence on the total evaluation of the multiple criteria decision problem.

A.3 Evaluation and Sensitivity Analysis

The sensitivity analyses attempt to show what parts of the given information were most critical for the obtained results and must therefore be subject to careful additional consideration. It also points out which information is too vague to be of any assistance to the ongoing evaluation. Information identified in this way was subject to reconsideration, thereby triggering iteration in the process.

Sensitivity analysis is made by modifying the input statements in various ways, either manually or by means of embedded automatic methods, and by investigating the robustness of the evaluation result. One embedded method, called contraction analysis, reduces the widths of the intervals for the values and weight. This contraction results in a “belief cut” in the sense that less reliable, more peripheral parts of the intervals are cut off and new evaluations performed. In the case of two opposing views, i.e. the interval embraces two polarized standpoints; the contraction represents a simultaneous compromise on each part. Whether or not the contraction can be carried out then depends on the respective parts willingness to compromise in this particular instance. It can be said that the greater the contraction level (from 0% to 100%) required in order to conclude preference, the less support we have in our user statements for this and the basis for the decision must be complemented with additional information.

A.4. Modelling and Evaluation Attempt

Translating the information in [SRA, 2005] into a decision model for the tool is rather straightforward. It basically consists of the construction of a tree model (Figure A1) and then entering ordinal rankings for each alternative with regards to each criterion, consistent with the information in [SRA, 2005]. This is, in essence, the information we obtain from [SRA, 2005].

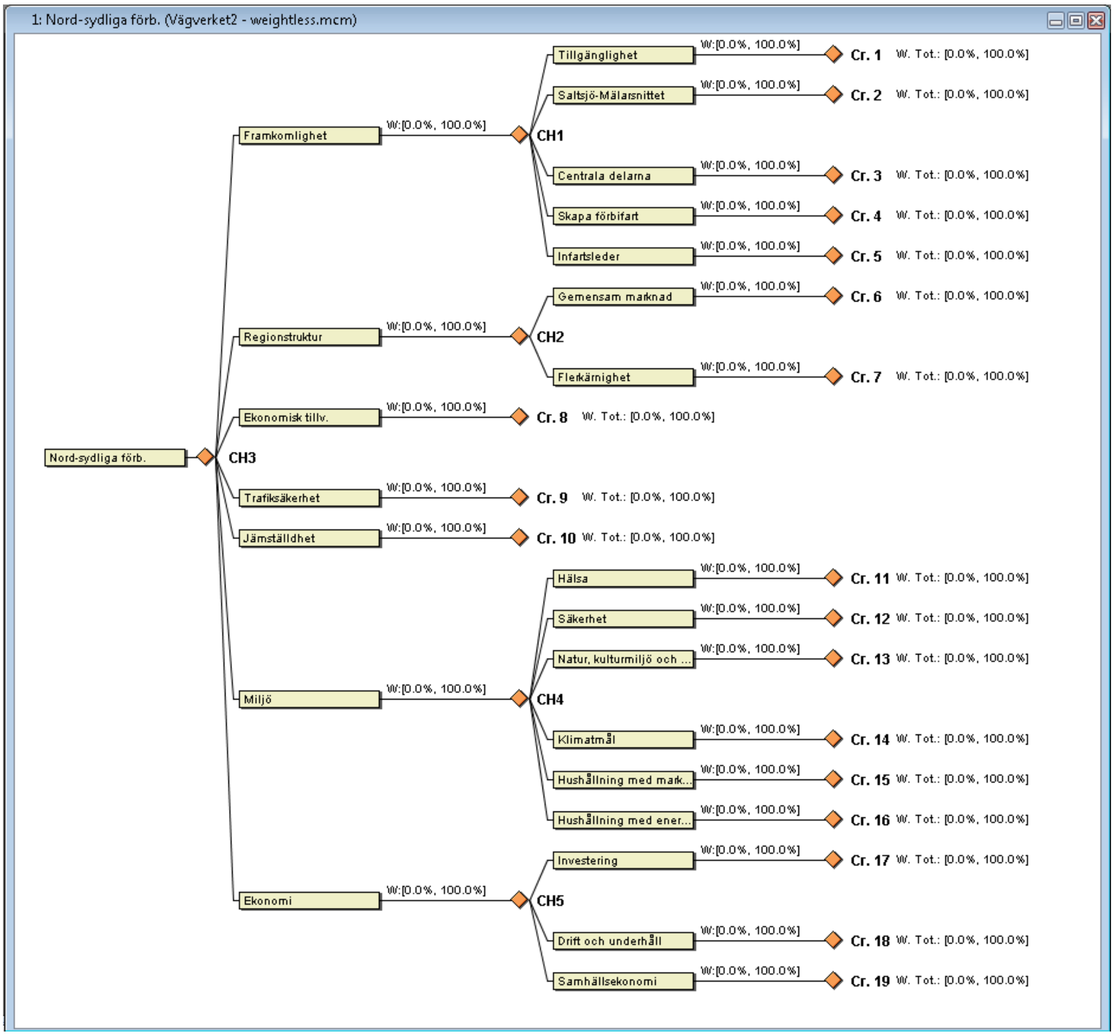

Figure A1. Criteria tree of the road selection issue.

Once the structure has been created and available data is entered into the model, various types of decision evaluations supporting imprecise data may be performed. The evaluations shown in Figure A2 is labeled as *Cardinal Ranking*, and may be considered as a generalized evaluation method for decision analysis [Danielson, 2005] Overlap between the bars, i.e. expected utility, indicates that there are instances in the solution space that favor different alternatives. The cardinal ranking presents a rather detailed overview of the ranking of the alternatives, based upon a contraction level.

Although the cardinal ranking showing the top ranked alternative for the issue being Alt. 1 for one reasonable set of weighs, we notice that we must allow for a contraction level of 95% in order for the alternatives to be separated. Thus, the basis for the decision should be made less vague not only with respect to weights but also for the consequences of each alternative relative to the criteria. When omitting weight statements, it proves impossible to discriminate between the alternatives. This is understood from the leftmost cardinal ranking shown in Figure A2.

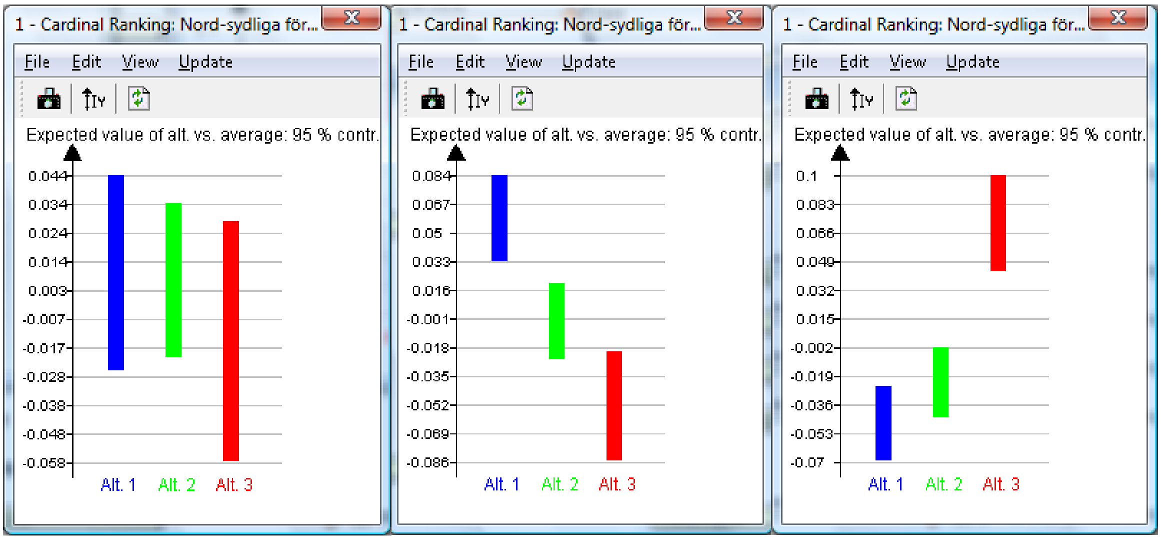

Figure A2. *Left*: Without any weight assessments. *Middle*: Accessibility is considered as the most important criterion. *Right*: Environmental impact and traffic safety considered as the most important criteria. Alt 1 is *Förbifart Stockholm*, Alt. 2 is *Diagonal Ulvsunda*, and Alt. 3 is *Kombinationsalternativet*.