Improving attribute weight assessment: an instrument for decision makers

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1: Introduction

Making a decision means choosing between options. In order to make a sensible decision, the attractiveness of these options has to be assessed. If you want to buy a car, the cars available on the market (the alternatives or options) can be described in terms of their top speed, price, fuel consumption, and other attributes. Which car you buy not only depends on the scores on these attributes (for example: how fast can car X go?), but also on their importance; also referred to as their weights. If top speed is important to you, you may buy that expensive but cramped Ferrari. But if you have to take the kids to school each day, roominess may be more important than top speed and you'll buy a Volkswagen. In this paper, we focus on the thinking activities that actors (decision makers and people who support them, like consultants) go through when establishing for themselves the importance of attributes. Together, we call these activities: the importance assessment process (see Section 2.2). We present a one-day course for improving the quality of the importance assessment process, so as to enhance the quality of decisions.

Thinking about the importance of attributes can mean, for example, finding arguments why a certain attribute is more important, or less important, than another attribute, or thinking about the precise meaning of attributes. The importance assessment process results in the importance judgment; the assigning of weights to one or more attributes. We are not interested in the importance judgment, but in the importance assessment process (how do actors think on their way to the importance judgment). In previous research (Heerkens, 2003; Heerkens, 2006; Heerkens & Van der Heijden, 2003; Heerkens, Norde & Van der Heijden, 2011), a number of inadequacies were identified in the mental processes actors go through during importance assessment processes under experimental conditions. Based on this

knowledge and on discussions with actors involved in strategic decision making in both private and governmental organizations, we developed a course for decision makers and advisors aimed at providing simple, practical tools for improving the importance assessment process. The objective of this article is twofold: (1) to report on the development of the above-mentioned course; and (2) to assess the strengths and weaknesses of the course. We limit ourselves to non-routine organizational decisions as explicit weighing is highly relevant in these circumstances, and is often an element of formal decision procedures. In routine decisions, on the other hand, the actors involved usually have a fair idea of the weights of relevant attributes, be it explicitly or implicitly, and explicit weighting may not be necessary or efficient.

This article is relevant for those concerned with improving the quality of decision processes in organizations. Specific tools are described for enhancing importance assessment processes. It is also relevant for decision makers. They may reflect on how consciously they make importance assessments, and whether they encounter some of the pitfalls described in this article.

This contribution starts with addressing the theory of importance assessment and identifying some pitfalls actors may encounter while assessing the importance of attributes (Section 2). With the course we developed, described in Section 3, we aim to address some of these pitfalls. In order to asses the strengths and weaknesses of the course, we conducted it in a number of organizations and evaluated it. The evaluation results are presented in Section 4, followed by a discussion in Section 5 on possible improvements and the embedding of importance assessment support instruments in organizational decision processes.

2: Importance assessment; theoretical background

In Section 2.1 we briefly review research on attribute weights and show that little research has been done on importance assessment and, consequently, on how to improve the importance assessment processes of actors involved in decision making. Then, in Section 2.2 we describe a generic importance assessment model. In Section 2.3 we use this model to identify pitfalls that actors may encounter while assessing the importance of attributes.

2.1: Previous research concerning attribute weights

Extensive research has already been done concerning attribute weights. The main topics in this research relevant for this article are:

1: Measuring weights. There are a number of methods for measuring attribute weights (Goldstein & Mitzel, 1992; Jaccard, Brinberg & Ackerman, 1986; Keeney & Raiffa, 1976; Sipari & Timor, 2010), like simply asking actors to mention them, the Analytic Hierarchy Process (AHP) and other methods of pairwise comparison (Saaty, 1980), and the structural method in which weights are derived from a series of hypothetical choices presented to actors (i.e. Harte & Koele, 1995). There are also methods that help actors to derive weights from higher-level goals, like Value-Focused Thinking (Keeney, 1992; Keeney, 1994; Léon, 1999). However, measuring weights gives few clues as to by what thinking processes these weights were arrived at. Hence, knowledge about the measuring of weights is not likely to help actors very much with assessing the importance of attributes.

2: Factors that influence the weights given. Examples are; the way the decision context is framed (Beach *et al.*, 1996; Carlson & Klein Parero, 2004; Sood & Forehand, 2005), the range of attribute values of the options to be chosen from (Beattie & Baron, 1991; Fischer, 1995, Goldstein, 1990), the role of proxy attributes (Fischer *et al.*, 1986), the number of sub-

attributes (Borcherding, Schmeer & Weber, 1995), the value of weight measuring methods in marketing (Danaher, 1997), and the consequences of the need to justify decisions or avoid regret (Arkes, 1996; Hagefors & Brehmer, 1983; Svensson, 1979; Svenson, 1992). This research provides insights into general characteristics of the thinking process of actors, but it does not elaborate on specific mental actions. For example, we can associate certain behaviours with the desire to avoid possible future regret, but this is merely a general motive. *How* this motive is converted into attribute weights does not become clear, only *that* it influences the weights given. Consequently, this area of research treats the importance assessment process as a ´black box´ and is of little help for developing instruments aimed at improving this process.

3: The way in which weights, once established, are used in decision processes (see for a recent example Panagiotou, 2008). Much attention has been devoted to group choices on the basis of group members' judgments (see for example, Bose & Paradice, 1999; Fraidin, 2004; Grofman & Feld, 1992; Hollingshead, 1996; Janis, 1972; Kray, Thompson, & Lind, 2009). However, we are interested in the mental processes *before* weights are established.

To conclude, the importance assessment process is still largely a 'black box'. To our knowledge no instruments exist that are explicitly directed at helping decision makers with it. The lack of emphasis on the importance assessment process in organizational decision making was acknowledged in organizations where we tested the instrument. We aim to contribute to filling this void.

The next section gives a summary of what is already known about the importance assessment process.

2.2: Previous research on importance assessment: the Weight Assessment Model (WAM)

In this section, we address the core characteristics of a descriptive model of the importance assessment process that we use to identify pitfalls that actors can encounter, and that have been addressed in the design of our course. We just present the elements of the model that are essential for understanding the pitfalls we identified. We do not discuss the research that formed the basis of the model, or analyze its merits. So, we take the model ´as is´, a mere frame of reference for developing our course. The variables we assess in this paper pertain to the success of our course, not to elements of the model. The model is based on previous research [(see Heerkens (2003), Heerkens and Van der Heijden (2005), and Heerkens, Köster, and Ulijn (2010, in press) for details of the research approach].

The Weight Assessment Model (WAM) consists of seven phases. These phases are:

Phase 1: Problem identification: activities like elaborating on the task at hand (understanding, concretizing) and re-formulating it in one's own words.

Phase 2: (Sub-)attribute processing: giving the attributes a more precise, or different, meaning. Attribute properties like measurement level, measurement unit, level of abstractness, and precision can change as a result of processing. Several forms of processing were identified (Heerkens, 2003), but the only one relevant here is decomposing: splitting an attribute into sub-attributes. For example, you can split 'safety of a car' in sub-attributes like 'quality of the brakes' and strength of the bodywork'. This gives the actor a more detailed idea of the meaning of an attribute and makes it possible to give the sub-attributes separate weights. There can be several reasons for wanting to give weights to sub-attributes. For example, actors may feel that sub-attributes are more concrete, more tangible, than the main attributes they are derived from, and hence easier to assign weights to. As we shall see, most of the pitfalls that the subjects in our research encountered during the importance assessment process pertain in one way or another to Phase 2, so this is the most important phase for understanding the rationale behind our course.

Phase 3: Absolute (sub-)attribute weighing: making a statement about the importance of a (sub-)attribute without making any reference to the importance of other (sub-)attributes ('safety is important').

Phase 4: Homogeneous sub-attribute weighing: weighing one sub-attribute against another one of the same main attribute ('good brakes are more important than a strong bodywork').

Phase 5: Heterogeneous sub-attribute weighing: weighing sub-attributes that belong to different main attributes against each other [good brakes (sub-attribute of 'safety') are more important than comfortable seats (sub-attribute of 'comfort')].

Phase 6: Attribute weighing: weighing of the main attributes ('Safety is more important than comfort').

Phase 7: Evaluation: reflections on activities, and on the results.

In the next section, and based on the WAM, we describe some of the main characteristics of the ways in which the subjects in our research performed their importance assessment tasks, and the pitfalls they encountered.

2.2.3: Behaviour and pitfalls in importance assessment and the goals of our course

In this section, we summarize the main conclusions we have drawn from our previous research, and their implications for the design of the importance assessment course. We refer to Heerkens (2003), Heerkens, 2003; Heerkens, 2006; Heerkens & Van der Heijden, 2003; Heerkens, Norde & Van der Heijden, 2011) for full details. In Section 3.2, we link the conclusions to the various assignments in our course.

1: Much attention (more than 30% of the total effort) was devoted to Phase 2 of the WAM (sub-)attribute processing). Phase 2 is an important building block for the rest of the

process. If mistakes are made in giving meaning to attributes, actors may not weigh the attributes they think they are weighing in subsequent phases. Therefore, we devote special attention to this phase in our course. Three of the 6 assignments (2, 3 and 5, see below) are devoted to Phase 2, while two assignments (1 and 6) partly pertain to this phase.

2: In Phase 2, subjects did not define attributes but they appeared to split them up in a large number of sub-attributes. The lowest average for any attribute across any of the groups we researched was 18.3. This indicates that splitting is a significant activity for giving meaning to attributes. Therefore, in our course, we chose to draw the participants' attention to the benefits of defining attributes (see also point 4). In case splitting is preferred, we provide means to make the splitting as productive and effective as possible.

3: Subjects appeared to conduct the assessment process rather unstructured. For example; no subject seriously tried to adhere to completeness, independence and non-redundancy, as is required for proper weighing (Vincke, 1992). Moreover, no-one made a causal scheme, cognitive map or other representation of the relationships between (sub-)attributes. Therefore, we devote attention to the role of structuring the assessment process, especially Phase 2, in the course design.

4: No subject appeared to formulate a common denominator for the two attributes (safety and comfort), such as, for instance, 'money'. Such a denominator can have the function of 'utility' or 'attractiveness' in models that are often used to assess options, like the linear additive method (Keeney & Raiffa, 1976). It is, so to say, a good way to 'compare apples with oranges'. Therefore, we devote attention to it in the course.

5: Subjects appeared to deliberate about the meaning of 'importance', yet, only in a very indirect sense. We do not know whether this influenced the importance assessment process, but we decided to address the question of the meaning of 'importance' in the course.

6: The relationships between the phases of the WAM are unclear. It can not be determined whether, or in what way, a certain phase is a building block for subsequent phases. Therefore, we have decided to take the WAM only as a framework for the course design, addressing its phases, but without advocating a phased approach. The WAM itself is not addressed in the course.

All this led to the following course aims: (1) To make participants aware of the relevance of the importance assessment process in decisions; (2) To make participants aware of the various activities that may take place during importance assessment (splitting versus defining, checking for completeness etcetera); (3) To make participants aware of possible pitfalls in the importance assessment process; and (4) To provide practice with some instruments that may be helpful in the importance assessment process.

These are short-term goals: at the end of the course the participants should have made progress on all these goals. But a course of – at most – one day will likely yield no lasting changes in the participants' attitudes or behaviour if no follow-up is given. Participants may get insufficient training during the course to be able to use the skills in practice afterwards. And even if they are able to use the skills within the context of the course, they may fall back to their normal routine under the daily pressures of work, or they will simply forget what they learned if they are not reminded of it. So we also have a long-term goal: (5): elements of the course (i.e. the assignments) should be suitable to be used (perhaps in modified form) in instruments designed for structurally improving importance assessment processes in organizations. In this way, what is set in motion during the course can be seamlessly followed up later in additional instruments. For example, elements of the course can be repeated so as to give actors more practical experience with them, they can be expanded (giving more difficult cases than during the course), or be referred to in further theoretical coverage of importance assessment processes.

Now that the aims of the course are clear, we can proceed to describing the course.

3: The importance assessment course

In this section, we provide some general guidelines, and an outline of the content of the course.

3.1: General guidelines

Firstly, we can not, and do not want to, prescribe how importance assessments should be conducted. The outcomes of our research – and that of others – do not allow this. We do not try to teach people to do the right things, but try to help them in doing the things that they do, right. For example, splitting attributes may not be the best way to start an importance assessment process from a theoretical point of view; defining attributes and finding a common denominator might be better. But since splitting attributes is what people do, our course aims to help them doing it right.

Secondly, we want to make participants conscious of what they are doing, and what they could do differently, during the importance assessment process, rather than to have them develop a 'one-size-fits-all' importance assessment method. Instilling the desire and the ability to develop importance assessment skills is more important than teaching the skills themselves.

Thirdly, the course should not last longer than one day, so as not to discourage people to take part in it. This limitation was chosen intuitively but proved valid when seeking

opportunities to test the course. This implies that our short-term goals (1 to 4) took precedence over our long-term goal (5).

3.2: The course programme

The course programme is given in Table 1.

PLACE TABLE 1 ABOUT HERE

The course as it is evaluated in this article starts with a short introduction of the main elements of a decision (options, attribute scores, attribute weights) and the role of importance assessment, followed by Assignment 1. In this assignment, the participants are invited to weigh 'safety' against 'passenger comfort' in the case of a transport company wanting to buy a fleet of minibuses. This is followed by a feedback session in which the participants are asked how they conducted the assignment. Issues raised are, for example: did you define attributes or did you split them? If you split them, did you check for completeness? Did you, looking back, consider only a limited number of weights? In this way, the participants are introduced to possible courses of action that can be chosen during the importance assessment process, and, to a certain extent, became conscious of the way they work.

Assignment 2 comprises an exercise in splitting an attribute. The participants go through the following cycle:

- Formulate a global description of 'safety' (not an exact definition).
- Formulate splitting criteria (like active versus passive safety features).
- Split 'safety' in as many attributes as you can think of, using the splitting criteria as inspiration.

- Try to come to a more formal definition of ‘safety’.
- Go through this cycle until no new knowledge is gained.

In this way, participants practice with both splitting and defining (as a possible basis for a common denominator), using one as the inspiration for the other. In a short feedback session, the various splitting criteria and definitions, and the way the participants reached them, are discussed. This assignment is designed to address points 2 and 3 in Section 2.2.3: subjects in our research devoted much effort to splitting but did not do this systematically.

In Assignment 3, the sub-attributes of Assignment 2 are put into a causal scheme, a so-called ‘cognitive map’ (De Boer, 1996). Simply put, the sub-attributes are connected by arrows going from cause to effect. Even more important than establishing ‘cause and effect’ relationships, is the elimination of overlapping or redundant sub-attributes. For example, some participants may take ‘vehicle weight’, ‘strength of the chassis’ and ‘braking distance’ as sub-attributes of safety. Obviously, a strong chassis may weigh more and a heavier vehicle is likely to have a longer braking distance. All other things being equal, weight has no direct influence on safety, and as such is not important in itself. So it can be left out. In Assignment 3 participants learn to bring ‘method in the madness’ of sub-attributes as a prelude to weighing them. This relates to points 3 and 4 in Section 2.2.3: we aim to make the processing of (sub-)attributes more systematic so that superfluous attributes can be eliminated and a common denominator may be found by establishing empirical relationships between (sub-)attributes. For example; it may become clear that there are relationships between cost and some other attributes. Cost may then serve as a common denominator.

Assignment 4 comprises a plenary discussion about the meaning of ‘importance’. It is not clear whether this knowledge actually contributes to a better importance assessment process, but we take it into account as we think it contributes to more awareness about the

process. In Section 2.2.3, we saw that our subjects did not deliberate systematically about the meaning of 'importance'.

Assignment 5 is similar to Assignment 1 (weighing two attributes against each other), but with attributes that pertain to the working environment of the participants. For example, during a course for people who buy airplanes and maintenance services for KLM Royal Dutch Airlines, we used characteristics of airplanes as attributes to be weighed. This assignment gives the participants the opportunity to practice what they learned in Assignments 2, 3 and 4, and hence addresses points 2 to 4 in Section 2.2.3. In the feedback session held afterwards they reflect on the practicality and usefulness of what they learned.

Assignment 6 is not directly based on our earlier research, but on feedback and ideas developed during a pilot session of the course, and on interviews with decision makers about possible desirable content of the course. It concerns the handling of attributes that participants feel to be important without initially being able to give rational arguments for this. The assignment starts with finding any and all (so also irrational) arguments for the importance of an attribute (for example: maximum speed is important for me because I like the sporty image of fast cars). Subsequently, the participants derive new attributes from these arguments (in this case: 'image'). Then they assess what other attributes determine the image of a car (for example: the price), and what desirable consequences a good image of a car could have (like getting attention from the opposite sex). After a number of questions like these, the attributes generated are represented in a cognitive map. In this way, irrational or intuitive arguments are made explicit and, if desired, can be taken into account when weighing attributes.

The programme for the first half-day ends with a discussion session in which remaining issues brought up by the participants are addressed. In the second half-day, a lecture is given about decision theory, expanding beyond importance assessment, and touching upon issues such as the phases of a decision process, scaling attribute scores, group

decisions, and the like. After that, an importance assessment problem provided by the organization is discussed. In the case of KLM, we tried to assess the importance of various attributes concerning the choice of a sub-contractor to maintain one of KLM's aircraft types.

4: Evaluation of the course

The course was given for employees of Amsterdam Schiphol Airport, twice for groups of KLM Royal Dutch Airlines, and twice for the Royal Netherlands Air Force. 57 persons followed the course. Only in one occasion (KLM, 14 persons) was the second half-day part (see above) conducted, so we leave it out of the evaluation. At the end of each course, the participants filled out an evaluation form. All in all, 55 persons filled out the form, although some of them omitted a few questions.

The evaluation form consisted of eight multiple-choice questions (with sub-questions) using a four- or five-point rating scale, and 3 open questions. We only address the remarks made in the open questions if they provide a clear indication of strengths and weaknesses of the course, if they signify a trend, or if they are logically relevant (so not just isolated private preferences of a single participant).

In the evaluation, we have taken the course goals given in Section 2.2.3 as a frame of reference. First we examine the short-term goals (1 to 4).

Goal 1: Make the participants aware of the relevance of the importance assessment process in decisions.

The extent to which the participants learned about the relevance of importance assessment was 2.89 on a scale from 1 to 4 (1 was 'nothing', 2 was 'little', 3 was 'reasonably', and 4 was 'much') (N = 55). This is somewhat below our (intuitive) target score of 3.0. In the open questions, it was indicated that the subject was rather abstract, and that there was a need for

more explanation, clearer examples, and more specific feedback on the assignments. The last point has been addressed by giving written feedback on the assignments that the participants could study afterwards. However, this did not show in the evaluation forms, which were filled out immediately after the course. It is likely that the participants, who have a practical and not a scientific background, needed more time and opportunity to grasp the essentials of the importance assessment process, at least in the way they were presented in the course.

Moreover, the course might have been too much of a series of assignments, without sufficient attention to the theoretical framework that integrated the assignments. Finally, importance assessment did not seem to be an issue in the organizations concerned, prior to sharing with their representatives our suggestion it should be. This is not surprising, given the lack of research in this area (see Section 2.1). Thus, it is logical that participants in the course need some time to grasp the theoretical framework of the course.

Goal 2: Make the participants aware of the various activities that can be considered when performing an importance assessment.

Regarding the issue to what extent the course helped in getting a clear idea of how to assess the importance of attributes, the average score was 2.72 (N = 50), which is again somewhat below the target of 3.0 using the same four-point scale as for Goal 1. The main cause might have been the same as the one regarding Goal 1: given the practical background of the participants, it may have been difficult for them to put the assignments into perspective. This is all the more likely since the separate assignments are judged favourably (see the next paragraph).

Goals 3 and 4: Making participants aware of potential pitfalls in the importance assessment process and letting the participants practice with some instruments that can be of help with the importance assessment process.

PLACE TABLE 2 ABOUT HERE

The relevance of the assignments scored between 3.74 on a five-point rating scale (Assignment 4; discussing the meaning of 'importance') and 4.00 (Assignment 1; making an unassisted importance assessment). The number of participants that answered this question about relevance was 47, except for Assignment 5 that was omitted in all but one of the five courses due to time constraints. The clarity of the assignments scored between 3.47 (Assignment 3, making a cognitive map) and 3.90 (Assignment 1) (N = 47) on a five-point rating scale. These figures are well above the target minimum of 3.0. The level of difficulty was scored between 2.66 (Assignment 1) and 3.55 (assignment 6; handling non-explicit arguments) on a scale of 1 to 5, with 3 being 'neither easy nor difficult' (N = 47). So, the individual assignments were all scored rather favourably. The improvements that were suggested comprised: more explanations beforehand, more elaborate feedback, more time for discussion, and more 'depth' in the course, even at the expense of the number of assignments. These relatively high scores, especially in the case of relevance of the assignments, may imply that the quality of importance assessment processes, and the skills needed for it are indeed an issue within the organizations that took the course, even if the participants may not have realized this before starting the course. It shows the relevance of what we are trying to achieve in the course. The scores also imply that the assignments seem to be a good approach to teach importance assessment skills.

Now we turn to the long-term goal (5): *Elements of the course should be suitable to be used (perhaps in modified form) in instruments designed for structurally improving importance assessment processes in organizations*.

The feedback discussions after each assignment were, in our opinion, of good quality. Relevant questions were asked, problems encountered while executing the assignments were

properly identified, and the answers the teachers gave were generally understood, as far as could be judged from subsequent discussions. Given the above, and the scores on relevance, clarity and difficulty of the assignments (see Goals 3 and 4), we believe that the quality of the assignments is good. The participants understood them, could fulfil them and could reflect on them properly afterwards. So we see no reason why they cannot serve as a basis for more elaborate instruments, but how and to which extent this is to be done falls outside the scope of this paper.

Our conclusion is that while goals 1 and 2 were not entirely fulfilled to the extent that we would like, this is made up for by the level of achievement of goals 3 and 4. However, as noted in Section 3.1, even if the goals of the course are fulfilled, lasting effects are not to be expected of any intervention, however successful, that lasts only half a day to a day. We believe that more is needed than just a further improvement of the course. The context in which the course is given should be improved as well. As far as improvements of the course are concerned, the most important one is the supplying of elaborate written feedback on the assignments. Other improvements, like more in-depth explanation of the theory, simply cannot be realized within the duration of the course, but it is no problem at all to realize this in a more elaborate training programme aimed at embedding importance assessment skills and procedures in an organization. Elements of the course can be used for this (goal 5).

All in all, we think that the course in its present form provides a good way of introducing the concept of importance assessment in organizations, making actors aware of its relevance, showing that there are pitfalls that should be attended to if sound importance assessment processes are to be achieved, and letting actors experience how importance assessment skills can be improved. Our results also show the challenges that can be encountered if one is trying to improve importance assessment processes.

5: Discussion

The problem addressed in this article was twofold: to develop an instrument to contribute to improving importance assessment awareness and skills, and to assess its strengths and weaknesses. Its strengths are, according to the evaluation outcomes, that participants feel they now have a better idea of the relevance of the importance assessment process, and of how to assess the importance of attributes. Overall, we consider the course a success, but the degree to which two of the five goals were achieved, was not as high as we wanted, and the long-term effects of the course are probably limited without further follow-up. But this is not a weakness of the course; it is an inherent limitation of any introductionary tool. Improving organizational importance assessment processes is a major operation. Such organizational change operations often need a distinct starting point. The course can fulfil this function effectively and efficiently; it takes the participants little time and is a good introduction to the importance assessment processes that are the subject of the organizational change. It also makes clear to decision makers that there is such a thing as importance assessment and that the quality of importance assessment processes can indeed be improved. These notions may secure support for efforts to improve importance assessment processes.

If an organization has the ambition to devote attention to importance assessment processes in a structured way, this can be done by, for example, giving explicit attention to importance assessment during decision processes (as opposed to just eliciting attribute weights). If an organization wants to do this, then a trajectory can be developed to educate employees in importance assessment. Based on the experience in giving the course and in dealing with importance assessment issues in various contexts, we suggest that organizations wanting to devote systematic attention to importance assessment take the following steps. The course, or elements of it, can be used in steps 1 to 3.

1: Make actors involved in decision making aware that importance assessment is not the same as eliciting weights. Although some weight eliciting methods like AHP (Saaty, 1980) may induce thinking about weights, this is by no means a certainty. How this awareness is to be achieved depends on the situation. It is probably best to address the most senior management level, where non-routine decisions with strategic consequences take place and where new insights about how to make good decisions are welcomed.

2: Make actors aware that part of the deliberations taking place during decision processes involve attribute weights (as opposed to scores).

3: Train a limited number of key actors involved in high-pay-off non-routine decisions in the issues taught in our course, and help them to implement the acquired skills in decisions in which they are involved. The assignments in our course can be used as a basis for this training.

4: Identify moments within (in)formal decision procedures where importance assessment is relevant, and point them out to the participants.

5: Together with some key actors who were involved in Step 3, insert importance assessment support instruments in (in)formal decision procedures within the organization.

6: Finally, set up a training programme to train and maintain importance assessment skills for all relevant actors in the company, and to instil an 'importance-assessment-awareness' culture in the organization.

Recently, we secured two PhD-project positions with KLM Royal Dutch Airlines with the aim of developing instruments for improving the quality of importance assessment processes. The course that was presented in this contribution can form a basis for this. An expanded version can be used for teaching skills thoroughly, instead of just getting acquainted with them. For Amsterdam Schiphol Airport, we are developing short courses that should provide members of crisis management teams (crisis being, for example, fires or aircraft accidents)

with a common importance assessment heuristic. This heuristic can be practice before a crisis is at hand, so that when needed the crisis management team members can co-ordinate their decisions more efficiently.

More information on the course, including an outline of the course materials, can be obtained upon request from the corresponding author.

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Table 1: Descriptions of the assignments of the course

Assignment	Description
1	Weigh safety against comfort in your own way
2	Split safety into sub-attributes
3	Make cognitive map of sub-attributes generated in assignment 2
4	Discuss meaning of 'importance'
5	Weigh two attributes with skills acquired in course so far
6	Handle attribute for which you have only 'intuitive' arguments

Table 2: Relevance, difficulty and clarity of the assignments (plus number of respondents N). Assignment 5 excluded since it was only performed once

Assignment	Relevance (N)	Difficulty (N)	Clarity (N)
1	4.00 (53)	2.66 (53)	3.90 (52)
2	3.92 (52)	2.72 (53)	3.84 (50)
3	3.91 (54)	3.50 (54)	3.47 (53)
4	3.74 (47)	2.83 (47)	3.49 (47)
6	3.83 (53)	3.55 (53)	3.54 (52)