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Facilitation practices in decision workshops

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Decision workshops, sometimes called decision conferences, help a group of decision makers gain a shared understanding of a decision problem, analyse issues and commit to an action plan under the guidance of an experienced facilitator. This work seeks to identify best practice in the early stages of the facilitation of such workshops when the emphasis is placed on problem structuring and the main issues of a complex decision problem are identified and explored. Four decision workshops, based on the same hypothetical scenario but facilitated by a different person, were organized. Video material of the simulated workshops was analysed to compare and contrast the facilitated meetings including the problem structuring methods used. A framework for studying facilitation practices emerged. The effect of a facilitator on the structuring of the problem, the group decision process and the outcome of the workshop was studied. The results of the work indicate that a facilitator's style and approach to the workshop may have an impact on the action plan devised. Further research is required to generalize the findings of our work.

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Introduction

Over the past 30 years, there has been wealth of development of creative brainstorming and problem structuring methods (PSMs), often dubbed soft systems/methods/OR. The UK has led the development of PSMs, see for example Bennett (1977), Checkland (2001), Eden (1988), Eden and Ackermann (1998), Friend and Hickling (1997), Jackson (1991), Pidd (1996, 2004), Rosenhead (1980a,b), and Beer (1994). Until the last decade, the developments have largely been within silos, with each proponent claiming explicitly or implicitly that their methods are sufficient to explore and define perspectives on issues. However, recently there has been a more open acknowledgement of the complementary uses of these methods (Pidd, 1996, 2004; Rosenhead and Mingers, 2001; French *et al*, 2005; Eden and Ackermann, 2006).

The recent special issue of the *Journal of the Operational Research Society* on PSMs (see Shaw *et al*, 2006) presents a collection of papers that provide a historical overview of the field, reflect on recent, past and future developments and propose new methods or new roles for PSMs. A set of articles in the special issue highlight important issues, including a paper by Keys (2006) that emphasizes the need for developing new insights into the way that PSMs are used and expertise is accumulated so as to ensure the further development of PSMs.

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In this study, we seek to generate new insights into the way that PSMs are used in facilitated group settings. PSMs have maximum benefits in facilitated meetings or workshops where, under the guidance of a facilitator, a group of stakeholders (or their representatives) discuss and structure complex problems involving multiple actors, uncertainties and conflicting objectives (Mingers and Rosenhead, 2004). Thus, it would be of considerable interest to explore how facilitators use PSMs in group meetings. As Shaw (2006) points out, PSM workshops can act as sources for generating rich research data. We therefore use decision workshops as a vehicle for studying facilitation practices in PSM interventions.

Several studies provide facilitation guidelines in a variety of settings (Lane, 1992; Huxham and Cropper, 1994, Niederman *et al*, 1996; Griffith *et al*, 1998). It is clear that a facilitator should be able to use a range of techniques to support and understand the social and cognitive needs of the decision makers as well as lead the decision process while remaining neutral (Schuman, 1996). But how does he or she do this? There is a paucity of studies on how to generate the initial soft models within a group, or rather the studies that exist are focused on particular PSMs rather than how a facilitator with a bag full of soft modelling tools selects them in particular problems.

This paper studies how facilitators choose and use one or more PSMs/soft OR tools in order to help a group of decision makers explore and make sense of a complex problem. Our main objective is to compare problem structuring approaches, identify complementarities and fit with

characteristics of problems, group and facilitator. Another intention is to define a larger project that will look to designing and testing a software toolbox which would draw together many soft OR methods into a common framework which could be used to support distributed decision making over the Internet (or an organization's intranet). In a sense, this study builds on an earlier study with similar format run at a *European Association of Decision Making* SPUDM conference (French *et al*, 1998). However, the comprehensive videoing and playback facilities that we used in this work provided the opportunity for much more detailed recording of the group and facilitation processes.

A dedicated laboratory was used to compare the methods in partially controlled circumstances with full video recording of the processes in order to draw preliminary views on good practice in using and combining PSMs. We run four simulated decision workshops in which the same hypothetical scenario and set of issues were presented to four different but comparable groups. Four facilitators guided the discussions and helped the groups structure the decision problem using a range of soft OR tools. We then studied the recorded workshops to compare the facilitators' methods, styles and intentions, identify patterns and establish facilitation practices in PSMs.

The outline of the paper is as follows. In the next section, we briefly outline PSMs and soft OR methods for structuring decision problems under the guidance of a facilitator. We then describe the CAMaR laboratories and discuss the design of our research methodology and study. This is followed by an analysis of the observational data collected from the four workshops. The results of an open-ended questionnaire administered to the participants and the findings of our in-depth interviews with the facilitators are presented next. We then present a conceptual framework for studying facilitation practices and discuss the main findings of the study. Finally, we reflect on the study, outline lessons learned and discuss the conclusions.

Soft approaches to structuring decision problems: a facilitator's perspective

General surveys of soft modelling tools and PSMs are available in a number of texts (Rosenhead and Mingers, 2001; Pidd, 1996, 2004) and special issues of journals such as the 2004 special issue of the *European Journal of Operational Research* on 'applications of soft OR methods' (see for example the paper by Mingers and Rosenhead, 2004). The surveys suggest that there are many tools and techniques within the broad heading of soft OR/PSMs and with a varying degree of formality that may help in problem structuring. We might mention:

- soft systems and cybernetics (Jackson, 1991; Beer, 1994; Checkland, 2001),
- cognitive maps, mindmaps (Eden, 1988; Buzan and Buzan, 1994; Eden and Ackermann, 1998; Ackermann *et al*, 2004),
- strategic choice (Friend and Hickling, 1997),
- qualitative versions of decision trees, influence diagrams, hypergames etc (Bennett, 1977; von Winterfeldt and Edwards, 1986; French, 1988; Adams and Avison, 2003),
- checklists for example, SWOT, PEST, CATWOE (Belton and Stewart, 2002; ten Have *et al*, 2003),
- process models, activity role diagrams (Warboys *et al*, 1999),
- rich picture diagrams (Checkland, 2001; Daellenbach, 1994).

The above list includes management models (eg SWOT and PEST) that are not often considered as soft OR tools. We argue that any prompt such as a list of keywords that can be used as a graphical 'aide memoire' tool to capture and explore thoughts and ideas is an appropriate instrument for structuring problems (French *et al*, 2005). If we take into account the characteristics of PSMs as outlined in Mingers and Rosenhead (2004) however, tools such as SWOT analysis are considered to be related to PSMs (but not listed as PSMs).

This study focuses on the use of PSMs rather than the application of decision analysis. There are a number of reported examples which show how a soft model leads into a more quantitative analysis (Belton *et al*, 1997; Bana e Costa *et al*, 1999; Hatfield and Hipel, 2002). Facilitators can use a range of soft methodologies such as causal maps for capturing and structuring the decision problem and then apply multi-criteria decision analysis or other techniques to evaluate the action plans identified in the problem-structuring phase (French *et al*, 1998; Montibeller and Belton, 2006). Using PSMs compliments and enhances multi-criteria decision analysis by generating deep insights (Belton, 2006).

Even though the facilitators of our study did not make use of ICT, we may note that computer tools have been developed over the years to help facilitators choose what questions to ask (Holloway and White, 2003), measure group consensus (Ngwenyama *et al*, 1996) and automate the facilitation of distributed meetings (Wong and Aiken, 2003). The role of ICT in facilitated group meetings is mainly to support information management and communication tasks while the facilitator concentrates on the group decision process (Phillips and Phillips, 1993).

Facilitated group meetings or decision workshops provide the setting for our research. Variables to take into account include:

- *Group size*: The effectiveness of a meeting declines as the size of the group increases (Grinyer, 2000). Decision-making tasks such as generating alternatives and converging on an action plan are more problematic in larger groups (Shaw *et al*, 2004).
- *Group composition*: The members of a group may have different personality types, backgrounds, training and education. These characteristics or rather the diversity of these characteristics may influence the extent to which a group is creative and innovative (Grinyer, 2000).

Figure 1 The CAMaR laboratories.

In our study, we had small and comparable groups of participants in all workshops. Our research methodology is presented next.

The approach and research methodology

CAMaR facilities

CAMaR (*C*entre for *A*pplied *Ma*nagement *R*esearch) was set up in November 2003 at the University of Manchester to support the development of innovative methods for studying the behaviour of individuals and groups in a controlled environment. The CAMaR laboratories provide a number of facilities which enable researchers to simulate a variety of working environments. In particular, it is possible to make synchronized multiple video recordings of behaviours in spaces configurable to various office and meeting room styles, as well as smaller rooms in which individuals may be observed in their use of IT, the web or similar technologies. At any one time, the output from four cameras can be monitored on screen and the cameras can be operated remotely to observe from many different angles. All material is recorded on high-quality digital recorders.

The CAMaR facilities were used in our project to simulate the decision workshops and study how a facilitator helps a group of decision makers structure a decision problem. The setting (see Figure 1) was a boardroom, equipped with whiteboards and flip charts. The room had four ceiling mounted cameras and microphones that allowed us to remotely observe the facilitators interacting with their groups from different angles (our approach is discussed in more detail in one of the following sections). It was possible to control the cameras and the sound recording from a control room behind a one-way glass screen.

The scenario

In today's competitive environments, managers are increasingly faced with 'wicked' problems or messes (Ackoff, 1974; Pidd, 1996, 2004). Such problems have the following characteristics (Courtney, 2001):

- They are one-off problems that may have some similarities with previous problems but have never been encountered before.
- Solving wicked problems may cause or worsen other interconnected problems.
- There are usually many stakeholders, often holding conflicting values and perspectives in the decision context, presenting the decision makers with the consequent need to interact with them and anticipate their actions.
- There is no right or wrong solution; there are either no solutions or solutions that are perceived to be good by some, but seldom all stakeholders.

Conventional wisdom has it that the problem structuring stage is key to solving wicked problems.

The scenario presented to the participants contains the elements of a wicked decision problem (see Appendix A). All the groups analysed and discussed the same scenario and were briefed similarly. The setting is a fictitious cosmetics company. The issue involves a number of stakeholders that have conflicting values and several decision actors with different priorities. Different parties own pieces of information and potential solutions have a considerable impact on the company's future operations and decisions. The participants of our study were asked to assume managerial roles and take a decision in the face of uncertainty. Depending on the role they assumed, the actors had their own agenda and concerns.

Research questions

Facilitators help groups of decision makers structure decision problems, using a variety of 'soft OR' tools to identify and structure the main issues of the problem (see the literature review section on 'soft approaches to structuring decision problems'). In this study, our general research aim was to compare how facilitators use PSMs in formulating decision problems and to identify complementarities and fit with characteristics of problems, group and facilitator. More specific research questions were:

1. How do facilitators guide the structuring of the decision problem?
2. How do their techniques differ?
3. How do the facilitators' styles differ?
4. How effective are they?
   And, if possible,
5. Can we identify elements of good practice?

Table 1 Session details

Session 1: Workshop	*Session 2: Evaluation feedback*
1. Introduction (0.5 h) 2. Decision workshop (1.5–2.5 h) 3. Questionnaire (10 min) 4. Discussion with participants (10 min)	1. Watch video recording 2. Discussion

Sessions

In order to analyse facilitated group decision processes and identify facilitation practices, we organized four decision workshops over a period of about three months. These were followed by evaluation feedback sessions in which we studied facilitation styles with the help of the facilitators involved in our study (see Table 1). Each workshop involved a small group of five to six participants who discussed a decision problem under the guidance of a facilitator. Four facilitators helped different but comparable groups analyse and structure the same decision problem. One of us (SF) had acted as facilitator at the first workshop; we felt it unfair to ask an external facilitator to experiment in an untried laboratory. The remaining three facilitators were external to Manchester Business School and the project. All the facilitators had considerable experience in facilitating decision workshops. The participants were mostly postgraduate (MBA, PhD, MSc) students who were asked to role play the meeting of a management team.

Each decision workshop started with an introductory session. The participants would discuss the project and the technology that was to be used with a member of the research team. They were fully aware that the session was going to be recorded. They were presented with a hypothetical scenario (Appendix A) and familiarized themselves with the details of the decision problem. The participants were allowed to ask questions about terms and keywords used in the scenario, but not to discuss the content with one another. They were then assigned a role (eg director of package development, PR manager, R & D director, marketing director and member of the research intelligence team) based on their background and personal preferences. Because they were postgraduate students in business and management they were familiar with the roles they undertook. Even though the participants were not provided with briefings about their roles, the scenario (see Appendix A) encouraged them to formulate their own agendas and clash with other members of the group who had conflicting agendas.

While the participants were analysing the scenario and becoming acquainted with their roles, the facilitator, who was not allowed to attend the introductory session, was given an individual briefing on the event and technology and also in the cases of the second, third and fourth workshops, a very short summary of the scenario five minutes prior to the start of the workshop (Appendix B). This was mainly because the scenario contained a number of terms and names of chemicals which the facilitator of the first workshop found rather confusing and difficult to pronounce and remember. This was not far removed from some real-life settings in which a facilitator has to familiarize him or herself with the domain of the problem in the opening session of the workshop. Because we wanted to observe how facilitators extracted the problem from the participants and what problem structuring steps they would take, we ensured that the facilitators were not fully briefed on the scenario before the event began. That included SF who did not have access to the scenario prior to his workshop (the scenario had been prepared by another member of the team (KNP)). Indeed, as we have already mentioned SF was not even provided with the summary of Appendix B and therefore he was slightly disadvantaged.

While the facilitator was guiding the discussions, the members of the research team observed the workshop remotely from the control room through its one-way window (see Figure 1). Four screens displayed the output of four cameras installed in the room where the workshop was taking place. As the results of the subjective evaluation feedback provided by the participants indicate, even though the participants were aware of the presence of cameras and microphones, they were able to discuss the decision problem freely. When necessary, the research team would change the direction of the noiseless cameras to focus on particular facial expressions, body movements and diagrams produced, which required the rapid development of media director skills. At the end of the workshop, the participants completed a questionnaire to establish their attitudes towards the facilitator's style, the tools used and the group decision process.

Following each workshop, the research team met with the facilitator to watch the recording of the decision workshop and analyse the group decision process. Whenever possible, this evaluation feedback session took place a day after the workshop to allow the facilitator to have a break and encourage all the parties to reflect on the workshop.

The evaluation feedback session allowed the research team to establish the following about the facilitators:

- how they helped the participants identify the main issues of the problem;
- why they had chosen particular problem structuring tools;
- how structured was the process they followed; and,
- what was the reasoning behind some of their actions and questions.

The facilitators seemed to value this opportunity to reflect on their performance, become aware of their mannerisms and habits and identify areas for improvement. A summary of the rough timetable of each workshop is given in Table 1.

Research methodology

Good scientific practice would be that we had completely designed our research methodology prior to running the workshops. However, our approach was somewhat evolutionary due to the newness of the laboratories, the need to explore what was possible with the facilities and an equipment upgrade to meet the laboratories' original specifications.

Initially, four members of the project team, working individually, watched the tapes and reviewed recordings of a pair of the sessions and noted their impressions, the interventions and techniques used and the order in which they were deployed. They noted their observations in the form indicated in Appendix C. The tapes showed the output of all four cameras, synchronized, each in its own quarter screen, allowing two sides of an interaction to viewed simultaneously. Note that (i) SF did not analyse his own session and (ii) due to some of the teething problems in the laboratory, these reviews were made rather longer after the events than had been intended. However, the delay did have the effect of allowing us to approach the task afresh.

At this point, a fifth member (GA) was invited to join the project team. GA's expertise is in group dynamics and emotional intelligence; her main research involves the observation of many groups. She has, however, no formal background in PSM workshops and many of the PSMs were new to her. She had not attended any of the workshops. Thus, she brought an independent eye to the process.

Our research approach was a constant interchange between data gathering and data analysis and therefore the grounded theory methodology (Glaser and Strauss, 1967) was found to be appropriate for our study. Grounded theory is 'an inductive theory discovery methodology that allows the research to develop a theoretical account of the general features of a topic while simultaneously grounding the account in empirical observations and data' (Martin and Turner, 1986, p. 141). Orlikowski's paper (Orlikowski, 2002), which was previously published in MISQ, is a very good example of applying grounded theory. The main focus of the method is on 'developing a context-based, process-oriented description and explanation of the phenomenon, rather than an objective, static description expressed strictly in terms of causality' (Orlikowski, 2002, p. 184). It allowed us to iterate between concepts and data while comparing the findings from the decision workshops.

The video recording of the workshops produced a large set of rich observational data (ie activities and interventions in the workshops). GA analysed the observational data in a number of ways. See Appendix D for tabular summaries of her observations (Table D1–D10). Firstly, she identified a list of key issues (Table D1), objectives (Table D2), uncertainties (Table D3), stakeholders (Table D4), actions (Table D5) and techniques (Table D6) that arose in one or more of the workshops. For each of these and for each workshop, she noted whether explicit (E) or implicit (I) mention or use was made, whether it was completely missing (M) and whether the course of the workshop made it completely irrelevant (N). She then looked at the different possible phases in the processes followed in the workshops (Table D7), noting how much time was spent by each facilitator in each phase, including, of course, the possibility that a particular phase might be omitted in a workshop. Finally, she made a number of subjective comparisons of the four workshops (Tables D8–D10) on such integrative issues as the time-frame considered, facilitator style, the level of silences and impasses.

In addition to the observational data, as already mentioned, we also conducted semi-structured interviews with the facilitators. The interviews provided useful insights into facilitation practices. Because of time constraints and the lack of availability of the participants after the end of the sessions, it was not possible to conduct in-depth interviews with them. We therefore administered a questionnaire to them that contained several open-ended questions.

Thus, our data sources comprised the following:

- observations ('analysis of results' section and Appendix D),
- semi-structured interviews with the facilitators (section on 'subjective evaluation'),
- questionnaire administered to the participants (section on 'subjective evaluation')

Analysis of results

Observable activities

The first part of Appendix D illustrates the observable activities of the Workshops that were recorded during the video analysis. Table D1 presents the main issues that were discussed explicitly or implicitly (eg whether there was a problem, marketing and repackaging, the production process). On average, seven key issues were discussed in each Workshop. Five to six objectives (eg financial situation, health of customers and brand) were explicitly or implicitly identified in three Workshops, while two objectives were identified in another Workshop (Table D2). A range of uncertainties were identified, six uncertainties on average (Table D3). Stakeholders were only identified and discussed in detail in Workshop 1 (Table D4).

The actions that the participants of each Workshop devised (ranging from five to ten actions) are outlined in Table D5. The participants of Workshop 1 and Workshop 4 arrived at similar sets of actions (see Table D5). The action plan of Workshop 4 contains the same actions as the action plan of Workshop 1 plus three additional actions. There was also an overlap between the action plans devised in Workshops 2 and 3 (three out of four actions decided in Workshop 3 were also taken in Workshop 2).

In terms of main issues identified, there were similarities between Workshop 1 and Workshop 4 and between Workshop 2 and Workshop 3. Group 1 and Group 4 (Group 2 and Group 3) explicitly or implicitly identified or omitted the

Table 2 Tools used in the Decision Workshops

Workshop 1	*Workshop 2*	*Workshop 3*	*Workshop 4*
• Cognitive map • Attribute tree • Decision tree • Stakeholder plot	• Cognitive map • Timeline model • Outline of action plan	• Cognitive map • Outline of action plan • Learning tool	• Cognitive map • Influence diagram

discussion of the same set of nine out of 13 main issues (see Table D1).

Problem structuring tools

The facilitators used a range of problem structuring tools such as attribute trees, stakeholder plots, action plans, cognitive maps and decision trees to model the decision problem (see Table 2). All four facilitators drew a cognitive map. Table D6 (in Appendix D) presents the techniques (including post-its) that were used to structure the decision problem and the percentage of time that a particular technique was used. Facilitator 1 used a range of tools to structure the decision problem including a stakeholder plot that illustrated the power of the stakeholders and their influence on the decision-making process. While a decision tree was explicitly drawn in Workshop 1, a timeline model was drawn in Workshop 2 to help participants think of actions taking into account time considerations (eg actions now, tomorrow, in one week from now etc). A learning tool was used in Workshop 3 to encourage participants to reflect on the session, discuss the positive and negative aspects of the workshop, ask any questions they may have had and explore the learning outcomes of the workshop. Even though the learning tool was not used to structure the problem, it can potentially increase the confidence of the participants in the results of the decision workshop and help them commit to action. Oval post-its were used in Workshop 4 to facilitate the construction of a cognitive map.

Process patterns

One of the objectives of our work was to capture the process that facilitators follow in decision workshops. Table D7 illustrates the elements of the decision-making process (eg main issues, action plan) during the Workshops and the time spent on each decision element. Under the guidance of their facilitator, all four groups spent the same proportion of time (about 50% of their time) discussing the action plan (see also Table D8). Three out of four groups spent about 15% of the overall time discussing the main issues (group 2 of Workshop 2 spent 44% of total time). No time patterns could be found for the other parts of the decision process, that is introduction, objectives and uncertainties. Depending on the facilitator, different amounts of time were spent on these. As previously mentioned, stakeholders were only discussed in one workshop as were the roles of the actors. One facilitator encouraged participants to reflect on the action plan, while another facilitator

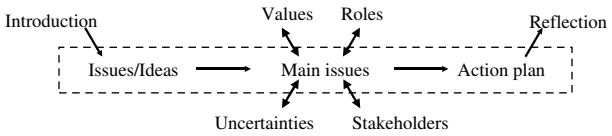

Figure 2 Process pattern.

encouraged reflection on the session. Ideas were generated using brainstorming techniques in all four Workshops and all facilitators were successful in getting the groups to reach consensus (Table D8).

After studying the steps that the facilitators followed in order to guide the group discussions, a pattern in the facilitation process emerged (see Figure 2). In all four workshops the participants, under the guidance of the facilitator, generated ideas using brainstorming techniques. They then tried to filter the information that was available to them, attach levels of importance to pieces of information and prioritize the main issues. The facilitators encouraged them to investigate different facets of the decision problem. As it can be seen from Table D7, each facilitator focused on different decision elements such as values, roles, uncertainties and stakeholders to help the participants reflect on the problem and think of actions (see Table 3). The groups would then reach consensus and agree upon an action plan.

Even though all facilitators agreed that having introductory and concluding stages was beneficial, these do not appear to be integral parts of the facilitation process. As the facilitators stated, an introductory phase could help the participants understand the role of the facilitator and the tools to be used as well assist the facilitator in managing the expectations of the participants. A concluding phase could help participants reflect on the workshop and what they learned from the process. It would also allow a facilitator to provide feedback about group dynamics as well as receive feedback about the workshop. Despite these advantages, some facilitators skipped these steps because of time pressures or because they simply forgot.

Subjective evaluation

Facilitators

As we have already discussed, following each workshop we had an evaluation feedback session to watch the recording of the facilitated meeting and discuss the workshop with the

Table 3 Main focus of workshops

	Workshop 1	*Workshop 2*	*Workshop 3*	*Workshop 4*
Main focus	Values, uncertainties and stakeholders	Main issues	Expectations, roles and learning outcomes	Introduction and reflection

Table 4 Good practice examples

Workshop 1	*Workshop 2*	*Workshop 3*	*Workshop 4*
Exploring values and the effect of actions on stakeholders	Voting approach to prioritising main issues	Reflection on learning	Introduction

facilitator. The objectives of the sessions were as follows:

- to analyse the way that facilitators had interacted with their groups and guided their discussions; and,
- to assess the usefulness of the laboratory facilities in studying group decision processes.

Watching the decision workshop was very valuable to the facilitators as it made them identify their strong points as well as their weak points. It also helped the research team observe individual and group behaviours, which were not easily identifiable during the workshop. For example, an observation was that facilitators who pause and are not afraid of several silent moments encourage the participants to contribute to the discussion, whereas trying to fill in gaps appears to have a negative impact on the flow of the discussion.

The facilitators highlighted the importance of practicing the facilitation of workshops. They noted how useful it would have been if they had an assistant to help them with the presentation of the results. As some of the participants were not native English speakers, the facilitators acknowledged the need for overcoming language barriers and appreciating other people's cultures. Drawing rich pictures and handwriting were found to be essential skills.

Even though the workshops were simulated and the participants role played, all the facilitators found the recording to be beneficial. The following facilitation tactics were found to be of particular importance:

- reviewing the group process and reflecting on the progress of the meeting;
- reflecting on the discussion and summarizing the main issues;
- ensuring that participants are committed to implementing the agreed action plan.

During our in-depth discussions with the facilitators, we identified some examples of good practice (ie aspects or parts that seemed to work well). These are outlined in Table 4.

A subjective overall impression of the workshops (by GA) is given in Table D10. It is followed by a personal critique.

Participants

In order to assess the attitudes of the participants towards the facilitators and their styles, we devised a Likert-type questionnaire. As we simulated the decision workshops, it was not possible to assess outcome measures such as benefits to the organisation (McCartt and Rohrbaugh, 1989; Rouwette *et al*, 2002) or the long-term impact of the approach to managerial decision making (McCartt and Rohrbaugh, 1995). We rather focused on workshop-related aspects such as process and facilitation measures and adapted an evaluation framework that was developed by Simpson (1998). Our evaluation criteria are outlined below:

- *Contribution to discussion* that is the extent to which the facilitator encouraged all participants to contribute to the discussion.
- *Not ignored* that is whether the participants felt ignored at times.
- *Flow of discussion* that is whether the facilitator kept the discussion going.
- *Reflection on progress* that is the extent to which the facilitators encouraged the participants to review and reflect on the progress of our discussion.
- *Breadth of material* that is whether the breadth of the material was covered.
- *Focus on main issues* that is whether the group focused on the main issues of the scenario.
- *Discussion of complex issues* that is whether the group ignored or avoided complex issues.
- *Decision model* that is whether the decision models produced were meaningful and represented the problem well.
- *Access to information* that is whether the participants felt that having access to other sources of information (eg online sources) would be useful.
- *Influence of environment* that is whether the laboratory environment affected the participants.

Figure 3 summarizes the results of our questionnaire. It shows the mean scores that the four facilitators received on a five-point Likert-type scale from 1 to 5 (1-low, 5-high).

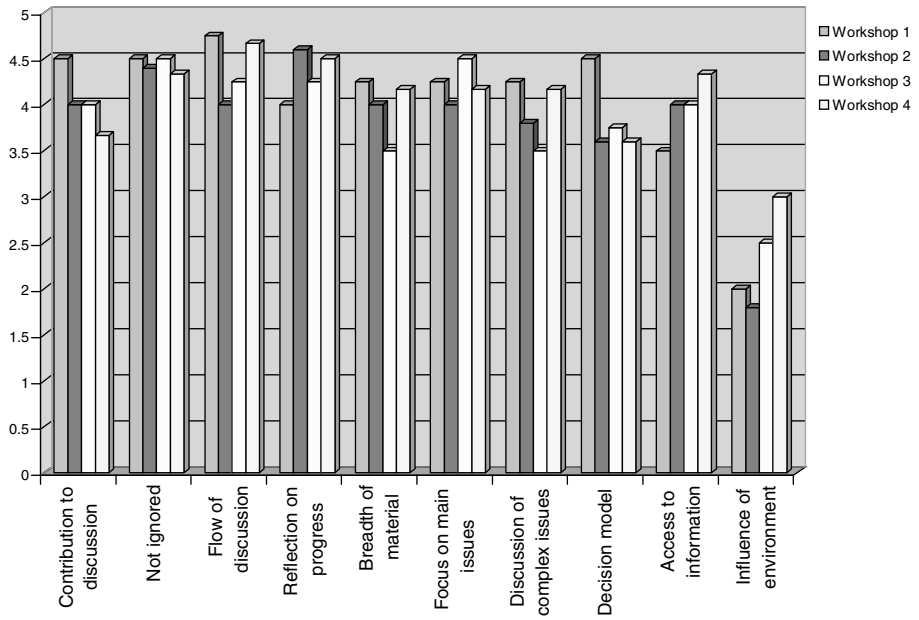

Figure 3 Evaluation feedback.

Table 5 Positive points

Workshop 1	*Workshop 3*
• It was a free discussion and very interactive. It has afforded me the opportunity to see how different people look at problems and what their priorities are. It has confirmed to me the notion that an interactive session is the best way to learn. • It was interactive and gave us the chance to express ourselves and strategize as a group. • Open table discussion where participants lead. Good enough time/length of discussion. • I liked the way the facilitator gathered and used some of the keywords the participants had used randomly to channel their thoughts.	• Yes, freely discussion and guidance, feel comfortable. • I felt confident in the group and benefited from seeing the benefits of utilizing a facilitator in this type of situation. • Finding out how the process of facilitator worked. • It's quite good to have a facilitator to help efficiently reach a decision. Enjoyable.
Workshop 2 • To see the facilitator to steering the discussion towards a solution or action plan. • It is very nice to see that we can solve a complex problem and reach consensus with people we've never met.	*Workshop 4* • Learning about the way I tackle a problem. • Interacting, social. • Seeing an experienced facilitator at work. • Interesting and impressive experience. A good chance to learn the process of problem solving and group decision making.

The participants acknowledged the benefits of taking part in facilitated workshops. Table 5 outlines the positive points that the participants of the four workshops raised.

Reflecting on the workshops, the participants raised a number of issues. These are outlined in Table 6.

Comparison of workshops and discussion of main findings

In the beginning, our research was rather open-ended. As the work progressed however, relevant categories and concepts for analysing facilitation practices emerged that drove our data collection and analysis. These are illustrated in Figure 4 and are as follows:

- *Content*: This is the content of the discussions during a workshop and include identifying key issues, objectives, uncertainties, stakeholders and actions.
- *Process*: This is the process followed during a workshop and includes the workshop timeline that illustrates the sequence of main events (eg identifying objectives, discussing

Table 6 Issues raised

- Would be nice to have comments about group dynamics as feedback,
- Challenging experience,
- Time away from work,
- Would have liked to use computer tools,
- A more accurate representation of the group profile would have been beneficial,
- The facilitator should try to get the timing. Don't let the meeting members spend too much time on a single issue.

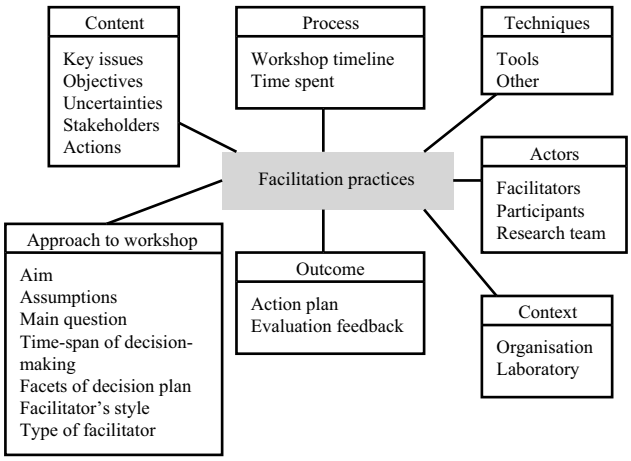

Figure 4 A conceptual framework for analysing facilitation practices.

the role of stakeholders, etc) as they unfolded and the time spent on each event.

- *Techniques*: These are the techniques applied by the facilitator in order to help the participants formulate and appraise the decision problem at hand including problem-structuring tools and other methods such as post-its and learning tools.
- *Actors*: Actors include the facilitator who guides the discussion, the participants of the workshop and the research team who observe the workshop, take notes and make observations in order to feed information back to the facilitator or for research purposes. These types of actors have also been identified in Journey Making workshops (Shaw, 2006).
- *Context*: Context is a very important element. In this study, the setting was a hypothetical organization. Laboratory facilities were used to simulate the workshops.
- *Outcome*: The outcome includes not only the action plan devised but also the evaluation feedback provided by the participants (eg overall satisfaction).
- *Approach to workshop*: This is the facilitator's overall approach to the workshop including the aim of the workshop, the assumptions made, the main question that drives the workshop, the time-span of decision making, the facets of the decision plan, the facilitator's style and the type of the facilitator.

The concepts and categories illustrated in Figure 4 are derived from our data collection and analysis rather than prior theory. Tables D1 to D9 outline our findings and support the creation of our categories. Our aim was not to propose a framework and use the literature to verify it but rather to produce new insights into the study of facilitation practices and draw a framework that other researchers can use to make comparisons between decision workshops.

It should be noted that the framework of Figure 4 evolved during our continuous comparison of the four workshops. For example, during the first two workshops we produced timelines and coded important timings. We then realized that different facilitators placed an emphasis on different activities and decided to calculate the total time spent on an activity so as to highlight the differences or potential similarities between facilitators. This is what Eisenhardt (1989) regards as 'controlled opportunism' that is taking advantage of new emergent themes to improve a theory.

The constant interplay between data collection and analysis ended when we had an adequate set of concepts and categories to interpret what we observed during the workshops. Strauss and Corbin (1998) label this as 'category saturation' that is there is no new evidence that a researcher can derive from the data to suggest a new category. Therefore, the framework we present is valid in the sense that it can be used to explain and structure the four datasets we collected from the workshops and identify patterns across decision workshops. This saturation of theory is the main way of verification in grounded theory research (Suddaby, 2006).

After identifying the main categories and concepts of our work, we can move on to discuss what was unique about each workshop and whether this had an impact on the process and outcome (see also Table 3 that presents the main focus of each workshop).

Workshop 1: Group 1 spent 8% of its time discussing about objectives (the ratio of time ranged from 1 to 5% in the other workshops). Keeney (1992) points out that decision makers who think of values and objectives are more likely to come up with better alternatives that maximize their objectives but there was no evidence in our workshops to support this (even though one could argue that the participants of Workshop 1 did not spend significantly more time on objectives compared to the participants of the other Workshops). Group 1 also spent 11% of the overall time discussing about the impact of the decision on stakeholders. Even though the discussion about objectives and stakeholders does not appear to have an effect on the action plan, Workshop 1 received very good evaluation

feedback (see Figure 3, Table D10 and personal critique in Appendix D).

Workshop 2: Group 2 spent 44% of their time discussing the main issues. However, as Figure 3 indicates, this did not have an effect on the perception of the group. One could even argue that this may have had a negative effect, because group 2 rated the criterion 'focus on main issues' lower (average score 4 (max score 5)) than the other three groups (average scores 4.25, 4.5 and 4.17), while the score on the criterion 'discussion of complex issues' was higher (average score 3.8) than that of another group (average score 3.5) but lower compared to the other two groups (average scores 4.25 and 4.17).

Workshop 3: Establishing the expectations of the participants early on in the workshop could have been a positive aspect of Workshop 3. Based on the observations of Table D10 however, this may have caused some confusion. The learning tool used at the end of the workshop could potentially increase the overall satisfaction of the participants and their commitment to action. Because the workshops were simulated, it was not possible to measure these.

Workshop 4: During our in-depth interview with Facilitator 4, we felt that it was good practice to have an introductory session in the beginning of the workshop (Table 4) to discuss about the session, process, facilitation and problem-structuring tools (Table D7). This may have had an impact on the process; Facilitator 4 spent less time on the discussion of the main issues compared to the other facilitators (see Table D7). It is not clear however, what the positive impact of an introductory session may have been.

After investigating the impact of some workshop characteristics on the process and outcome, we move on to the comparison of the decision workshops. Table 7 compares the workshops in pairs, summarizes the findings, presents any similarities or notable differences, including a comparison of the facilitators' styles and approach to the session (Table D9), and discusses the impact of these on the outcome of the workshop that is action plan (Table D5) and participants' rating of the workshop (Figure 3). Even though we discuss the ratings of the workshops on the evaluation criteria, we should stress out that the differences between the scores do not appear to be significant (the small dataset does not allow us to conduct a thorough statistical analysis).

Lessons learned

In this section, we outline lessons learned and insights from our study.

Learning: When a workshop starts, a facilitator is knowledgeable about the decision process while the participants are familiar with the content of the decision problem (Phillips and Phillips, 1993). By the end of a workshop, all parties are expected to understand both the content and process. It appears to us however, that facilitators focus on learning about content rather than process. When the workshop starts they ask a number of (what, why) questions and use a range of techniques to extract the problem from the participants. This leads to more specific questions about values and stakeholders which in turn may trigger more and better contributions. At the end of the workshop the group reaches consensus and agrees upon an action plan. The content learning process has therefore a well-defined beginning, middle and end. Reflecting, however, on the process of group decision making appears to be a more ad hoc process. For example, facilitators do not always explain the process they intend to follow nor do they give an introduction to the tools to be used and the phases of the group decision process.

Facilitator's role: Some facilitators stated that they are sometimes expected to comment on the effectiveness of action plans discussed in workshops or even come up with solutions to a given problem and provide recommendations. Therefore, it is not always straightforward what the role of a facilitator should be (eg mediator, arbitrator or trouble-shooter) or what the expectations of the workshop participants are.

Simulated workshops: One of the limitations of our study was that we did not record real-life workshops but rather we simulated facilitated meetings. As one facilitator pointed out, the main challenge in decision workshops is dealing with power structures, partnerships, conflicts and political agendas. Real decision makers are often passionate about issues and when they discuss decision problems in a group they sometimes try to influence other members in an attempt to exercise control over them. Therefore, achieving consensus may not be possible at all times. Overall though, the benefits outweighed the disadvantages. The simulation of the workshops provided rich research data which we would not have been able to collect if we had only conducted in-depth interviews with facilitators.

Use of ICT: In our study, most facilitators asked participants to note down the main issues of the problem using post-its. This ensured that all group members participated in the brainstorming phase. The post-its were then displayed on a white board. Computer systems could have been used to facilitate the visualization of the main issues and therefore stimulate 'pattern decision thinking' (Hodgson, 2004). The facilitators of our study did not use any computer tools either because of time pressures or because they preferred more traditional methods. It should be noted that the majority of soft modelling methodologies in the UK have been developed by practitioners and researchers with a management science background and can be applied without the use of computer systems (Eden, 1995). Electronic forms of contributions and decision models however, facilitates the systematic analysis and study of facilitated meetings (French *et al*, 1998; Shaw, 2003; Shaw *et al*, 2003).

Video recording: One of the advantages of collecting video data was that the research team could re-watch the videos of the workshops. This was very useful as it allowed us to evolve the protocol for structuring our observations. We were also very fortunate to have four facilitators who were prepared to act in a 'big brother environment'. In a study of this nature,

Table 7 Pairwise comparisons of workshops

	Workshop 2	*Workshop 3*	*Workshop 4*
Workshop 1	Some similarities in the set of uncertainties identified and actions taken. About the same proportion of time spent on introduction and action plan. The facilitators were different in style and their overall approach was different. Criteria such as flow of discussion and meaningfulness of decision model rated higher in Workshop 1. Better reflection on progress in Workshop 2.	No similarities between the two workshops in terms of process, approach and techniques. A few similarities in content. Different action plans taken. Workshop 1 rates higher on some criteria (eg breadth of material and discussion of complex issues), while Workshop 3 rates higher on other (reflection on progress and focus on main issues).	Very similar approach to the workshop (even though facilitator 1 contributed to the discussion where as facilitator 4 was more neutral). Similar sets of key issues and similar action plan devised. Better reflection on progress in Workshop 4. Higher scores on contribution to discussion and meaningfulness of decision model in Workshop 1.
		Similarities in terms of key issues identified. Similar set of tools (even though no post-its were used in Workshop 3).	Same set of objectives discussed (even though more time was spent in Workshop 2). Similarities in terms of uncertainties identified.
	Workshop 2	Similar approach to the workshop (Facilitator 2 and Facilitator 3 shared a common style and steered the discussions towards the same direction.). Overlap between action plans.	Overlap between action plans. Flow of discussion and complex issues rated higher in Workshop 4 whereas contribution to discussion rated higher in Workshop 2.
			A few similarities in terms of key issues and objectives discussed. Some similarities in terms of uncertainties identified.
		Workshop 3	Limited overlap between action plans. Better contribution to discussion and focus on main issues in Workshop 3. Workshop 4 received higher scores on breadth of material covered and complex issues.

however, it might be difficult to recruit professionals who agree to facilitate groups while they are being watched by their peers. The extent to which the participants of our study were affected by the environment (ie lab facilities with video cameras) was measured by the questionnaire. On a scale from 1 to 5 (1-low, 5-high), the average group responses ranged from 1.7 to 2.9 (Figure 3). A discussion of the advantages and disadvantages of video recording in decision workshops is given in Shaw (2006).

Conclusions

This paper explores facilitation practices in the use of PSMs. The work seeks to provide insights into the way facilitators use PSMs and soft OR methods to help a group of decision makers structure a complex problem in a decision workshop. Another objective is to identify examples of good practice in facilitated group meetings.

We have produced a framework for studying and assessing facilitation practices in decision workshops (see Figure 4). Facilitators or OR professionals who would like to assess their own performance and compare it against that of other facilitators can video their own decision workshop, analyse the data and then populate the facilitation practices framework for example, by estimating the time spent on key issues and outlining assumptions and main questions. In order to produce comparable results to our study, the OR professionals may choose to simulate a decision workshop and invite a small group of 5 to 7 participants (eg postgraduate students), present them with the scenario of Appendix A and ask them to role play. Assistance may be required with this task (the facilitators of our study did not have access to the scenario prior to the workshop). The professionals can then facilitate the meeting (1.5–2.5 h) produce results including action plans and compare these with the findings outlined in Tables D1 to D9. Video recording can facilitate the analysis and comparison of the results.

Running a larger number of decision workshops and creating a database of video recordings would allow us to study in more depth how the members of a group of decision makers respond to stimuli or prompts by a facilitator, communicate their thoughts and interact with one another. We could

then adopt more methodical means of analysing our data, for example, through codification and analysis of scripts that is behavioural patterns of facilitated group processes (Andersen and Richardson, 1997) or thinkLets that is collaboration processes (Briggs *et al*, 2003). Developing new methods for the systematic collection and analysis of video data would provide more 'good practice' examples and generate deeper insights.

The facilitators of our study combined PSMs and soft OR methods and therefore adopted a multimethodology approach (Mingers and Rosenhead, 2004). However, each facilitator used his/her own set of methods to structure the decision problem and followed different routes through the problem structuring space. Yet, the action plans in some workshops were found to be similar. A closer examination of the data revealed that a similar facilitation style (eg coercive, emphatic) and overall facilitation approach to a workshop (eg main assumptions and questions) may lead two comparable groups of decision makers, who are faced with the same decision problem and are given the same information, to take similar (but not necessarily identical) actions. Therefore, a facilitator's style approach may have an impact on the outcome of the workshop. Further research (ie organizing a larger number of workshops) could be used to generalize our findings and potentially identify more generic typologies of facilitators and their effect on the process and outcome of decision workshops.

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References

Ackermann F, Eden C and Brown I (2004). *The Practice of Making Strategy*. Sage: London.

Ackoff RL (1974). *Redesigning the Future: A Systems Approach to Societal Planning*. John Wiley and Sons: New York.

Adams C and Avison D (2003). Dangers inherent in the use of techniques: Identifying framing influences. *Inf Tech People* **16**: 203–234.

Andersen DF and Richardson GP (1997). Scripts for group model building. *Sys Dyn Rev* **13**: 107–129.

Bana e Costa CA, Ensslin L, Correa EC and Vansnick JC (1999). Decision support systems in action: Integrated application in a multicriteria decision aid process. *Eur J Opl Res* **113**: 315–335.

Beer S (1994). *Beyond Dispute, The Invention of Team Syntegrity*. John Wiley and Sons: Chichester.

Belton V (2006). Problem structuring for MCDA. Paper presented at 21st European Conference on Operational Research—*EURO XXI*, Iceland, 2–5 July.

Belton V, Ackermann F and Sepherd I (1997). Integrated support from problem structuring through to alternative evaluation using COPE and VISA. *J Mult Crit Dec Anal* **6**: 113–130.

Belton V and Stewart TJ (2002). *Multiple Criteria Decision Analysis: An Integrated Approach*. Kluwer Academic Press: Boston.

Bennett PG (1977). Towards a theory of hypergames. *Omega* **5**: 749–751.

Briggs RO, De Vreede GJ and Nunamaker JF (2003). Collaboration engineering with ThinkLets to pursue sustained success with group support systems. *J Mgmt Inf Sys* **19**: 31–64.

Buzan T and Buzan B (1994). *The Mind Map Book: How to Use Radiant Thinking to Maximize Your Brain's Untapped Potential*. Plume: New York.

Checkland P (2001). Soft systems methodology. In: Rosenhead J and Mingers J (eds). *Rational Analysis for a Problematic World Revisited*. John Wiley and Sons: Chichester, pp 61–89.

Courtney JF (2001). Decision making and knowledge management in inquiring organizations: Toward a new decision-making paradigm for DSS. *Dec Sup Sys* **31**: 17–38.

Daellenbach HG (1994). *Systems and Decision Making*. John Wiley and Sons: Chichester.

Eden C (1988). Cognitive mapping: A review. *Eur J Opl Res* **36**: 1–13.

Eden C (1995). On evaluating the performance of "wide-band" GDSS's. *Eur J Opl Res* **81**: 302–311.

Eden C and Ackermann F (1998). *Making Strategy: The Journey of Strategic Management*. Sage: London.

Eden C and Ackermann F (2006). Where next for problem structuring methods. *J Opl Res Soc* **57**: 766–768.

Eisenhardt KM (1989). Building theories from case study research. *Acad Mngt Rev* **14**: 532–550.

French S (1988). *Readings in Decision Analysis*. Chapman and Hall: London.

French S *et al* (1998). Problem formulation for multi-criteria decision analysis: Report of a workshop. *J Mult Crit Dec Anal* **7**: 242–262.

French S, Maule AJ and Mythen G (2005). Soft modelling in risk communication and management: Examples in handling food risk. *J Opl Res Soc* **56**: 879–888.

Friend J and Hickling A (1997). *Planning under Pressure: The Strategic Choice Approach*. Pergamon: Oxford.

Glaser BG and Strauss AL (1967). *The Discovery of Grounded Theory*. Aldine: Chicago.

Griffith TL, Fuller MA and Northcraft GB (1998). Facilitator influence in group support systems: Intended and unintended effects. *Inf Sys Res* **9**: 20–36.

Grinyer PH (2000). A cognitive approach to group strategic decision taking: A discussion of evolved practice in the light of received research results. *J Opl Res Soc* **51**: 21–35.

Hatfield AJ and Hipel KW (2002). Risk and systems theory. *Risk Anal* **22**: 1043–1057.

Hodgson T (2004). Revolutionising decision-making: The art of visual arrays. *Decision Support Series*, Metabridge. Available online at www.metabridge.com/articles/revDec.htm.

Holloway HA and White CC (2003). Question selection for multi-attribute decision-aiding. *Eur J Opl Res* **148**: 525–533.

Huxham C and Cropper S (1994). From many to one, and back—An exploration of some components of facilitation. *Omega* **22**: 1–11.

Jackson MC (1991). *Systems Methodology for the Management Sciences*. Plenum: New York.

Keeney R (1992). *Value Focused Thinking: Path to Creative Decision making*. Harvard University Press: Cambridge, MA.

Keys P (2006). On becoming expert in the use of problem structuring methods. *J Opl Res Soc* **57**: 822–829.

Lane DC (1992). Modeling as learning—A consultancy methodology for enhancing learning in management teams. *Eur J Opl Res* **59**: 64–84.

Martin PY and Turner BA (1986). Grounded theory and organizational research. *J Appl Behav Sci* **22**: 141–157.

McCartt A and Rohrbaugh J (1989). Evaluating group decision support system effectiveness: A performance study of decision conferencing. *Dec Sup Sys* **5**: 243–253.

McCartt AT and Rohrbaugh J (1995). Managerial openness to change and the introduction of Gdss—Explaining initial success and failure in decision conferencing. *Org Sci* **6**: 569–584.

Mingers J and Rosenhead J (2004). Problem structuring methods in action. *Eur J Opl Res* **152**: 530–554.

Montibeller G and Belton V (2006). Causal maps and the evaluation of decision options—A review. *J Opl Res Soc* **57**: 779–791.

Ngwenyama OK, Bryson N and Mobolurin A (1996). Supporting facilitation in group support systems: Techniques for analyzing consensus relevant data. *Dec Sup Sys* **16**: 155–168.

Niederman F, Beise CM and Beranek PM (1996). Issues and concerns about computer-supported meetings: The facilitator's perspective. *MIS Quart* **20**: 1–22.

Orlikowski WJ (2002). CASE tools as organizational change: Investigating incremental and radical changes in systems development. In: Myers MD and Avison DE (eds). *Qualitative Research in Information Systems: A Reader*, Chapter 11. Sage Publications: London, pp 181–221.

Phillips LD and Phillips MC (1993). Facilitated work groups—Theory and practice. *J Opl Res Soc* **44**: 533–549.

Pidd M (1996). *Tools for Thinking: Modelling in Management Science*. John Wiley and Sons: Chichester.

Pidd M (ed) (2004). *Systems Modelling: Theory and Practice*. John Wiley and Sons: Chichester.

Rosenhead J (1980a). Planning under uncertainty I: The inflexibility of methodologies. *J Opl Res Soc* **31**: 209–216.

Rosenhead J (1980b). Planning under uncertainty II: A methodology for robustness analysis. *J Opl Res Soc* **31**: 331–341.

Rosenhead J and Mingers J (eds) (2001). *Rational Analysis for a Problematic World Revisited*. John Wiley and Sons: Chichester.

Rouwette EAJA, Vennix JAM and van Mullekom T (2002). Group model building effectiveness: A review of assessment studies. *Sys Dyn Rev* **18**: 5–45.

Schuman SP (1996). What to look for in a group facilitator. *Qual Prog* **29**: 69–72.

Shaw D (2003). Evaluating electronic workshops through analysing the 'brainstormed' ideas. *J Opl Res Soc* **54**: 692–705.

Shaw D (2006). Journey making group workshops as a research tool. *J Opl Res Soc* **57**: 830–841.

Shaw D, Ackermann F and Eden C (2003). Approaches to sharing knowledge in group problem structuring. *J Opl Res Soc* **54**: 936–948.

Shaw D, Franco A and Westcombe M (2006). Editorial—Problem structuring methods: New directions in a problematic world. *J Opl Res Soc* **57**: 757–758.

Shaw D, Westcombe M, Hodgkin J and Montibeller G (2004). Problem structuring methods for large group interventions. *J Opl Res Soc* **55**: 453–463.

Simpson L (1998). *Supporting Decision Analysis: A Pragmatic Approach*. School of Computer Studies: Leeds, University of Leeds.

Strauss AL and Corbin JM (1998). *Basics of Qualitative Research: Techniques and Procedures for Developing Grounded Theory*. Sage Publications: London.

Suddaby R (2006). From the editors: What grounded theory is not. *Acad Mngt J* **49**: 633–642.

ten Have S, ten Have W, Stevens F and van der Elst M (2003). *Key Management Models*. FT Prentice Hall: London.

von Winterfeldt D and Edwards W (1986). *Decision Analysis and Behavioral Research*. Cambridge University Press: Cambridge.

Warboys BC, Kawalek P, Robertson I and Greenwood RM (1999). *Business Information Systems: A Process Approach*. McGraw-Hill: London.

Wong Z and Aiken M (2003). Automated facilitation of electronic meetings. *Inf & Mnmt* **41**: 125–134.

Appendix A: The fictitious scenario

Cleonor is a leading European cosmetics company specializing in skincare and fragrance products that combine natural ingredients with advanced formulas. It is a French-based company with an emphasis on research and innovation. The company's philosophy focuses on developing sophisticated products at an affordable price.

With a 7.2% market share, *Cleonor* is the fifth leading company in the European cosmetics industry. In 2002, the industry generated 60 billion in revenue, a 2% increase. Despite a recent rise in sales, *Cleonor* saw profits drop 5% in the last two quarters mainly due to an unsuccessful promotional campaign to launch a new series of hair care products.

One of the best selling *Cleonor* products is *Cleonite*, a night repair cream in an attractive new package that stimulates cellular activity and invigorates the skin. One of the main ingredients of *Cleonite* is *Tocopherol* (TOC), a powerful antioxidant that eliminates dead cells and free radicals and improves the skin's complexion. The cream also contains essential oils and plant extracts that moisturize the skin in depth and strengthen its elasticity. After several applications, thin lines and wrinkles are diminished and the skin feels nourished and relaxed. *Cleonor* claims that Cleonite slows down the ageing process by stimulating the skin's own self-repair mechanisms.

A research intelligence team has been recently set up to gather information about new ingredients, products and competitors. They use a range of sources including published research and the Web. This is part of an attempt to streamline the company's R & D operations after a series of disastrous projects. A recent example is the management's decision to fund research on the effect of Yuzu plant extracts on cell vitality, only to find out towards the end of the project that the results of a similar study were in the public domain.

The research intelligence team routinely collates data and sends reports to all interested parties. The latest report discusses the research findings of a small group of scientists based at the University of Doulon, a small university with good reputation approximately 50 km outside of Paris. They claim that under certain conditions such as high temperatures, *copolyester* AN01 found in plastic containers can contaminate products with TOC. It appears that an interaction between copolyester AN01 and TOC releases *phe-acid*, a chemical substance that is suspected to cause skin cancer. The research group has posted a report on the University's Web site as part of their departmental research working paper series. The report outlines a number of findings but does not give any details about the group's research methodology and experiments. This raises questions over the validity of the research undertaken.

Having read the latest intelligence report, Jean-Paul Pesquex the director of package development is clearly disappointed. When he joined *Cleonor*, *polypropylene* TP was

used for all packaging which made containers look opaque and rather unattractive. He worked closely with *Plast Labs*, a pioneering packaging lab based in Switzerland, to develop a new container for *Cleonite*. Plast Labs decided to use copolyester AN01 instead of polypropylene TP to produce clear containers and prolong the shelf life of the product. The new containers were transparent and stronger. *Cleonor* launched an advertisement campaign with the slogan 'A clear radiant shield' to promote *Cleonite*. The campaign was so successful that it was decided to use the same packaging material for the new lipstick series 'Pure Gloss'.

As Yvon Pascal, the product PR manager, reads the latest intelligence report, her telephone rings. The call is from a journalist, who claims that he is impressed by the slogan 'A clear radiant shield' and wishes to know more about the ingredients of *Cleonite*, in particular TOC. There is no mention of the Doulon University research paper and its findings during the telephone conversation. However, Yvon wonders if the journalist knows something about the research paper.

How would you formulate the issues for the *Cleonor* management team?

Appendix B: Summary

The Cleonor Scenario

Cleonor is a leading European cosmetics company specialising in skincare and fragrance products. One of the best selling *Cleonor* products is *Cleonite*, a night repair cream. *Cleonite* contains an antioxidant called *Tocopherol* (TOC). TOC is suspected to interact with *copolyester* AN01 found in Cleonite plastic containers and produce *phe-acid*, which is a carcinogenic substance. The possibility of such an interaction is highlighted in a report produced by a team of scientists based at the *University of Doulon*. It should be noted that *Cleonite* containers were previously made of *polypropylene* TP but *Plast Labs* (a packaging lab) decided to use copolyester AN01 instead.

Appendix C: Observation report

Workshop: .....
Observer: .....
Date(s) tape watched: .....

Time on Tape	Activity including who is acting	Comment/Interpretation/ Question raised

Appendix D: Observations by GA

Observable activities (issues, objectives, uncertainties, stakeholders, actions identified)

Tables D1–D7.

Subjective observations and comparisons

Tables D8–D10.

Final impression from all four sessions (GA's personal critique):

The process and dynamics of each session result from the interplay between facilitator and participants. It is not an issue of personality, but rather an issue of assumptions, knowledge, and session goals made explicitly by the facilitator and different understandings of the case made by different participants.

To me, the best Workshop was the session conducted by Facilitator_1, because not only was Facilitator_1 able to challenge the participants, structure the session and allow for a better flow of discussion, but also because participants were able to challenge themselves and look for broader perspectives.

A negative aspect was that, in general, facilitators forgot to bring people to the discussion if some of the participants dominated it.

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Table D1 Key issues

Key issues	*Facilitator_1*				*Facilitator_2*				*Facilitator_3*				*Facilitator_4*			
	E	*I*	*M*	*N*	*E*	*I*	*M*	*N*	*E*	*I*	*M*	*N*	*E*	*I*	*M*	*N*
General process issues																
Is there a problem? (questioning the potential seriousness of damage to health)		x					x			x			x			
How would Cleonor deal with the crisis?			x		x						x					x
Where is the problem?	x						x				x			x		
What would be the decision?				x		x			x							x

Table D1 Continued.

Key issues	*Facilitator_1*				*Facilitator_2*				*Facilitator_3*				*Facilitator_4*			
	E	*I*	*M*	*N*	*E*	*I*	*M*	*N*	*E*	*I*	*M*	*N*	*E*	*I*	*M*	*N*
Specific content issues																
The responsibility to the customers (relationship with the public)		x				x				x				x		
Relationship with the journalists /media	x				x				x						x	
Communication effectiveness between package and production			x		x				x						x	
Marketing and repackaging			x		x				x						x	
Impact of a potential problem	x							x	x				x			
Reputation			x			x			x				x			
Production process				x				x			x		x			
Long-term research/ collaboration	x						x				x		x			
Competitors			x				x				x		x			

E—explicitly identified in the workshop;
I—implicitly identified in the workshop;
M—missing from the workshop;
N—not an issue in the workshop; their discussions/assumptions made it irrelevant.

Table D2 Objectives

	Facilitator_1				*Facilitator_2*				*Facilitator_3*				*Facilitator_4*			
Objectives	*E*	*I*	*M*	*N*	*E*	*I*	*M*	*N*	*E*	*I*	*M*	*N*	*E*	*I*	*M*	*N*
Financial situation (eg share price, market share, profit, lost revenues)	x				x				x					x		
Reputation/prestige (associated with health safety)			x		x						x			x		
Public relations			x		x						x			x		
Health of customers	x					x				x				x		
Brand	x						x				x				x	
The concern of the customers	x				x						x			x		
Trust in the company	x						x				x				x	
Corporate social responsibility	x						x				x				x	

Table D3 Uncertainties

	Facilitator_1				*Facilitator_2*				*Facilitator_3*				*Facilitator_4*			
Uncertainties	*E*	*I*	*M*	*N*	*E*	*I*	*M*	*N*	*E*	*I*	*M*	*N*	*E*	*I*	*M*	*N*
Production process involves high or low temperature			x				x				x		x			
Interaction between product and package ingredients, apart from considerations of the production process		x					x				x		x			
Scientific validity of the research done by the university		x				x					x		x			

Table D3 Continued

	Facilitator_1				*Facilitator_2*				*Facilitator_3*				*Facilitator_4*			
Uncertainties	*E*	*I*	*M*	*N*	*E*	*I*	*M*	*N*	*E*	*I*	*M*	*N*	*E*	*I*	*M*	*N*
Motivation for the research (eg have competitors funded the research?)			x				x		x				x			
Journalist (eg is there a press campaign against the company?)			x		x				x				x			
Competitors (are they doing something?)			x				x			x			x			
If it is a false alarm, will people return to buy the problematic product?	x				x						x				x	
The risk of taking actions (eg what will the media/public do if the company changed the packaging?)	x				x						x		x			
Consequences of causing skin cancer	x					x				x			x			
The risk of Cleonor actions (eg what would Plast Labs, distributors, and retailers do if the company changed the package?)	x						x				x				x	

Table D4 Stakeholders

	Facilitator_1				*Facilitator_2*				*Facilitator_3*				*Facilitator_4*			
Stakeholders	*E*	*I*	*M*	*N*	*E*	*I*	*M*	*N*	*E*	*I*	*M*	*N*	*E*	*I*	*M*	*N*
Customers	x						x				x				x	
Cleonor	x						x				x				x	
University of Doulon	x						x				x				x	
Journalists	x						x				x				x	
Plast Labs	x						x				x				x	
Research intelligence team	x						x				x				x	
Stakeholders	x						x				x				x	
Regulators	x						x				x				x	

Table D5 Actions

	*Facilitator_1**				*Facilitator_2*				*Facilitator_3*				*Facilitator_4**			
Actions	*E*	*I*	*M*	*N*	*E*	*I*	*M*	*N*	*E*	*I*	*M*	*N*	*E*	*I*	*M*	*N*
Distinguish between short term and long term actions		x			x						x		x			
Do nothing (potential reactive action)	x						x				x		x			
Investigate (eg contact the university and gather more information from them)	x				x				x				x			
Investigate first and then collaborate (eg contact the university/ Plast Labs and gather more information from them and later collaborate with them)	x						x				x		x			
Do our own research			x				x		x*				x			
Repackage first and then investigate	x				x						x		x			
Withdraw the product from the market			x		x						x		x			
Investigate/rethink the production process			x				x				x		x			

Table D5 Continued

Actions	*Facilitator_1*[*]				*Facilitator_2*				*Facilitator_3*				*Facilitator_4*[*]			
	E	*I*	*M*	*N*	*E*	*I*	*M*	*N*	*E*	*I*	*M*	*N*	*E*	*I*	*M*	*N*
Talk with the journalists/ media			x		x				x						x	
Press conference to inform consumers			x		x						x				x	
Analysis of cost and benefits of actions			x		x						x				x	
Identify the speaker to the talks			x		x						x				x	
Draw a chronogram of actions			x		x						x				x	
Marketing campaign		x			x				x				x			
Allocate people to actions			x				x		x						x	

[*]Only potential actions.

Table D6 Problem structuring techniques

	Facilitator_1		*Facilitator_2*		*Facilitator_3*		*Facilitator_4*	
Techniques[*]	*Used*	*%*	*Used*	*%*	*Used*	*%*	*Used*	*%*
Post-its	x	25	x	30			x	25
Attribute tree	x	5						
Influence diagram							x	35
Cognitive map	x	5	x	15	x	20	x	40
Text notes	x	20	x	55	x	80		
Decision tree	x	30						
Stakeholder plot	x	15						

[*]Note that we give a subjective estimation of the proportion of time spent in using the techniques.

Table D7 Process

Process phase	*Facilitator_1* *Time*	*Facilitator_2* *Time*	*Facilitator_3* *Time*	*Facilitator_4* *Time*
Introduction	3	2	9	19
Session				9
Process				4
Facilitation				2
Tools				4
Objectives of the session			9	
Roles			11	
Main issues	17	48	18	13
Discussion/Reflection	17	15	18	4
Categorization		20		9
Voting process		11		
Summary of voting process		2		
Stakeholders	13			
Action plan	58	52	45	54
Discussion	27	28	33	37
Time frame		10		
Strategy	28			17
Assign people to actions			9	
Summary	3	14	3	
Objectives	9	6	1	2
Uncertainties	12		5	8
Reflection on the action plan				7
Reflection on the session			5	
Total time[*]	112	108	94	103

[*]The total time calculated in mins may be slightly shorter than the duration of the actual workshops since impasses and non-productive times were not taken into account.

Table D8 Similarities between workshops

Similarities	*Facilitator_1*	*Facilitator_2*	*Facilitator_3*	*Facilitator_4*
Time given to action plan	52%	48%	48%	52%
Generation of ideas	Brainstorming	Brainstorming	Brainstorming	Brainstorming
Conformity of agreement	No relevant discordances, easy to get consensus in the action plan	No relevant discordances, easy to get consensus in the action plan	No relevant discordances, easy to get consensus in the action plan	No relevant discordances, easy to get consensus in the action plan

Table D9 Differences between workshops

Differences	*Facilitator_1*	*Facilitator_2*	*Facilitator_3*	*Facilitator_4*
Assumptions	A potential problem (eg do nothing is an option)	A real problem	A real problem	A potential problem (eg do nothing is an option)
Aim of the session	To think about various scenarios, issues of concern and questions as they arise	To make a decision	To make a decision	To think very broadly about what the possible options are and come back to explore them further at a later stage
Main question driving the Workshop	What is the problem?	How would Cleonor deal with the crisis?	What would be the decision?	Is there a problem?
Time frame of a potential strategy	Short and long-term	Short-term	Short-term	Short and long-term
Facets of the decision plan	Multiple perspectives	A more monochord discourse	A more monochord discourse	Multiple perspectives
Facilitator style	Coercive and empathic	Negotiationable	Coercive	Empathic
Degree of comfortableness	High	Moderate	Moderate	High
Level of impasses/ silences	Low	Moderate	High	Low
Type of facilitator	Challenge the participants, by questioning them, by interpreting or summarizing what the participants say using different words	Follow the participants and rarely question or challenge them	Follow the participants and rarely question or challenge them	Challenge the participants, by questioning them, by interpreting or summarizing what the participants say using different words

Table D10 Overall impression (GA's personal statement)

Facilitator_1	Facilitator_1 had a clear/structured picture about what the session should look like (eg the use of different techniques at different moments helped to introduce and visualise different perspectives, which resulted in several well defined scenarios.)
	Facilitator_1 brought a lot of himself to the session.
Facilitator_2	Facilitator_2 often asked participants to rephrase what should be written on the whiteboard.
	Facilitator_2 followed, in part, the dynamics introduced by the participants and rarely questioned what they were saying.
Facilitator_3	It seems that Facilitator_3 introduced the session by beginning to inquire about something that should have been discussed at the end of the workshop and the participants were quite lost. (eg during the session, participants asked Facilitator_3 what his role was and what was expected from the session)

Table D10 Continued

	Facilitator_3 had some difficulties in dealing with silences and was not able to bring all the participants to the discussion.
Facilitator_4	Facilitator_4 created a very empathic environment at an early stage of the session. Facilitator_4 made clear that nothing would be expected from the session and that the most important thing would be to make sense of the problem (if there was a problem in the first place).
	Facilitator_4 came with the assumption that participants would question whether or not there was a problem. The participants responded in a very positive way to such a claim.