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Problem Structuring without workshops? Experiences with distributed interaction within a PSM process

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Abstract

PSMs have been widely and successfully used in many organisations, but the reliance on face-to-face meetings and workshops makes a typical PSM project difficult and time-consuming to organise, and means that the process may only involve a narrow cross-section of the organisation. Yet much interaction in organisations is neither face-to-face nor even synchronous. This research seeks to 1) explore how the issues which arise in moderating such distributed interaction differ from the issues involved in facilitating a workshop; and 2) identify the circumstances under which it makes sense to consider using the distributed mode of interaction within a PSM process. Three pairs of action research case studies using a distributed variant on the SODA process are described, together with our answers to the above questions.

Introduction

In contrast to traditional methods of OR analysis, Problem Structuring Methods (PSMs) and related methodologies such as Decision Conferencing focus on helping organisational actors arrive at a shared understanding and way forward on some issue of concern. Such methodologies have been widely and successfully used in organisations (Rosenhead and Mingers, 2001).

A characteristic of PSMs is their extensive use of workshops, where participants will create a model "on-the-fly". Because of this reliance on workshops, while delivering significant value to the organisation overall, PSMs can be very costly in terms of participant time, as well as in financial terms if the organisation is not physically collocated. Moreover, because involvement is restricted to

workshop participants, what is often a key goal of PSMs – to involve a broad constituency of opinion in organisational and policy decision making – may be compromised.

However, over the last fifteen years or so patterns of organisational communication have been transformed by the arrival of e-mail and the Internet, which allow remote, asynchronous interaction. A question which naturally arises is how it might be possible to use such technologies to reduce the overall cost and broaden the catchment of a PSM intervention.

This paper reports a series of exploratory studies which sought to explore to what extent such distributed interaction can play a role in a PSM process. The key research questions were 1) to explore how the issues which arise in moderating such distributed interaction differ from the issues involved in facilitating a workshop; and 2) to identify the circumstances under which it makes sense to consider using the distributed mode of interaction within a PSM process.

We use "distributed" to mean "distributed in space and asynchronous". Of course, it is possible to imagine a PSM process which makes use of interaction amongst members of a group which is distributed in space but not in time (e.g. by videoconferencing) and indeed, there is a relevant related literature (e.g. Mittleman *et al*., 1999) but this mode of interaction was not the focus or attention in these studies and we do not discuss this literature or the implications that this may have for PSMs here.

Literature Review and contribution

The traditional focus of PSM research has been on supporting interacting groups in collocated settings. However, Ackermann (1996a) has suggested that providing some sort of problem structuring support to geographically distributed groups might be a new frontier for PSM research. Friend and Hickling (1997), ever-sensitive to the overwhelming demands for participation in policy problems, suggest exploring "remote conferencing methods" (p. 332) and "experiments in distributed meetings" (p. 333) as a means to facilitating greater involvement.

By and large such calls have gone unheeded in the PSM community. While it is true that some PSM applications do partially incorporate a distributed component (Vennix, 1996, and Best *et al*., 1986, use

a Delphi-like process in their System Dynamics and Robustness Analysis modelling respectively), this paper is, to the best of our knowledge, the first to describe research undertaken specifically with a view to exploring the implications of using this mode within a PSM process.

There is some relevant literature outside the PSM literature itself. One relatively developed approach to providing decision support to distributed groups is to be found within the Group Support Systems (GSS) tradition. This community consists of a cluster of researchers located within the Information Systems discipline, whose research focuses on the development of IT systems to support group work, particularly, decision-related tasks. There are a number of similarities and differences between this tradition and the PSM tradition which we have reviewed elsewhere (Morton *et al.*, 2003).

Within the GSS tradition, there has been considerable interest in the distributed work. Nunamaker (1997) suggests that "how to work in a distributed mode" (p. 365) is likely to be one of the "major issues" for GSS research in the future. A number of papers (e.g. Dennis *et al.*, 1997; Romano *et al*., 1998) document GSS' intended to support distributed interaction. There is also a small body of experimental research studying the contribution of this technology to the improvement of group process (see Fjermestad, 2004, for a recent review). A small number of field studies have also been conducted (e.g. Qureshi *et al*., 1999; Arkenstein *et al*., 2004).

By far the most sustained contribution to research on distributed GSS has been the research of a cluster of scholars at the New Jersey Institute of Technology, centred on Starr Roxanne Hiltz and Murray Turoff. Over almost three decades, since the very beginning of research on the use of IT to support decision making groups, these researchers have been involved in a range of research activities, encompassing system development, and experimental and field work (Hiltz and Turoff, 1992; Hiltz *et al*., 2001). A particular theme of this research has been the claim that technology should be seen as "a context for interaction, 'containers', so to speak, just as rooms are. This conception is based on a social theory that human systems are self-organizing and arise out of the unrestricted interaction of autonomous individuals." (Hiltz *et al*., 2001).

Another stream of research which has some relevance to the present discussion is research on the Delphi method, and in particular, "Policy Delphi" (Turoff, 1975). The Delphi method refers to a process where group interaction is structured as a process of iterated questionnaires, where the aggregated results of the *i*th round questionnaire is presented back to respondents in the *i+1*th round. Whereas traditional Delphi is intended as a tool for judgemental forecasting, Policy Delphi refers to an application of the Delphi process where the motivating problem is a decision problem, rather than simply a question of assessment.

The key book on the Delphi method was Helmer (1966), and since then a huge number of Delphi applications have been carried out (see Gupta and Clarke, 1996, for a relatively recent bibliography). The primary resource on how to conduct a Delphi study probably remains Delbecq *et al*. (1975). The seminal paper on Policy Delphi (Turoff, 1975) was written by the same Murray Turoff as was alluded to in connection with the New Jersey research, and since then, a handful of Policy Delphi exercises have been carried out (see Needham and de Loe, 1990, for a review).

Both the Policy Delphi and GSS literatures are extremely heterogeneous in character, reflecting a range of research interests and programs, ranging from practically minded "how to do it" guides to theoretical studies concerned with questions arising in the social scientific study of computer mediated communication. While we have endeavoured to give a flavour of the character of these literatures, we do not believe that there is a set of "key messages" or "key lessons" which emerge from these bodies of work as a whole (although, of course, individual studies are written with some particular point in mind). Rather than attempt to derive such a set of key messages, we conclude this section by contrasting these research traditions, at a high level, with the PSM research tradition. We will refer to relevant points from these literatures in the discussion of our first research question.

The objectives of the Policy Delphi and distributed GSS research traditions – to provide a mechanism by which distributed groups can move towards a decision – are, broadly speaking, the same as those of the proponents of PSMs, and so their experiences are an important source of information for us on what works and does not work in this environment. At the same time, the approaches which the proponents of these research programs take could hardly be said to be similar in spirit to PSMs. This is partly

because neither the Policy Delphi nor the distributed GSS programs use the sort of qualitative modelling techniques which are the bread and butter of a PSM intervention. But another, perhaps deeper reason is that there is, we would contest, a distinctively PSM view of the decision making process which focuses on organisational decision making as the negotiation of interpretive frames, as described in Eden (1989).

> We are accustomed to Machiavellian views of power and politics where careerism, ambition, and sheer bloody-mindedness are the focus of attention. The manoeuvring of people along Machiavellian dimensions is relatively easy to identify, but it, in my experience, much less common than the politics that result from the wish to define reality. This latter form of politics is the essence of human life [p. 47]

Similar statements can be found in other PSM writers (e.g. Bryant, 1989, p. 95 and Checkland, 1989, p.83). Yet there is no sense in which this view of the decision process is reflected in either the Policy Delphi or GSS literatures.

Research Methodology

In order to answer the questions raised above, and in the light of the limitations of the reviewed literature, a series of three pairs of action research (Eden and Huxham, 1996) case studies were undertaken, comprising six studies in all. The pairs were conducted in sequence and so it was possible to digest the lessons from each pair before proceeding. In all cases, there was a real and substantive issue, and a group of stakeholders who had some particular reason for attending to the issue. The problem-owner in all cases wanted to solicit and take account of the views of the stakeholders in some decision process.

The intervention methodology can be broadly thought of as a distributed variant of the SODA process (Eden and Ackermann, 2001a, 2001b), in that the key idea was to build up a group map (captured in the software Decision Explorer) of the problem area, but relying largely or exclusively on asynchronous communication. In each exercise, the process was structured as two or three "rounds". In each round, concepts (nodes) of a map were elicited, structure was validated, or the map was elaborated and developed using questionnaires (in this sense, the process was "Delphi-like"). In two out of the six cases, one of the rounds was a meeting round: the other round was an asynchronous round. In one of the cases, the asynchronous communication was mediated by a networked Decision Explorer model, whereas in all other cases, communication took place through e- or physical mail.

In a typical questionnaire round, participants would typically receive a booklet of views from the emerging map, accompanied by questions which sought to either develop the concepts in the map or arrive at some preliminary prioritisation of the map concepts. These booklets would contain between 6 and 10 pages, with roughly two questions per page. In contrast to a traditional questionnaire, questions were organised around, and required the reader to familiarise himself with the view of the map on the same or facing page. A page from such a questionnaire is exhibited as Figure 1.

Figure 1 about here

The three pairs of cases were:

1. DRW. These two exercises were intended to aid in the planning of an annual two-day doctoral research workshop for a university Department. The participants in the two exercises in the study were the full-time and part-time research students in the Department respectively. The client was the Department's Director of Research and the outcome was a report which fed into a plan for the workshop.

2. RMC. These two exercises were intended to inform a review of the Research Methodology Course for a university faculty. The participants in the two cases were the teaching staff of one Department, and the research students across the whole faculty respectively. There were two clients: the Head of Department was the client for the exercise with the teaching staff and the Vice-Dean Research was client for the exercise with the research students. The outcomes were two reports, one for the Head of Department (which fed into the Departmental submission to the review process) and one for the Vice-Dean Research (who was in overall charge of the review).

3. PTT. These two exercises were conducted for a policy thinktank which intended to set up discussion groups on various government policy issues, and wished to map out the diversity of views with respect to educational and economic policy respectively. The client for both cases was the Director of Research at the thinktank. The outcome in one case was a report to the client, in another case, the map fed directly into an initial statement for the policy network.

A detailed picture of the characteristics of the various cases is shown in Table 1.

Table 1 about here

In order to capture the issues which arose out of the process, interviews and questionnaires were conducted. The design of the interview schedule and questionnaires and subsequent data analysis was

guided by the conceptual framework discussed in the next section, which evolved over the course of the studies. Overall, forty-three interviews were conducted, and short process-related questionnaires were incorporated in the second and third rounds of the cases to gauge participants' reactions to the process. The issues which were tracked in the process questionnaires and interviews were: ease of finding time; ease of processing information in map form; and views on relevancy, opportunities for learning and worthwhileness of participating in the process.

Interview data was tape-recorded, transcribed and coded and Decision Explorer was used to structure the coding concepts and keep track of interrelationships. Analysis was done at the conclusion of each pair of case studies, and for the first two pairs of studies, a research report was written. At the conclusion of the research, much of the data was re-coded and in order to facilitate comparison across different cases, a "Case-Ordered Descriptive Meta-matrix" (Miles and Hubermman, 1994) was drawn up with the cases along one axis and the key cross-case themes along the other, and this matrix was populated with relevant data and observations from each case. A detailed report on this analysis and the findings thereof is available in Morton (1999). What follows is a summary of what seemed to be the most significant issues across all cases, and a comparison back to the treatment of these issues in the GSS and Policy Delphi literatures.

Research Question 1: distributed interaction versus workshops

In order to address the first research aim (of identifying the key issues in moderating distributed, as opposed to workshop-based interaction) in a structured way, we used a framework inspired by the facilitation frameworks of Bostrom *et al.*(1993) and Ackermann (1996b). The Bostron and Ackermann frameworks identify the key actions of the facilitator before, during and after a facilitated meeting.

Our purpose was to use this before-during-after structure to provide a structure for organising and discussing the activities which were found to be necessary in the distributed environment. We did not seek to provide a point-by-point comparison of whether the tasks specified by Bostrom *et al.* and Ackermann as appropriate to facilitation in the face-to-face environment were also tasks which we found ourselves performing in the distributed environment. In many cases, it seemed clear from the

definition of the activity that it would have no analogue in the distributed environment (consider e.g. Ackermann's point 2.7 "enabling the group to concentrate on the task being addressed").

In the context of the framework we used for studying the interventions described here, we call the corresponding phases setting up the exercise, moderating the exercise, and monitoring the outcomes of the exercise. We refer to the activity of directing a distributed session as "moderation" to underscore that this is a very different activity from workshop facilitation. We structure our discussion around key considerations in each of these phases. The mature version of the framework, which we used for the final cross-case analysis, is shown in Table 2. We use this framework to identify the issues which arose from the cases, focussing particularly on issues which differentiate moderating distributed interaction from traditional workshop-based interaction and to relate these back to the experiences of the Policy Delphi and distributed GSS researchers.

Table 2 about here

Setting up the exercise

Motivating participants

A central issue apparent in all cases was the importance of motivating participation. The cases which had the poorest levels of participation (measured by failure to return questionnaires) were those where there were few incentives for participants to be interested (for example, research students were less keen to devote energy to participating in a review of a course which had already taken place, and which they would not be required to attend in the future).

The importance of motivating participation is discussed in the Delphi literature: thus Delbecq *et al*. (1975) talk about the importance of participants "feeling personally involved" (p. 87) and Rotondi and Gustafson (1996) stress the need for a "tension for change" (p.39). Techniques for achieving this including framing the objective of the exercise to make it directly relevant, establishing personal relationships with potential participants (by visit or phone call), and stressing the embeddedness of the PSM process in a broader decision process which is demonstrably supported by the organisation.

In a collocated environment, motivation is of course important, as poorly motivated participants may stay away, or "tune out" whilst still present. However, there is a sense in which a workshop group is captive, in that there are social pressures to remain attentive, the activity of the workshop is often relatively engaging, and there is not the barrage of alternative claims on attention which face the participant in a distributed session. For these reasons, it is plausible to suppose it to be *ceteris paribus* harder to motivate people to participate in a distributed as opposed to a collocated process. There is anecdotal evidence for this: for example, despite a long record of work on collocated GSS, Nunamaker (1997) says that "a severe problem that all distributed sessions have encountered has been the difficulty of getting members to contribute and then maintain their engagement over time" (p. 377).

Designing the exercise

In designing a distributed session, attention has to be given to the choice of the modelling technique, and to how the model will be presented to the participants. A particular constraint is that the modelling technique has to be sufficiently transparent or familiar that participants can "read" the model without real-time coaching. While this was the case for many participants in our cases, some people had difficulty relating to information presented in map form. We feel there is scope for further exploration of this issue. There is existing experimental research which suggests that even very simple structuring tools, such as listing and voting tools ameliorate the perception of the distributed mode of communication as an inexpressive and restrictive medium (Dufner *et al*., 1995) and some Delphi researchers report positive experiences with graphical visualisation techniques (Scheele, 1975).

A second dimension of design which is worth drawing attention to in a distributed session is the choice of co-ordination structure. Kim *et al*. (2002) differentiate between a more restrictive sequential co-ordination mode, which is "a step-by-step procedure that leaves no freedom to deviate from a system-defined linear interaction procedure, and interaction is reactive to what is required by this procedure" (this being the mode of the traditional Delphi process) and a less restrictive "parallel" co-ordination mode where "individuals and groups… move back and forth among sub-tasks at the same time in parallel" (p. 385) in a more self-organising fashion.

Most of the studies described above (the exception being the experiment with the networked Decision Explorer model) were sequential mode processes. Technological limitations severely constrained the space of possible choices here: to support a parallel process well would require a carefully designed information system which provided both a facility for interaction with a model and a conferencing facility to allow users to discuss modelling and process issues (what Robinson, 1991, calls a "second-level" conversation).

The key finding of the experiments described in Kim *et al*.(2002) is that the parallel, less restrictive co-ordination mode is more appropriate as it allows participants to tailor the process to their own preferred workstyles. Clearly this would be an interesting direction for future research in this area.

Establishing a relationship with the client

A vitally important aspect of any PSM intervention is establishing a working relationship with the client (Ackermann, 1996). The client may have a number of reasonable worries about any PSM process, and different levels of client control over the process are possible. For example, in some cases, the moderator communicated directly with the participants and reported to the client post hoc, whereas in others, all communications from the moderator went through and were vetted by the client. The parallel issue in a traditional PSM process is whether the client attends the workshop (and so implicitly reserves the right to intervene if necessary).

We see questions relating to client involvement in a PSM process, as being essentially the same whether the process is distributed or face-to-face. On one side, direct involvement of the client (who is often relatively senior in the organisation) may inhibit participants' ability to contribute frankly to the process. This has to be set against the increased profile of the process in the organisation arising from the visibility of the client's sponsorship, and the greater level of direct control over the process which the client obtains, allowing them to channel discussion in ways which are they perceive are directly relevant to the purposes of the organisation. We do not think that there is a universally correct level of involvement which a client should have in a PSM process, but that this should depend on the tradeoffs which are most acceptable to those in the organisation in which the intervention is taking place.

This is not an issue which we have seen discussed anywhere in the GSS or Delphi literatures, which tend to focus on intragroup behaviours. This is understandable in the case of the GSS literature where the methodological focus is on experimental rather than naturalistic research but it is rather more surprising that it is also the case in the Policy Delphi literature.

Moderating the exercise

Observing

A central part of a facilitator's role is of observing the group, particularly at the level of the group's emotions (Phillips and Phillips, 1993). However, in a distributed process direct observation is simply not possible, and there is a clear danger that without the moderator being aware, people may become confused about what is expected of them, or unhappy or resentful of the process in way which would be evident in an interacting group.

The most immediate symptom of participant distress is when people do not participate in the process. If this happens, it is relatively easy to contact the participant, find out the reason for non-participation, and, if possible, address this reason. As well as this, the process-related questionnaires which we submitted for research purposes along with the substantive communications were sometimes useful in picking up any issues. There are limitations in the use of written media to communicate emotions, however, and it was often only in the post-exercise interviews that the nature and depth of participants' reactions to the process became evident. A possible future direction might be to provide a facility for participants to submit voice- or video-clips, on the assumption that these richer communication media will transmit affect more clearly.

Intervening

In facilitating an interacting group, one of the decisions confronting the facilitator is the degree of structure of any intervention (Schwarz, 1994). Some interventions ("macro interventions") will be required to provide a broad framework for group discussion, whereas other interventions ("micro interventions") will deal with issues which relate to particular exchanges between participants. It is possible to think of the questionnaires which we sent out in our Delphi-like exercises as being highly

structural interventions in this sense: one of the features of a distributed exercise is that the more targeted, micro interventions which are possible in a workshop are not available.

An early experiment was made to present the participants, not with questionnaires, but with maps, and ask them to elaborate the maps (as might happen in a workshop). This was not a success, as participation fell dramatically when this was attempted, and subsequently in interview participants expressed discomfort at the lack of guidance given and the difficulty of the task. A greater degree of direction appears to be required in distributed sessions, perhaps because lack of opportunities for participants to learn appropriate behaviour through experimentation and feedback.

Synthesising

An issue which arose in our exercises is that the burden of integrating responses falls on the moderator. Backroom analysis is not new in PSMs: in the traditional SODA process maps are elicited in individual interview and merging of maps is typically carried out away from the participants. However, the current process resembled more closely the Oval Mapping variant on the SODA process in that what were elicited were not integrated, internally coherent maps, but individual concepts, which were then clustered and structured to form a single group map. However, whereas in an Oval Mapping session there is scope for interactive validation as the clustering and structuring is done in the workshop itself, in the current process, structuring and clustering was done on the basis of the moderator's unaided judgement, with the result that the emerging model was not as fully validated with participants as would be the case in a workshop.

It is in principle possible to design procedures for eliciting clusterings and network structures for ideas from individuals and then aggregating these structures. A process for eliciting clusterings of concepts from a number of individuals and then aggregating these clusterings to develop a group clustering has been developed by Trochim (1989). Similarly, cross-impact grids could be used elicit a structure on a set of ideas from individuals, and the grids could be aggregated. However, such procedures would impose a greater burden of effort on the participants, and it is an open question whether this would be useful or practical.

Monitoring outcomes

Learning

A key outcome of a workshop based PSM session is learning (see e.g. Bryant, 1989, p150; Friend and Hickling, 1997, p. 278). In the exercises we conducted, participants did by and large agree that they had learned through the distributed interaction, particularly about the views of the other participants (this was one of the things we monitored systematically using the process questionnaires).

Obviously, self-reports that learning took place are positive but limited indicators. An attractive idea would be to somehow embed a way of measuring learning into the process itself. This is feasible (up to a point) in traditional Delphi, which asks participants essentially the same quantitative questions round after round. This makes it possible to trace, if not learning as such, then at least opinion change. Van Dijk (1990) describes this sort of analysis of a Policy Delphi application. In a more qualitative exercise, like the present, where many of the questions were open-ended, it is hard to see how this could be done. If a more structured approach to map elicitation was taken, such as that proposed under the discussion on "synthesising", this sort of analysis may become possible, however.

Action

The main substantive objective of the exercises was in every case to inform some sort of program of action – either a doctoral research workshop, or changes to the research methodology course, or the formation of a policy network. In no case did the exercise itself lead directly to a set of actions: rather it led to a map of the issues which was given to a decision making subgroup which was then able to make a more informed decision in session about how to proceed. This disconnect did make it hard for some participants in the distributed process to see a connection between the process and the eventual outcomes. Even in the DRW exercise, where the action was a defined event and participants were interviewed after the schedule for the event was published, there was wide variance in participants' perceptions of the extent to which the exercise had influenced the result.

This should be contrasted with a traditional PSM workshop where the aim is often to arrive at a shared way forward or "commitment package" which is often agreed in the workshop itself. In contrast, Policy Delphi is described by Turoff (1975) as device for surfacing and structuring issues, a "tool for

the analysis of policy issues and not a mechanism for making a decision". This seems more similar to the role of our distributed process. We shall develop this notion further in the next section.

Research question 2: when to use the distributed modality

The preceding section was concerned very much with how the issues which arise in moderating distributed interaction differs from the issues which arise in facilitating workshops. However, our second research question is one of *under what circumstances* to use the distributed modality. Throughout the course of the action research studies described above, it became increasingly apparent that the sort of tasks and groups to which the distributed modality seemed to be best suited (in both our eyes and in the eyes of the client), may not be the same as the sorts of tasks and groups which a PSM workshop supports. In this section we seek outline some central issues and relate these to some theoretic considerations.

Task

One way to analyse the PSM process is to distinguish a "divergent" and "convergent" phase, the divergent phase being concerned with somehow opening out the issue, and the convergent phase being concerned with arriving at agreeable actions. This sort of framework is evident in Ackermann and Eden (1997) and Shaw *et al*. (2004), and echoes the more general phase models of decision processes (e.g. Mintzberg *et al*., 1976) which originate in the work of Herbert Simon.

The exercises which we conducted were primarily intended to support the divergent phase, in that the outcome of the process was not a portfolio of actions, but a map of the issue which was passed on to the person or people who would in fact be taking the decisions. In that these exercises were relatively well received by the client, it seems that this sort of distributed process is a viable mechanism for support the divergent phase of problem structuring.

This divergent phase of the PSM process has much in common with the idea generation tasks which have been extensively studied within group dynamics. A relatively stable finding in this literature is that in idea generation, interaction can be a hindrance, and techniques for barring interaction (such as Nominal Group Technique) can be quite effective. Although not yet conclusive, the evidence suggests

that this is largely because of "production blocking" in face-to-face meetings: restriction on airtime means that potentially creative ideas are never expressed (Stangor, 2004). This supports the suggestion that a distributed process may be an appropriate mechanism for supporting the divergent phase of problem structuring.

The convergent phase of the PSM process, however, tends to be viewed as an interpretive negotiation, as we note above: group members are seeking to define a shared reality which will guide organisational action. Seeking to establish agreement about meanings and their operational consequences is a more complex, equivocal task which requires a much richer, more expressive communication medium (Daft and Lenger, 1986). Indeed, the theory underlying interpretive negotiation this view tends to emphasise direct, rich interaction, such as (in the case of Bryant) Goffman's (1970) theory of face-to-face communication as "strategic interaction" or (in the case of Eden and Ackermann) Weick's (1995) notion of sensemaking via the "double interact".

It would be rash to claim absolutely that the convergent phase of problem structuring can never be supported by a distributed process and clearly there are many relevant factors, both in terms of the organisational context, and in terms of the technology used which determine the fit of the process to the task. However, it does seem intuitively that the fit between the convergent phase and a distributed approach is much weaker than is the case for the divergent phase, and the theoretic considerations cited above may go some way to substantiating this claim.

Group

A useful way to think about the participants in a PSM process is presented in Friend and Hickling's[3] map of the "groupings" in a PSM exercise. This map shows seven such groupings: the core group, the responsible (steering) group, the working group, reference groupings, representative groupings, the stakeholders, and the accountable (decision making group) group, all arranged on two dimensions, reflecting their political and technical role in the process. A message of this diagram is that it illustrates that any PSM process touches a small number of core people directly, and a large number of peripheral people more indirectly.

A shared feature of the exercises were that they were generally conducted with people who would normally be considered stakeholders or reference groupings, and so relatively peripheral in the process. This suggests that the most meaningful comparison may not be between conducting a PSM workshop and running a distributed process, but between involving a group of stakeholders via a distributed process as opposed to not involving them at all.

This observation further suggests that one way to look at the distributed modality may be as a way of conducting "large group interventions", a topic which has generated some interest in the PSM literature recently (Shaw *et al*., 2004; White. 2002). Indeed, there are case studies of distributed GSS and, indeed, of the Delphi method itself, which suggest that these methods are useful vehicles for involving a large number of organisational actors in a decision process (van Difk, 1990; Arkenstein, 2004). Another area where the distributed modality may be applicable and useful is in collaborative settings (Stringer, 1967; Huxham, 1993; Ackermann *et al.*, 2005). In collaborative relationships, there is normally a particular need for the development of a shared understanding, and yet arranging for face-to-face interaction is particularly difficult and challenging in such projects.

A question which arises in such "large group interventions" where interaction is not direct, however, is the extent to which such a collectivity is in fact a group in the traditional social psychological sense. McGrath (1984) defines groups as "those social aggregates that involve mutual awareness and potential mutual interaction" (p.7). This is contrasted with other social aggregates such as "publics" who are, in McGrath's terms, "a set of individuals who are attending to a common set of issues; have some form of indirect interaction regarding these issues; and are aware of a common interest, though they are not necessarily in direct physical proximity" (p.6). While these are clearly poles on a spectrum, it seems clear that a set of participants whose interactions are mediated by a distributed process are less "groupy" than the participants in a workshop, and one could reasonably ask the question whether this collectivity is a group at all.

The issue of task and group are clearly interrelated. While publics of various sorts clearly have some interest in the outcome of a decision process, and can provide valuable input to the framing of the problem in the divergent phase, we follow Friend and Hickling in observing that it is normally a core

group which is responsible for converging to a final decision. In our experience, the very features of the distributed process which made it appropriate for supporting publics – the relatively low time commitment, the relaxation of the requirement for physical proximity – were exactly the features which made it inappropriate for such core, decision making, groups.

Conclusion

In this paper, we have presented some of our experiences in using a the distributed modality within a PSM intervention. The organising research questions have been the identification of issues which distinguish the moderation of distributed interaction from the facilitation of a PSM workshop, and the identification of the circumstances under which distributed interaction may be appropriate. While we have tried to draw parallels with other research on supporting distributed groups, the current paper is distinctive in that it approaches this topic from a PSM perspective. A valuable feature of the PSM paradigm is that it allows research which is directly action-relevant and at the same time has some relation to social science theory, and we have tried to be faithful to this aspect of the PSM tradition.

Particularly viewed from the point of view of experimental research, the work reported here may appear to be limited in that we do not seek to present general statements or laws about human behaviour. The reason is that while the case study can be a vehicle for generalisations (Yin, 2003), we believe that in order to make generalisable claims a strong sampling logic is needed, which is rarely possible with action research.

This does not mean that action research cannot contribute to general theory, if theory is understood to be a way of thinking about a particular phenomenon. Indeed, action research must contribute in this way, otherwise it cannot be said to be genuinely research (Eden and Huxham, 1996). Our view would follow that of Eden (1995) who describes the role of case studies as follows: “Good case studies are often expected to… be representative; revelatory and be an extreme case… The reader is expected to judge the plausibility and representativeness of the cases and to translate the particular experience across to other potential situations” (p308).

Even in terms of this objective, we note that the representativeness of the studies reported here may be limited in that four out of six took place within a university (which is hardly representative of the sorts of organisation in which most people work), and none of our studies took place within the context of a for-profit company. Nor did any of our clients pay consulting fees for the work described here, as this was undertaken by the first author for his Ph.D.

A general theme throughout has been that judiciously using distributed interaction does open up the possibility of facilitating the involvement of quite different sorts of groupings in the PSM process than has hitherto been practical. In this sense also, the current research is, we hope, true to the original spirit of the PSM movement, which seeks to provide tools to enable relatively peripheral stakeholders to become involved in organisational or policy decisions.

We do have some hopes for taking some of these ideas further. A theme which has been developed in the discussion have been the potential of computer technology and there is a great deal to be explored going down this route. Existing technologies for supporting workshop groups (such as Group Explorer – see Ackermann and Eden, 1997) have been quite successful and a natural question is how such technologies could be grown to support distributed interaction. In the meantime, we hope that we have provided a thought-provoking glimpse of a possible "new direction" for Problem Structuring Methods.

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Table 1 Overview of the cases						
	DRW		RMC		PTT	
Exercise	ONS	OFS	MSS	FRS	SEP	CFL
Participants	On-site research students	Off-site research students	Doctoral supervisors from one academic department	Research students across the faculty	Members of SEP policy network	Members of CFL policy network
Technology	Three round process, using networked fileserver and WWW	Three round process, using paper and pencil	Three round process, using paper and pencil	Three round process, using paper and pencil, and meeting	Two round process, using paper and pencil	Two round process, using paper and pencil, and meeting
Outcomes	Departmental research workshop		Changes to Research Methodology Course		Report to client	*Initial Statement* of policy network

Figure 1. Page from a questionnaire

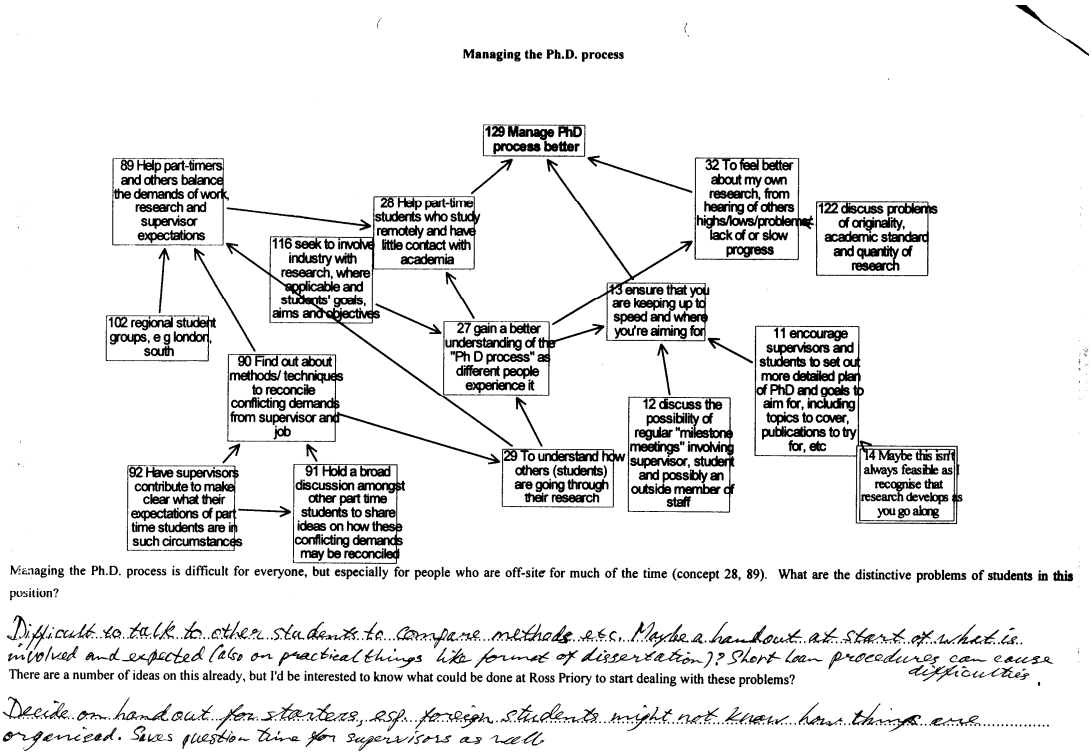

Table 2. Key actions of the moderator in distributed exercises

Setting up the exercise	*Moderating the exercise*	*Monitoring outcomes*
Motivating participants Designing the structure of the exercise Establishing a relationship with the client	Observing Intervening Synthesising	Learning Action