Facilitating Collaboration with Problem Structuring Methods: A Case Study of an Inter-Organisational Construction Partnership

L. Alberto Franco

Abstract   Despite the potential of inter-organisational collaboration to create 'collaborative advantage' among participant organisations, not all collaborations realise this potential due to the complexities and challenges faced by potential collaborators. To address these difficulties and increase the likelihood of collaborative success, different forms of intervention approaches for fostering inter-organisational collaboration has been advocated by collaboration researchers and practitioners. These intervention approaches all facilitate interaction and consensus formation among the participants. However their 'added value' is procedural rather than substantive in nature. They do not incorporate tools which can enable participants to structure the complexity of the web of factors that are implicated in their collaboration, and thus make it more manageable. This paper argues that problem structuring methods (PSMs), a family of model-based approaches to group decision and negotiation support, are a form of intervention which can provide a balanced attention to both the process and the content of inter-organisational collaboration, and reports the experience of applying a particular PSM to an inter-organisational collaborative partnership in the UK construction industry. Drawing on the rich data generated from the intervention, the paper discusses the impact of the PSM in supporting the joint appreciation activities carried out by collaborators to address their problematic situation. Implications of the experience for the research and practice of PSMs within collaborative contexts are then presented.

Keywords   Problem structuring methods · Inter-organisational collaboration · Group decision and negotiation support · Intervention

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1 Introduction

Several forms of inter-organisational collaboration have emerged in recent decades as a response by organisations to the complexity and turbulence of their environments. Typically, the particular form a collaboration adopts will depend on the aims pursued by the potential collaborators including: staying competitive; reducing uncertainty; obtaining legitimacy, resolving a conflict, and developing a shared vision (Barringer and Harrison 2000; Faulkener and De Rond 2000; Gray 1989; Huxham and Vangen 2005). Inter-organisational collaborations can range from strategic alliances, partnerships and networks (Doz and Hamel 1998; Gulati et al. 2000; Harrigan 1988; Osborne 2000; Saxton 1997; Sullivan and Skelcher 2002), to less institutionalised collaborations among a wide variety of stakeholders concerned about complex issues they cannot solve unilaterally (Carpenter and Kennedy 1988; Gray 1989; Huxham and Vangen 2005; Phillips et al. 2000; Westley and Vredenburg 1991; Wood and Gray 1991). Whatever the specific form of collaboration adopted, its general purpose is to enable organisations to manage a sub-set of their remits together (Huxham and Vangen 2005).

Despite the potential of inter-organisational collaboration to create 'collaborative advantage' among participant organisations (Huxham 1996a; Huxham and Vangen 2005), not all collaborations realise this potential. Indeed, the complexities and challenges faced by organisations wishing to engage in collaboration has been widely acknowledged in the literature (Gray and Clyman 2003; Huxham and Vangen 2005; McCaffrey et al. 1995). These include: managing ambiguity, complexity and dynamics in collaboration membership (Huxham and Vangen 2000); dealing with issues of inter-organisational trust (Hardy et al. 1998), creating a collective identity (Beech and Huxham 2003; Hardy et al. 2005) or resolving identity-based conflicts (Rothman 1997); re-framing of inter-organisational issues (Gray 1997; Lewicki et al. 2005); and balancing power asymmetries among the collaborating organisations (Gray 1985; Hardy and Phillips 1998).

To address these difficulties and increase the likelihood of collaborative success, collaboration researchers and practitioners advocate different forms of approaches to fostering inter-organisational collaboration (e.g. Bryson and Anderson 2000; Gray 1989; Healey 1996). Such intervention approaches rely heavily on the use of a third party to design and facilitate the interactions between actors representing the collaborating organisations. Examples of well established approaches which can provide this function include search conferences (Emery and Purser 1996), future search (Weisbord and Janoff 2000), whole system thinking (Pratt et al. 1999) and open space technology (Owen 1997).

The 'added value' of these approaches, however, is procedural rather than substantive in nature. They do not incorporate tools which could enable actors to structure the complexity of the web of factors that are implicated in their collaboration, and so make it more manageable. Since collaborators enter with different experiences, interests and perspectives, any such analytic assistance will not only need to capture the nature of the issues which constitute the domain of the collaboration. They must also pay attention to how these issues are structured and defined by the collaborators (Dutton and Duncan 1987; Eden et al. 1981; Gray 1997; Hardy et al. 2005; Hardy and Phillips 1998), and how collaborators and issues are interrelated. As both Gray (1989) and Hardy and Phillips (1998) note, the construction of issues by actors represents a critical aspect of collaboration because it significantly affects the outcome of inter-organisational interaction, as well as plays an important role in determining who participates in the collaboration in the first place.

This paper argues that problem structuring methods (PSMs) (Mingers and Rosenhead 2004; Rosenhead and Mingers 2001), a family of model-based approaches to group decision

and negotiation support, are a form of intervention which can provide a balanced attention to both the process and the content of inter-organisational collaboration. The (facilitated) building of explicit models which is characteristic of PSM interventions allows for the capture and analysis of both the process and content issues constituting a complex problematic situation that a group of multi-organisational actors wish to alleviate by collaborating.

The notion of attending to both procedural and substantial aspects of collaboration during interventions is not new. Huxham (1996b), for example, argues that a key concern for those assisting collaborators is to simultaneously consider the issues over which collaboration takes place and the nature of the collaborative processes themselves. This paper reports and reflects on the experience of designing a PSM-based intervention using these principles, and implementing it within a partnership context. By drawing on rich data generated from the intervention, the paper aims at increasing our understanding of how a process of inter-organisational collaboration is facilitated by the use of PSMs.

The motivation for this paper is twofold. First, work on the potential usefulness of PSMs for inter-organisational collaboration is beginning to appear in the literature (e.g. Ackermann et al. 2005; Bryant 2004; Friend 2006; Huxham 1996b; White 1996), and this paper intends to make a further contribution to this area. In addition, the research reported in this paper responds to the need for more field work in the general field of group support systems (to which PSMs belong), which tend to favour the experimental research approaches against interpretivist designs (Morton et al. 2003; Pervan 1998; Pervan and Atkinson 1995).

The rest of the paper is structured as follows. The next section discusses collaboration from a social ecology perspective, and identifies 'joint appreciation' as a key collaboration task which needs intervention support. Next, the general characteristics of PSMs are briefly discussed, and the role of PSMs in supporting joint appreciation is identified and argued for. The subsequent sections present an account of the application of the Strategic Choice Approach (Friend and Hickling 2005), a particular type of PSM, within a construction partnership in the UK leisure sector; and a grounded analysis (Strauss and Corbin 1998) of the data generated from the intervention. The final section discusses the contributions of this research to the theory and practice of PSMs within collaboration contexts, and identifies future research directions.

2 The Nature of Inter-Organisational Collaboration

Different theoretical perspectives have been used to conceptualise inter-organisational collaboration including transaction cost economics, exchange theory, organisational learning and institutional theory (for reviews, see Barringer and Harrison 2000; Gray 2000; Osborne and Hagedoorn 1997). In this paper, drawing primarily on inter-organisational domain theory (Brown 1983; Gray 1989; Hardy and Phillips 1998; McCann 1983; Trist 1983; Westley and Vredenburg 1991), collaboration is conceptualised as a well-adapted response to inter-organisational problem domains. A problem domain is not an objectively given entity but one that is socially constructed (Berger and Luckmann 1966), and one which emerges when a set of actors (individuals, groups or organisations) become interdependent on one another because the actions that each other takes with respect to the problem generate potentially unpredictable consequences for the others and vice versa (Gray 1989; Hardy 1994; McCann 1983; Milward 1982; Trist 1983).

Gray (1989) defines collaboration as "a process through which parties who see different aspects of a problem (domain) can constructively explore their differences and search for

solutions that go beyond their own limited vision of what is possible" (p. 5). By collaborating, the differences in actors' views, interests and knowledge about a problem domain become a valuable asset, enabling actors to develop a shared understanding of the problem before they reach agreement on subsequent action. Thus through inter-organisational collaboration, Gray argues, actors who previously had different (and perhaps conflicting) views about the problem domain can together create a shared understanding of it.

Organisational life, and the same could be said about inter-organisational life, is comprised of an indefinite and large number of issues, most of which can be and are ignored. Organisational actors choose to recognise those that become salient as obstacles to progress or opportunities for progress (Dutton and Duncan 1987; Ocasio 1997). It is the process of recognition and articulation that produces a 'problem' to be managed, something to which it is appropriate to devote time and effort. 'Nascent domains' become fully fledged 'problem domains'. The process of creating and naming problem domains, however, is not a straight forward process: effective problem scoping at this stage affects any future success in resolving issues. This precedes Checkland's (1981, p. 165) move from 'the problem situation unstructured' to 'the problem situation expressed' as noticing there is a problem situation at all is an often unrecognised stage in issue management.

Creating a shared understanding about the problem domain requires actors to engage in a process of 'joint appreciation' (Gray 1989; Vickers 1995), which involves sharing actors' appraisals of the problem domain as well as trading individual and collective perceptions of what is possible and desirable for its future. Specifically, this process requires the elicitation of information about the domain from actors. These include their judgments about what the domain is, and what it will or might be on various hypotheses. The information is then structured so that the issues and actors that constitute the problem domain will be clarified, stakeholders identified, and an identity and mutually agreed upon boundaries for the problem domain will be created (Gray 1989).

The establishment of an identity and boundaries for the problem domain will not necessarily transform the interests of actors which will in general remain distinct. To achieve agreement on a way forward within the problem domain there will therefore remain a need for negotiation among actors. Successful negotiation will lead to joint agreements that may take the form of policy recommendations to the actors' constituencies, or ad-hoc arrangements that need not involve formalised agreements concerning actors' future interactions for which routinised procedures are specified. It is possible, however, for stakeholders to create formal, long-term structural arrangements as mechanisms to support and sustain those activities which contribute to their joint appreciative activities (Gray 1989). These formal arrangements may include rules governing future interactions among stakeholders and the design of stakeholders' roles and responsibilities.

There are some intervention approaches specifically designed to support joint appreciation activities. For example, search conference (Emery and Purser 1996) and future search (Weisbord and Janoff 2000) are designed to build a common awareness among prospective collaborators regarding the issues constituting a problem domain. Such interventions structure an inter-organisational dialogue among actors about the broad contextual influences affecting the domain as well as their individual and collective aspirations and preferred strategies for influencing the future of that domain (Gray 1989).

However, these approaches tend to provide only 'process' support during joint appreciation, and do not offer methods and/or tools to support the structuring activities in which actors engage when attempting to define the nature and boundaries of the problem domain. As stated earlier, the way in which a problem domain is structured and defined has important implications for the development of inter-organisational collaboration. Not only does it

constrain in particular ways the nature and potential outcomes of collaboration, but it can also play an important role in determining who is perceived as 'legitimate' to participate in the collaboration (Gray 1989; Hardy and Phillips 1998). For example, a particular definition of a domain issue may lead actors with a stake in that domain to form coalitions which can include or exclude certain participants from the domain (Cushman and Rosenhead 2004; Horlick-Jones and Rosenhead 2002). Problem structuring, therefore, is a significant mechanism through which during joint appreciation stakeholders can influence the nature and future of a problem domain.

It is argued here that the presence or absence of the type of analytical assistance provided by problem structuring methods (PSMs) (Mingers and Rosenhead 2004; Rosenhead and Mingers 2001) might be expected to make a difference to the effectiveness of the joint appreciation process. This argument is further developed in the next section. The discussion starts with a brief review of the generic characteristics of PSMs.

3 Problem Structuring Methods for Collaboration

Problem structuring methods (PSMs), also known as 'soft' approaches within the operational research and management science fields, are a family of methods whose purpose is to assist groups of diverse composition gain a shared understanding of a problematic situation of common interest, and which is characterised by high levels of complexity, uncertainty and conflict. This is achieved through modelling and group facilitation, with a view to generating consensus on problem structure, and usually, on initial commitments to consequential action (Rosenhead and Mingers 2001). Examples of well-established PSMs include: strategic options analysis and development (SODA) (Eden and Ackerman 2001), soft systems methodology (SSM) (Checkland and Scholes 1990), the strategic choice approach (SCA) (Friend and Hickling 2005), and drama theory (Bennett et al. 2001).

The technology available with PSMs is essentially *model-based*. Modelling is the defining characteristic of these methods that gives them their unambiguous management science identity. This distinguishes them from, for example, other modes of group working such as those employed for organisational development (e.g. Rothwell and Sullivan 2005; Schein 1998). PSM models provide actors with a 'transitional object' (De Geus 1988; Eden and Ackermann 2004) which can be used to increase their multiple understandings of the problem situation, and negotiate future courses of action.

Furthermore, PSM models are expressed in visual, diagrammatical form, and mostly use participants' own language rather than mathematics or quantitative data to represent the problem. PSM proponents argue that only language has the degree of richness and transparency suitable for the modelling of complex problematic situations (Checkland 1981; Eden et al. 1983). Furthermore, the type of models built with PSMs are said to be requisite (Phillips 1984). This means that they contain sufficient knowledge and information to help participants find a way forward.

It has been claimed that diagrammatical methods are of particular value in representing complexity to lay audiences who might otherwise find traditional management science means of handling complexity opaque (Eden and Ackermann 2004; Rosenhead and Mingers 2001). In PSM models there is supposed to be nothing hidden, which makes them transparent and accessible. Indeed, these attributes of transparency and accessibility are aptly expressed in the settings and tools used for building PSM models: a room spacious enough for participants to move around freely and with movable chairs laid out in a horse-shoe fashion; large sheets

of paper attached around the walls of the room; a simple, non-permanent means of sticking papers to these walls; and a good supply of marker pens with contrasting colours are all that is usually needed for a PSM modelling session (Eden 1990; Hickling 1990; Huxham 1990). This suggests that PSM modelling is technically a relatively unsophisticated activity.

Models in PSMs are used to graphically represent, among other things, relationships between concepts, activities or stakeholders, relationships of similarity or influence, and relationships between options. Especially significant is the modelling of cause and effect relationships through which the different elements that make up the problem situation are identified. By modelling these relationships, PSMs are thought to help participants to 'look beneath the surface' to establish problem structure and create shared understanding about the complex problematic situation they face.

What role could model-based approaches such as PSMs play in inter-organisational collaboration? As discussed above, successful collaboration requires effective joint appreciation. This entails interaction among actors in order to evolve to consensual formulations regarding the problem domain. This interaction can be constructively facilitated in a variety of ways. Conventional (inter-)organisational arrangements achieve it through the sequential generation and critique of proposals, and/or by (possibly a series of) discussion meetings of representatives. These conventional methods most commonly operate through explicit consideration of alternative courses of action and their advantages and disadvantages.

Model-based collaborative processes require, en route to their resolution, agreement on formulations of what constitutes the problem situation. This is a more abstract approach than is adopted by conventional methods—where the context is more normally identified in a supposedly objective way. A consequence of the interactive approach to the structuring of information about the problem domain is to generate a greater degree of understanding among actors of the richness and dynamics of the issues and actors constituting the domain. The concern here is with domains of sufficient complexity, either substantive or procedural, to be problematic for the actors. In such circumstances the inter-relationships between concepts employed by actors may present cognitive difficulties. Model-based approaches, namely those which ascribe cause–effect and other relationships to the situation, can therefore be an advantage, since in their absence unnecessary confusions may result; or alternatively actors with superior communicative competence (Habermas 1984) may succeed in promoting partial interpretations which are to their benefit. Analysis secures a rule-bound discourse which in principle secures a level playing field in the interpretation of complexity.

With the analytic assistance available with model-based approaches, actors should be able to articulate an explicit framework consisting of the various issues which are perceived to be implicated in the problem domain, and how they interrelate; as well as interpreting and understanding what this articulated framework, and the actions that seem to be suggested by it, mean for them individually and as a collective. In this way model-based analysis helps actors to achieve a shared understanding of the problem domain which confronts them, and to transform it into a defined problem structure with clear boundaries. Another advantage of model-driven problem structuring and analysis is that it has the potential to make negotiations among inter-organisational actors more constructive and less antipathetic, so that the eventual accommodations are sincerely accepted.

These dimensions of inter-organisational decision-making have as yet being addressed only to a limited extent in the literature which is now beginning to appear on the potential usefulness of PSMs for inter-organisational collaboration (e.g. Ackermann et al. 2005; Bryant 2004; Huxham 1996b; White 1996). To further explore the advantages and limitations of model-based approaches for inter-organisational collaboration, a case study drawn from a larger action research programme in the UK construction industry is reported next.

The study involved the development and application of a PSM-based methodology intended to help construction teams in delivering the intended advantages of inter-organisational partnering.

4 The Case Study

The research reported was part of a larger action research programme in the UK construction industry (Cushman 2001). It was carried out during 1997–1999 in Whitbread plc, a large company operating in the UK leisure sector. Whitbread were engaged in a series of refurbishment projects of their hotels to meet the standards of their recently acquired four-star hotel franchise, as well as in the construction of new hotels. This construction work was taking place within a then recently established collaborative partnership between Whitbread and their major contractors and subcontractors, led by Whitbread. This move reflected a bigger move within the whole UK construction industry from traditional contractual arrangements towards more collaborative ways of working (Egan 1998; Latham 1994).

The partnership was entered with great expectations by the participant organisations. For Whitbread, partnering was seen as a novel way to reduce uncertainty about the product. Whitbread wanted to move away from a traditional tendering process in which the least costly tender was likely to be favoured by them, but where the quality of the final product was not always warranted. Whitbread's partners also saw the partnering relationship as a means to reduce uncertainty. In their case, however, the benefit of uncertainty reduction would lie in ensuring steady future work through a continuing partnering relationship. In addition, the partnership entailed certain obligations on the part of Whitbread's partners. Specifically, they had to be open and honest with Whitbread about their true costs and about what they expected to obtain over and above those true costs. For example, the settling of the project accounts had to done in an 'open book' format.

The need for openness and honesty required the development of high levels of trust among the partners. To demonstrate their commitment to developing a trusting relationship with their partners, Whitbread moved away from traditional written contracts and fully documented project specifications. This move meant that both the joint tasks and the partnership roles and responsibilities were initially ill-defined. As a result, they were open to multiple interpretations which made the communication between Whitbread and their partners extremely difficult.

A related issue was that of organisational interfaces. At the operational level, the main interface between Whitbread and their partners was the construction project teams. These teams would have regular meetings to review project progress. At the more strategic level, Whitbread had separate periodical meetings with representatives of their partner contractors, partner project managers, and partner quantity surveyors respectively. These meetings were aimed at reviewing both the projects and the partnering process. No forums for cross-discipline partner meetings at the strategic level were in place during the projects.

In summary, the partners' high expectations, the ill-defined nature of the joint task, and of partnership roles and responsibilities, and the lack of inter-organisational interfaces comprised a set of starting conditions that had a significant impact on the development of the partnership, and on the partners' initial evaluations about its perceived value. It is at this point that Whitbread established the need to set up an inter-organisational mechanism (at the level of the project teams) for reflecting about and learning from the partnership experience, so that coordinated action for improvement could be developed.

4.1 Designing the PSM Intervention

The field work involved the development and application of a PSM-based methodology intended to help construction teams in delivering the intended advantages of construction partnering (Franco et al. 2004). The methodology makes use of PSMs both to focus on the key issues faced by the partners at project and strategic levels, and as the basis for a generic project review processes. The adopted methodology was used by three multi-organisational project teams, drawn from the Whitbread partnership, to carry out a post-completion review workshop of their projects. The three workshops involved the post-completion review of two re-development projects and a design and build project.

The design and format of the workshops were based on Friend and Hickling's (2005) Strategic Choice Approach (SCA) methodology, a decision-centered approach to planning. SCA is a participative and interactive methodology that recognises the non-linear nature of group decision making and thus cycles through four modes of working: *shaping*, *designing*, *comparing* and *choosing*. In each of the four modes, information is elicited from the members of the group including: areas for choice (shaping); option portfolios (designing); criteria and uncertainties (comparing); and action plans (choosing). Once the information is evaluated and agreed upon by the group, it is transcribed to flip charts. These flip charts trace the progress of the decision-making process and are often photographed and issued as a record to assist group members after the meeting. SCA may, or may not, be supported by group software for all four modes.

SCA offers the scope to distinguish between decisions that need to be made now, and those that are best left open for future resolution. This distinction is expressed through a 'progress package' that also incorporates a balance between those areas of uncertainty to be tackled now by specific exploratory options (i.e. investigations, consultations or negotiations), and those that should be addressed, if at all, through some form of contingency planning.

Previous to each workshop, information about the project was collated through the gathering of participants' answers to a pre-workshop questionnaire. The purpose of this questionnaire was to allow the author to build a draft 'project review profile' and to formulate preliminary decision areas. Furthermore, as the time available for workshops was limited, the pre-workshop questionnaire helped in collecting information that would otherwise have required a whole session at the workshops, which was not possible.

Analysis of the questionnaires highlighted issues related to the project, as well as to the partnership process. Following Huxham (1996b), the workshops were designed to initially concentrate on those decision areas concerning project issues, and subsequently let issues about the partnership process emerged out of the discussion about project issues.

The format of the discussions was similar to that associated with a typical PSM workshop. That is, they were facilitated and the room was arranged in a horse-shoe layout without tables. It has been argued that PSM workshop facilitators working with multi-organisational groups have to be seen as legitimate by those participating in the workshop (Franco 2007; Huxham 1991). Therefore, it was decided that the workshops were facilitated by a Whitbread representative (an experienced facilitator), with the assistance of the author. Although the lead facilitator did not possess substantive 'collaborative expertise' (Huxham 1996b; Huxham and Cropper 1994) at the time of the intervention, he had sufficient experience and knowledge of Whitbread and their partners which could inform the actual conduct of the workshop process. The choice of lead facilitator also meant that it was important that he became familiar and comfortable with the method and the terminology used. As a result, the author produced an adapted, shortened version of SCA, where the method's working modes of 'shaping', 'designing', 'comparing' and 'choosing' were followed loosely, and

alternative common language explanations of its terms was provided to avoid confusion. Full details of this modified version of the SCA can be found in Franco (2005).

All workshops were held at, or close to, the project site and carried out in a 5-hour session. Each of the workshops comprised seven to nine participants representing a variety of stakeholders including the Whitbread's property division and operational management, the main project contractor, project management consultants, quantity surveyors, architects and designers, but did not include specialist trade contractors who were not part of the partnering arrangements. As the partnership involved a number of companies for each specialty, a different set of companies was involved in each workshop and only one company other than Whitbread was involved in more than one workshop.

4.2 PSM Application

The first use of the adapted SCA method took place during the post-completion review of a hotel & country club re-development project. At the beginning of the workshop, the facilitator started by explaining what it was hoped to have achieved by the end of the workshop. After these introductory remarks, and following the modified version of SCA, the project victories were considered first as a form of 'ice breaker'. Next, the draft candidate decision areas which had emerged from the pre-workshop questionnaire results were presented and the workshop participants were asked to comment on them so that they could be validated. The candidate decision areas had been written on post-it notes placed on a flip chart, which allowed for easy modification of concepts by participants, and for patterns, relationships and overlaps to be adjusted and displayed by positioning and linking. Also, the seating arrangements made it easy for the participants to post their own ideas and take an active part in what roughly corresponded to the shaping stage of SCA.

There was general consensus between the workshop participants about the areas where decisions needed to be made. The development of an effective and efficient briefing process was the main concern. This area was seen as strategic and crucial for the success of the partnership. During the workshop, the discussion moved away from strategic issues and concentrated on operational aspects of the re-development project. In particular, 'snags' (i.e. defects in the resulting product) was specified as the most urgent area to address. This area represented an operational issue related to the handover of the project which the hotel operator was most concerned about. Indeed, post-workshop interviews confirmed that the hotel operators were mainly concerned with discussing the operational issues affecting a project handover. This was in stark contrast to the views of the other workshop participants, who were mostly interested on addressing strategic issues affecting the Whitbread partnership.

During the latter part of the workshop, participants engaged in the development and prioritisation of options for action which roughly corresponds to the designing and comparing modes of SCA. Participants identified options within each of the two key decision areas (i.e. 'brief' and 'snagging'), and were encouraged by the facilitator to focus on options which they could effectively act upon. All the options surfaced were then discussed within the group to compare and evaluate in terms of their feasibility and consequences. Uncertainties were considered in the discussion although they were not explicitly articulated as such by the participants or the facilitator.

All participants voiced their opinions and concerns about the options surfaced. This discussion gave rise to agreements regarding actions to be implemented, together with their responsible actors and tentative deadlines. Following the workshop event, communications between Whitbread and the author confirmed that all the agreed actions regarding the outstanding snagging issues of the project, together with those related to the development of

a new generic snagging process for all partnership projects, had been implemented within a 2-week period.

The second use of SCA was during the post-completion review of the re-development project of another hotel & country club, which took place shortly after the first workshop. This re-development project was considered a 'problematic' experience by the partners, and workshop participants showed willingness to reflect on and learn from the experience for the future benefit of the partnership.

The workshop format followed was similar to that used at the first workshop. Participants were informed that some of the candidate decision areas which had emerged from the pre-workshop questionnaire results paralleled those which had been identified in the first workshop (for example, the area of 'snagging' had resurfaced). Consequently, and in order to gain maximum benefit for the partnership from the intervention, participants decided that the focus of the second workshop should be on decision areas not previously addressed and at the strategic, rather than operational, level. This particular focus was facilitated by the review taking place nearly 6 months after completion, so that operational issues were by then less salient.

The facilitator of the second workshop was the same as before, and on this occasion he had become more acquainted with the SCA method and thus was able to use the method with more confidence than before, as well as to make clear distinctions between decision areas, different types of uncertainties, and comparison areas during the discussion at the workshop.

Developing the right level of detail in the project brief was the main concern expressed by participants. Three aspects related to this preoccupation were the management of the interface between Whitbread and Whitbread partners, the access to information about existing operating hotels, and the knowledge and communication of roles and responsibilities within the partnership. These issues represented interrelated areas for choice. For example, any choices regarding the level of detail in the project brief were perceived to have an impact on the choices available for the management of the interface between Whitbread and Whitbread partners.

Some of the agreements reached by participants in the second workshop involved immediate actions; whereas others comprised actions of the exploratory type. This difference may have resulted, as previously mentioned, from the facilitator's greater familiarity with the processes, techniques and tools of SCA.

Finally, the last use of SCA was during the post-completion review of a design and build project for a new hotel in London. On this occasion the main focus of the workshop was on developing improved ways of managing project changes. This focus can be explained by the fact that the new hotel represented a particularly complex and expensive venture for Whitbread, a scale of project which they had never attempted before. In addition, the area of partnership development, identified as a decision area at the first workshop, was revisited. Post-workshop interviews indicated that the discussions held in the third workshop triggered a subsequent Whitbread-led strategic review of the whole partnership processes and agreement.

5 Analysis of Intervention Data

The information provided throughout this section is drawn from a mixture of data sources which comprised records from the workshops, research observations and notes; responses to the pre-workshop questionnaire; and transcripts from tape-recorded, semi-structured interviews carried out with workshop participants. All this information provided a rich data

base with which to examine the perceived role and impact of the PSM-based intervention within the Whitbread partnership.

The approach adopted to the analysis of the research data was based on 'grounded theory' (Glaser 1993; Strauss and Corbin 1998). The potential perceived for generating an understanding of the subjective meanings participants attributed to their experience of using the PSM during the workshops was the main motivation for its inclusion within the action research programme mentioned earlier. Furthermore, the analysis sought to understand how these subjective meanings fit into larger patterns of interaction within which the PSM-based intervention was embedded (White 2006).

The grounded theory approach offers a way of analysing qualitative data that systematically develops hypotheses or theories about the phenomena which have been observed. It allows the systematic identification of a set of conceptual categories and their interrelations which develop as the analysis continues. These emerging 'grounded' concepts, derived from the data, are then used as the basic building blocks of the growing theoretical understanding of the phenomenon under study (Turner 1983). The coding and categorising process was facilitated by the use of the *Atlas.ti* software (Muhr 1997).

5.1 First Order-Analysis

A first-order analysis of the data produced a number of themes. First, workshop participants expressed the unanimous view that the PSM used was a transparent mechanism which helped them to understand each other, and to structure, clarify and learn about the issues confronting them. A partner consultant commented:

The way that those issues were correlated into groups, was open.…I think those points which were brought up were all valid. I think that it certainly served to appreciate other people's difficulties within the process. And I think those items – or those points – that were chosen to go forward with were valid.

Second, most workshop participants acknowledged the representation, structuring and prioritisation of the issues as flexible and efficient. A property development manager noted:

I did appreciate that obviously you did change the direction it was going at [the workshop] to cater for the issues that we had, like the snagging issues, because they were at the top of the agenda at the moment

Third, all participants stated that PSM workshop allowed them to openly discuss and jointly examine the issues affecting them, and that it was the openness forced upon them by the model-based workshop approach which reduced opportunities for deliberate manipulation during their discussions, and significantly contributed to the high levels of supportability and ownership of the commitments achieved during the workshops. Participants also expressed that the discussion format and workshop layout reduced the chances of them 'taking positions' during the reviews. Typically, construction project meetings are driven by highly structured agendas and are led by the project manager. They are held around a table with each participant having a large number of papers in front of them, but each agenda item typically only involves two or three of the people present. Participants stated that the workshop discussion format made them felt comfortable to become involved and express their views freely. As a partner contractor explained:

The fact is you didn't have a table at all,…everybody sat in a semicircle, and we were able to face each other without the protection of the table and they had the opportunity

to have their say…In a formal [construction] meeting (we) would have had a certain amount of "taking a position". You know, we would have taken a position that "no, we don't agree with that and we are not going to…" you know, that's a natural…you are reverting to type then and, right or wrong, people would take a stance. But taking away the table and mixing the people up you can't take a stance because there's no table (in) between, you just talking to the guy. And if you are not telling the truth, you know,…it's easier to lie when you've got a table in front of you or to put a slant on things than it is when there is not table there and you are in an open forum. And I think it's the open forum which made it work.

To summarise, the first-order analysis produced the following themes regarding the perceived impact of the PSM intervention: effective problem structuring process, highly participatory process; and high supportability and ownership of workshop commitments.

5.2 Second-Order Analysis

In order to further understand how and why these impacts were achieved, a second-order analysis was conducted. This involved revisiting the data and reflecting on the findings, looking 'beneath the surface' to identify some 'middle-range' theories about the PSM intervention (White 2006) in the collaboration context. The theories that surfaced were related to 'dialogue', 'power' and 'learning'.

Within a collaboration context, dialogue is the means through which multi-organisational actors gain a broader appreciation and shared understanding of the problem domain, in order to develop joint agreements with respect to it. During this multi-party dialogue, actors engage in joint problem construction as well as the negotiation of individual constructions and interests concerning the problem domain, akin to Pettigrew's (1977) notion of 'management of meaning', which is the process of seeking legitimacy for issues and solutions. The evidence suggests that the PSM intervention helped participants to explicitly articulate the interconnectedness of the various factors which were perceived to be implicated in the problem domain; and to interpret and understand what these articulations meant for them and their organisations. Furthermore, participants stated that the PSM models helped them to jointly structure, clarify and learn about the issues confronting the partnership, and increased their understanding of each other.

The PSM application had to deal with questions of openness and truthfulness: are the different actors, who operate in a construction industry characterised by a long tradition of adversarial relations, willing to make their (private) individual positions available and clear to others as well as to accommodate them to ensure progress is made? The partnership context suggests that this should be the case. However, it was clear from the pre-workshop questionnaires that the concept of partnership still needed to be made operational: partnership was something 'said' rather 'done' (Argyris and Schon 1974) by the partners. There was a clear indication that the mechanisms of the PSM workshops facilitated and open and honest exchange among actors. The issues captured by the PSM models were mainly drawn from the participants' knowledge and expertise, their experience of the projects, and their beliefs and expectations about the ongoing partnering process. Participants all agreed that these issues were openly discussed and jointly examined by all parties. Furthermore, the evidence suggests that it was the openness forced upon participants by PSM application which reduced opportunities for deliberate manipulation of issues.

Given the use of model-based analysis that is characteristic of PSMs, another concern was whether there were inequalities of technical or communicative competence which could

disadvantage actors during the dialogue. It was clear from the intervention that participants viewed the structuring formulations in the workshops as easily assimilable, and that they were able to make use of the structural elements of the PSM models within normal discourse, and without prior training.

The effectiveness of the dialogue between multi-organisational actors engaged in collaboration will be heavily influenced by the power balance of the actors participating in the dialogue. Whitbread and their partners had an asymmetrical power relationship which was evident from the early stages of the partnership. Whitbread potentially represented a continuous source of large-scale work for their partners and sub-contractors, which made them a very powerful player within the partnership. Indeed, one of the main concerns at the beginning of the intervention was whether the application of model-based approaches such as PSMs would only help to legitimise Whitbread's intentions rather than support genuine accommodations between the parties.

Differences in the power base provides the means by which multi-organisational actors can achieve desired outcomes in a deliberate and conscious way during dialogue. However, the power asymmetries among actors engaged in collaboration does not necessarily mean that the power base will remain static or changeless. For example, the achievement of collaborative advantage (Huxham and Vangen 2005) may lead to significant adjustments within the power base of actors. Following each of the three PSM workshops, adjustments in the Whitbread partnership relationship ensued.

There was evidence that Whitbread empowered their partners. For example, as a result of the intervention, Whitbread's partners were to sit on project reviews and meetings other than those in which they were directly involved; and Whitbread's partner contractors were given more control over Whitbread's suppliers (e.g. by withholding payment of suppliers until the contractors were satisfied with their performance). Overall, the evidence suggests that the PSM intervention contributed to facilitating mutual accommodations and high levels of commitment to the partnering relationship.

As already mentioned, the way in which problem domains are structured and defined influences the membership of a collaboration (Gray 1989; Hardy and Phillips 1998). The three PSM workshops had to deal with issues of participation in the partnership. During the workshops, the notion of increasing the partnership membership through downstream partnering was repeatedly raised. However, no decisions about involving other sub-contractors and direct suppliers were taken at the time but the evidence suggests that this was an issue which they wanted to consider seriously at some point in the future.

Learning is a significant drive for inter-organisational collaborations (Doz 1996; Gulati 1999; Hamel 1991; Inkpen and Crossan 1995; Lane and Lubatkin 1998; Powell et al. 1996; Simonin 1997). Usually learning is understood in terms of skills and knowledge between partners, but it can also be about adding value to the relationship by reducing costs and increasing the quality of joint products and processes as in the case of the Whitbread partnership. The use of PSMs in this context thus needed to be tailored to generate learning which could subsequently be applied within the partner organisations.

The evidence shows that the PSM intervention helped the participants to share their learning about the projects, and to capitalise on it. Two types of learning can be distinguished here. On the one side, the partners learn about the nature of the problems confronting them. On the other hand, each partner learns about the changes they perceive are needed to make the partnership work. One of the aims of the PSM workshops was to collate and integrate the learning achieved at the partner level, and foster joint learning between the partners. The joint exploration of links between the 'decision areas' contained in the PSM models, for example, appear to have been effective in this context.

There was a clear association between the learning produced in the PSM workshops actions that followed. The following examples illustrate the extent to which workshop learning was disseminated to other projects within the partnership. A large renovation project in Scotland was planned to start in January 1999. Participating in this project were Whitbread and one of their major partner contractors, who had taken part in one of the PSM workshops. Interviewed by the author, representatives of both organisations expressed that what they had learned at the PSM workshop was subsequently applied to the planning of this new project, even though there were no specific actions for the new project resulting from the earlier workshop. In addition, the same workshop format used in the PSM intervention was again used at another workshop for the review of a new hotel project (also in Scotland), and facilitated by a Whitbread representative who had participated in one of the earlier PSM workshops. This occurred without any prompting or supervision from the author.

These examples illustrate that the partners had a strong ownership of the processes and products of the PSM intervention, saw the method's usefulness, and applied what they had learned.

6 Discussion

Some of the intervention effects suggested by the preceding grounded analysis could have been due to the use of PSMs with a particular form of collaboration. Partnerships are a particular case of inter-organisational relations in which the need to interact together is of a continuous or recurring kind. There is therefore some form of institutionalisation of the relationship which, as already illustrated in the case of the Whitbread partnership, includes formal or informal interface structures for interaction. It is not unreasonable to see the existence of partnership arrangements as an indication of a basic, if possibly circumscribed, compatibility of purpose between multi-organisational actors. Thus it could be argued that partnerships are in principle an appropriate setting for the use of PSMs: a setting of multiple actors within a context of broad agreement which needs to be made operational.

It is also worth considering whether some of the reported effects in the intervention could have been due to the choice of method or facilitator. For example, the strategic choice approach (SCA) was specifically developed for use in multi-organisational settings (Friend 1990). However, it is never possible to be sure what would have happened if an alternative intervention approach to SCA had been used or a different facilitator had run the workshops. As Checkland (1981) and Eden (1995) argue, the characteristics of the problem situations for which PSMs have been developed make this kind of inquiry infeasible.

What are the implications of the intervention experience reported here for the wider use of PSMs in general, and SCA in particular, with inter-organisational collaborations? Generalisation will be discussed here from two related yet distinct standpoints. These are: generalisation from the Whitbread partnership to other partnerships; and from SCA to other PSMs.

The move toward partnerships within the UK construction industry represents a relatively recent trend. These partnerships are all different but with certain key characteristics in common:

- they are typically led by an individual construction client, who typically has a consistent flow of construction work on buildings or facilities to be used for their own business rather than for selling on for use by others;
- issues of the facility in use and whole life cost are particularly salient for these clients, and these can only be addressed by having a wider set of priorities than the cost of the facility at project completion; and,

- apart from the client, membership of these partnerships usually involves main contractors and project management consultants, and a range of professional firms and specialist sub-contractors, including: architects, designers, quantity surveyors, and mechanical and electrical contractors.

The Whitbread partnership reported in this paper is therefore in many ways characteristic of other construction partnerships.

There is also the question of generalisation from SCA to other PSMs. The application of SCA, as has been seen, generated some positive effects. The use of SCA and its effectiveness can be understood in terms of facilitating 'conversations' (Franco 2006) that generate a shared understanding and mutual accommodations among different stakeholder organisations facing a problem of mutual interest. The findings in this research also suggest a role in facilitating a multi-party dialogue among collaborators. However, these findings cannot be carried over unproblematically to the application of other PSMs in similar circumstances. PSMs are different yet they exhibit some similarities (Rosenhead and Mingers 2001). It is the similarities between SCA and other PSMs (e.g. model-based analysis) which give reason to be encouraged that they might also perform a useful role under these circumstances. So these findings are certainly a positive indication for the more general application of these methods. Provided that the problem domains of many partnerships share the characteristics of high interconnectedness of issues and actors, these findings seem to be potentially generalisable to other PSMs.

7 Conclusions and Further Research

This paper has argued that problem structuring methods (PSMs) are a form of intervention which can help multi-organisational actors achieve the intended advantages of collaboration by providing them with model-based analytical assistance during their joint appreciation activities. A well-designed PSM-based intervention pays a balanced attention to both the process and the content of inter-organisational collaboration by building models that capture actors' formulations and interests concerning the problem domain they wish to influence, and using these models to facilitate inter-organisational negotiation and mutual accommodations.

Using an approach to analysis based on grounded theory, examination of the rich data generated from a PSM-based intervention within a UK construction partnership identified a number of positive effects associated with PSMs: (1) allowing participants to engage in open and rich communicative exchanges during their discussions, and facilitated an increased mutual understanding of each other and of the problem domain; (2) contributing to the high level of support and ownership demonstrated by the participants to the agreements reached during their discussions, and by the subsequent implementation of such agreements; (3) the preceding effects indicated the achievement of a balanced dialogue among the partners; (4) accommodations in the power base of actors which resulted from the use of PSMs were evidenced in the negotiation and agreement of problem structures by participants, and in the adoption of SCA as part of standard inter-organisational procedures within the partnership. Indeed, a telephone conversation with Whitbread's property development manager 2-years after the intervention revealed that SCA had become embedded within Whitbread as a tool available to the partnership which they could and did apply in project reviews other than the ones reported in this paper; and, finally (5) there was evidence that SCA played a role in facilitating positive adjustments in the Whitbread partnership through the integration and dissemination of learning among the partners.

The approach to data analysis adopted in the study reported in this paper has rarely been used in group decision support research. Although all research approaches have strengths and weaknesses, the use of a grounded theory framework for data analysis was found particularly appropriate in gaining a further understanding of the perceived role and impact of PSMs in this particular collaboration. This paper argues that the grounded theory approach to data analysis has potential for use in a variety of contexts for group decision support researchers.

Some potentially valuable possibilities for further research can be proposed. First, although the Whitbread partnership is in many ways unique, it is in its essentials a perfectly representative construction partnership. In addition, the teams in this research could be seen as representing one of the many types of collaboration teams that are set up, whether in construction or not, to make decisions relevant to their common concerns, and which can have a variety of purposes including coordination, cooperation, problem-solving, policy formulation and information exchange. Therefore, given the positive effects reported from the application of SCA with this construction partnership, the possibility that SCA could have similar effects with other types of partnerships and/or collaborations outside construction clearly deserves further investigation.

Second, the intervention reported here covered the use of a single PSM, specifically of the Strategic Choice Approach (SCA). This method shares with other PSMs the purpose of enabling group interaction, encouraging participatory problem structuring and analysis, and generating shared understanding. Further work would be of value to investigate whether the findings established in this research extend to other PSMs used either in isolation or in combination with other methods. The evidence suggests the possibility that the distinctly positive impact which occurred in the intervention would also be observed in applications involving other PSMs and other collaborative contexts. To confirm this speculation would require further research. Also, given that PSMs have in general been criticised for their apparent inability to handle asymmetrical power relations (e.g. Healey 1997; Jackson 1982, 2000; Mingers 1992; Willmott 1989), it is worth investigating whether the mutual accommodations in the power balance of actors achieved in this intervention can also be obtained with other PSMs.

Third, part of the impact of PSMs in the intervention was conceptualised in terms of facilitating a dialogue among inter-organisational actors. Further empirical work in this area is needed. For example, a research design based on conversational analysis (Hutchby and Wooffitt 1998; Psathas 1995; Ten Have 1999) would in principle be capable of conducting micro analyses of participants' communicative exchanges during a PSM-based dialogue. Although conversational analyses of PSM-interventions are beginning to appear (e.g. Horlick-Jones and Rosenhead 2002; Horlick-Jones et al. 2001), the feasibility of implementing such research designs heavily depends on research access.

Fourth, the potential of PSMs to contribute to the achievement of inter-organisational learning has been identified in this paper. This raises a claim about PSMs which has not been considered previously in the relevant literature. It is at least arguable that other PSMs might equally be expected to play this additional role with actors operating within an inter-organisational collaboration context. However, such a hypothesis would need further work with other methods from the PSM family in order to be substantiated. This under-researched area within the PSM field represents a valuable opportunity to incorporate theories of intra- and inter-organisational learning (e.g. Doz 1996; Holmqvist 2003; Kumar and Nti 1998) within the PSM research agenda.

Finally, the facilitator in the intervention, who had never used SCA before, felt the need to adapt SCA, largely avoiding its technical jargon and several of its techniques and tools. The problematic transferability of PSM craft skills could be a limitation on the spread of PSMs

([Westcombe et al. 2006](#)), or could change their characteristics as a result of those who come to use them. This suggests the issue of transferability of PSMs craft skills as an important topic for empirically-based research. A related research activity would be to find ways of exploring those craft PSM skills that are needed.

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