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Conference paper

Facilitating Collaboration across Organisational Boundaries: an exploratory study using problem structuring methods

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ABSTRACT

Using the notion of multi-organisational collaboration as a process involving the creation of shared meaning, this paper argues that problem structuring methods (PSMs) can play an important role in facilitating such process. PSMs are a family of participatory and interactive methods whose purpose is to assist groups of diverse composition tackle a complex problematic situation of common interest. This is achieved through modelling and facilitation, with a view to generating consensus on problem structure, and agreement on initial commitments. In order to explore the potential of PSMs for collaboration, an application of a PSM-based methodology to a multi-organisational partnership in the UK construction industry is reported. The results of the study suggest that there is indeed scope for the use of PSMs for collaboration between organisations, and that these methods do appear to have a positive role in facilitating the achievement of some of their intended products. In particular, the experience as a whole tends to demonstrate that shared meaning, mutual accommodations and learning between collaborating organisations can be facilitated with the use of PSMs. The paper concludes with a discussion of the significance of the experience, and proposes some directions for further research.

Keywords: multi-organisational collaboration, problem structuring methods case study,

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1 Introduction

Several forms of multi-organisational collaboration have emerged in recent decades as a response by organizations to the complexity and turbulence of their environments. Typically, the particular form a collaboration adopts will depend on whether organisations wish to jointly develop a shared vision, resolve a conflict or gain 'collaborative advantage' (Gray 1989;Huxham and Vangen 2005). Collaboration can range from strategic alliances and joint ventures between business organizations (Das et al. 1998;Dickson and Weaver 1997;Doz and Hamel 1998;Harrigan 1988;Saxton 1997) to less institutionalised collaborations among a wide variety of stakeholders concerned about issues of common interest (e.g. Carpenter and Kennedy 1988;Gray 1989;Huxham and Vangen 2005;Westley and Vredenburg 1991;Wood and Gray 1991). Whatever the specific form of multi-organisational collaboration adopted, its general purpose is to enable organisations to manage their future collectively.

Different theoretical perspectives have been used to conceptualise collaboration including transaction cost economics, exchange theory, organizational learning and institutional theory (for recent reviews, see Barringer and Harrison 2000;Gray 2000;Osborne and Hagedoorn 1997). In this paper, following Gray (1989), multi-organisational collaboration is conceptualised as a socially negotiated order that evolves through a process of joint appreciation about a domain comprising a set of actors (individuals, groups and/or organisations), who have a common interest in a problem area which cannot be resolved unilaterally by any single actor (Gray 1989;McCann 1983;Trist 1983).

Problem domains usually defy a clear definition, which implies that it is not possible to speak of ‘the problem’. Rather, it is more appropriate to speak of actors confronted by a ‘problematic situation’ or ‘problematique’ (Quade 1980) consisting of clusters of interconnected problems. Gray (1989, p. 10) characterises such problematiques as follows:

- the problems are ill-defined, or there is disagreement about how they should be defined;
- the problems are often characterised by complexity and uncertainty;
- existing processes for addressing the problems have proved insufficient and may even exacerbate them;
- several stakeholders have a vested interest in the problems and are interdependent;
- these stakeholders are not necessarily identified a priori or organised in any systematic way;
- incremental or unilateral efforts to deal with the problems typically produce less than satisfactory results;
- differing perspectives on the problems often lead to adversarial relationships and conflict among the stakeholders;
- stakeholders may have different levels of expertise and different access to information about their problematic situations; and,
- there may be a disparity of power resources for dealing with the problems among the stakeholders.

The contextual characteristics of the problematiques described above broadly correspond to those for which a number of problem structuring methods (PSMs) have been specifically designed. 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 better understanding of a problematic situation of common interest, and which is characterized by high levels of complexity, uncertainty and conflict. This is achieved through modelling and 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 (Bryant 2003).

Indeed, the purpose and characteristics of PSMs appears to make them potentially valuable in assisting collaborators to structure and define the problem domain, to articulate the values affected by their choices with respect to it, and to make mutual adjustments in order to reach joint agreements about the future of the problem domain. However, despite the extensive literature on multi-organisational collaboration, little attention has been paid to the role and potential impact of analytical approaches in a collaboration context. This paper explores the core research question of how a process of multi-organizational collaboration is facilitated by the type of analytical assistance provided with PSMs.

The paper is structured as follows. The next section draws on negotiated order theory and discusses collaboration as essentially involving a meaning creation process. Next, the general characteristics of PSMs are briefly discussed, and a potential role for PSMs within multi-organisational collaboration is identified. Next, the methodology used to study the application of a PSM-based methodology to a multi-organisational partnership in the UK construction industry is described. The subsequent section then presents and discusses the results of the exploratory study. The final section discusses the contributions of this research to the theory and practice of multi-organisational collaboration, and identifies future research directions.

2 The social construction of collaboration

The negotiated order perspective of collaboration draws upon social constructionism (Berger and Luckmann 1966). From this view collaboration is conceptualised as the evolution of a negotiated order (Gray 1989), and achieved when actors share a common interpretation about the problem domain, and what coordinated actions should be taken with respect to it. At the early stages of collaboration, actors usually begin with different, often disjointed, conceptions of the domain (Gray 1989;Nathan and Mitroff 1991;Vaughan and Siefert 1992). In addition, they often have limited conceptions of how their actions impact on other parties and partial or mistaken perceptions about what the other actors want or believe (Gray 1989;Vansina and Taillieu 1997). By collaborating, the divergence in the actors' views, interests and knowledge becomes a valuable asset, enabling actors to develop a rich, shared picture of the problem domain before they reach agreement on a shared problem definition and potential options for subsequent action (Gray 1989). Thus through collaboration,

actors who previously shared no common meanings about the domain can mutually create shared meaning.

However, the creation of shared meaning through collaboration does not take place in a political vacuum and is often a contested process. Actors with a stake in the problem domain will try to influence the meaning creation process to their advantage (Hardy and Phillips 1998). One way in which actors can exercise such influence is by attempting to (re)define the issues that constitute the problem domain. These issues are not objectively present in the domain but socially constructed through 'conversations' which create meaning for them (Dutton and Duncan 1987;Eden 1986;Ford and Ford 1995;Hardy et al. 2005). Such conversational processes essentially represent a problem structuring activity which is influenced by actors attempting to 'manage meaning' (Pettigrew 1979;Smircich and Morgan 1982).

The way in which a problem domain is structured and defined has important implications for the development of collaboration. Not only it restricts the nature and potential outcomes of collaboration, but also it can 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 problem definition may lead actors with a stake in the domain to form coalitions so that certain participants can be included or excluded from the domain (Eden 1996). Problem structuring, therefore, is a significant mechanism through which stakeholders can influence the nature and future of a problem domain.

Given that the collaboration involves a meaning creation process, and that such process can be influenced by the interests and intentions of domain actors, it can be argued that the effective collaboration will only be achieved if shared meaning is created through a conversational process that includes include all stakeholders, on an equal basis, with the freedom to represent their interests and participate in a fair and open dialogue, not limited by coercion or manipulation, and which allows for the mutual accommodations between actors (Franco 2006;Hardy et al. 1998;Keller 1981;Payne 1991). This paper explores whether problem structuring methods (PSMs) could support such conversations between collaborators.

3 Problem structuring methods

PSMs are a family of decision-aiding approaches which are intended for use with groups. The key word in PSMs is 'structuring'. Within the PSM field, structuring is used in the sense of identifying concepts and activities which are relevant to the problem situation faced by a group, of clarifying the relationships between them, and of focusing on key areas and excluding others, at least temporarily. PSMs focus on generating changed understandings of the problem situation by and between participants, so that they can reach agreement both on the nature of their shared problem and on commitments which will address it (Rosenhead and Mingers 2001).

Before we clarify the potential role that PSMs can play in the collaboration process, a more detailed characterisation of the processes of applying PSMs, their available technology, and their intended products is needed. These characteristics, listed in Table 1 below, will be discussed next and appear in *italics*.

INSERT TABLE 1 ABOUT H|ER|E

3.1 PSM process

As stated earlier, the orientation of PSMs is to aid *groups* in agreeing the nature of a problem situation they face so that progress can be made. When group members participate in a PSM process, they are encouraged to openly exchange their understandings and views about the problem situation which is being structured. The PSM process is therefore claimed to be *participative* in the sense that group members are able to jointly construct the problem situation, make sense of it, arrive at a shared problem definition, and develop a portfolio of options relevant to the problem so defined (Rosenhead and Mingers 2001). This participatory process is usually *facilitated* by a researcher or consultant (Ackermann 1996;Phillips and Phillips 1993).

It has been argued that the PSM process is *interactive* (Rosenhead and Mingers 2001), both in the sense that it requires interaction between participants, and in the sense that they interact with the analysis. This latter interaction reshapes the analysis, and the analysis reshapes the discussion. The PSM process is also thought to be *iterative* (Rosenhead and Mingers 2001), because the process is repeated until the problem situation is satisfactorily structured so that the group feels sufficiently confident in making commitments.

Built into the different PSMs are features whose purpose is to enable participants to distance themselves from previous bindings during the PSM process, effectively

providing them with a certain degree of ambiguity or ‘equivocality’ regarding their own positions (Eden and Ackermann 2004). This, it is argued, allows participants to change their positions in response to what they have learned about the problem situation without destroying the social order in the group (Eden 1992). Changing positions imply individuals ‘changing their minds’, i.e. changed beliefs, changed values and changes in the salience of particular issues or values (Eden 1986). The consequence of this *adaptability* is that it becomes easier for participants to reconcile the position they eventually take both with principles and with past words and actions during a PSM process.

Most PSMs are organised into stages or modes and thus are *phased*. This ‘phased-ness’ makes it possible for the users of the method to conclude without passing through all the modes that compose it, and still have a visible product which can be of use to them. Furthermore, the phases of the different PSMs do not have to be followed in a linear sequence. Instead, PSMs tend to operate in a *non-linear* fashion which makes it possible for the participants to cycle between the phases. As Eden (1992).argues, the characteristic non-linearity of the PSM process is a direct consequence of acknowledging that participants in a group decision making process will consider the practicality of possible actions at the same time as the problem is formulated.

3.2 PSM technology

The technology available with PSMs is essentially *model-based*. Modelling is the defining characteristic of these methods which gives them their unambiguous

management science identity. This distinguishes them from, for example, other modes of group working such as 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 .

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. 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 problems (Checkland 1981;Eden et al. 1983).

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* (i.e. easy to understand) and *accessible* (i.e. simple to use).

Indeed, these attributes of transparency and accessibility have made it possible for some PSM scholars to promote PSMs as *low technology* approaches. This characteristic is 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 conducted in a workshop format, and one which does not necessarily require software to support it (Ackermann and Eden 1994). Some PSMs do, however, use software to support their modelling processes, which allows them to operate as 'group decision support systems' (Ackermann 1990;Eden 1992;Phillips 1989).

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 cause and effect relationships, PSM models are thought to help participants to 'look beneath the surface' to establish problem structure.

As Rosenhead and Mingers (2001) point out, the purpose of PSMs is not to identify a single optimal solution. This means that the entire 'solution space' is in principle of interest during the PSM modelling activity. However, because the set of all possible solutions would be unmanageable large, PSM models limit their scope at any time to a set of *discrete 'solutions'* or *options* for action selected using different screening procedures (e.g. by filtering out internal incompatibilities between options or eliminating them through dominance; by using thresholds of acceptable performance;

by bundling into coherent packages representing contrasting priorities, etc.) (Rosenhead and Mingers 2001). By concentrating on a few significant discrete options (which may change during the analysis), PSMs models seek to help participants to handle the systemic complexity of their problem situation.

Several products have been claimed to be the result of the use by groups of PSMs processes and technology. Some of these products will be tangible outcomes of the PSM process, whilst others will be less visible but valuable in their own right (Friend and Hickling 2005). The intended products of PSMs are discussed in the following section.

3.3 PSM products

The most visible PSM product is obviously the model built during the PSM process and which contains the *problem structure*. The PSM model acts as a 'transitional object' (De Geus 1988) or 'negotiative device' (Eden 1988), and is thought to facilitate the achievement of a number of invisible products. First, it is argued that by allowing the mutual exploration of the problem structure as portrayed by the model, PSMs enable the *accommodation of multiple and differing positions* (Checkland 1981; 1996; 2001). The argument is based on the notion that situations characterised by complexity, uncertainty and conflict will commonly require participants to adjust their positions and/or expectations to take into consideration the possible objectives and strategies of others (Rosenhead 1996;Rosenhead and Mingers 2001). Accommodations between actors may also require coalition forming (Eden 1986,

1996;Eden and Ackerman 2001), which may produce a *shift in power relations* during the PSM process (Eden 1992).

Second, the analysis of cause and effects relationships embedded in the PSM model is thought to give participants an *increased understanding* of the problem situation, of organisational processes and cultures, and of others' beliefs and values. Such increased understanding is taken to be conducive to *learning* (Checkland 1981, 1999;Eden and Ackermann 1998;Friend and Hickling 1997), Third, it is argued that actors' active participation in the analysis and modelling process produces strong *ownership* of the problem formulation, and of the actions to be taken, as well as acceptance of responsibility for the consequences of the actions taken (Rosenhead 1996;Rosenhead and Mingers 2001).

A visible PSM product which, it is argued, results from the accommodations, increased understanding, and ownership achieved during the PSM process takes the form of a set of *partial commitments*, and which are usually expressed as an action plan or 'commitment package' (Friend and Hickling 2005). Action plans can contain a mix of espoused or recommended decisions, policies or research explorations, and may or may not include supporting argumentation derived from the PSM model. The development of partial commitments is based on the notion that the only way to make progress in swamp conditions is by adopting an incremental approach and thus working on a less comprehensive solution (Eden and Ackermann 1998;Friend 2001;Rosenhead and Mingers 2001).

What have been described in the preceding sections are the typical characteristics of the family of PSMs as a whole, though individual methods may vary with respect to these in certain respects. Most of what has been reported about PSMs has focused on actors working within single organisations. It is not clear, however, how well these experiences will transfer to actors working collaboratively between and across organisations. It has been argued earlier that the contextual characteristics of problem domains faced by prospective collaborators broadly correspond to those for which PSMs were specifically designed. Indeed, published studies on the use of PSMs with collaborative groups are increasing (Bryant 2003;Eden 1996;Eden and Huxham 2001;Huxham 1991;Huxham 1996;Taket and White 2000). However, no theoretical arguments justifying the appropriateness of PSMs in this context have been advanced so far. It is argued here that the potential role for PSMs in a collaboration process is principally in relation to facilitating the emergence of shared meaning.

As stated earlier, the creation of shared meaning is essentially a problem structuring activity which can be subject to the different interests and intentions of domain actors. Rationales for PSMs have not included any role for the concept of shared meaning. Nevertheless, it can be argued that the claims that have been made for PSMs do imply the creation of shared meaning as an intermediate step to the achievement of other PSM products such as ownership of the problem structure and the development of partial commitments. Furthermore, from the preceding discussion of PSMs, it has been observed that one of their characteristic features is the development of a model representing alternative versions of the problematic situation of common interest. A PSM model is an explicit shared representation that captures the networks of concepts used by actors to describe the problem domain. The model is then used to help actors

arrive at an agreed shared definition of the problem situation, and achieve joint agreements for coordinated action (Rosenhead and Mingers 2001), both of which can be indicative of shared meaning (Donnellon et al. 1986). Furthermore, the processes and settings used for PSM activity are intended to express their participatory nature, providing a collaborative mechanism that allows actors to create of shared meanings and reach mutual accommodations, and at the same time an arena for the containment of what would otherwise be seen as bold attempts at manipulating the meaning creation process.

To illustrate the potential of PSM for collaboration, a case study drawn from a larger action research program 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 multi-organisational partnering (for further details of the action research programme on which this study is based see Cushman 2001)

4 Methodology

The research reported here was carried out during 1997-1999 in a major company (HOTELCO – a pseudonym) operating in the UK leisure sector. At the time of the research, HOTELCO were engaged in a series of refurbishment projects of their hotels to meet the standards of their recently acquired American four-star hotel franchise, as well as in building new hotels. This construction work was taking place within a then recently established collaborative partnership between HOTELCO and their major contractors and subcontractors, led by HOTELCO. 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).

Partnering arrangements in the UK construction industry are typically led by individual construction clients, drawn from that restricted group of clients who have a consistent flow of construction work on buildings or facilities to be used for their own business rather than for selling or 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. As a result clients of this kind have an incentive to make the cultural shift from single project tendering to partnering, with the implied re-focusing from lowest cost to a cost/quality balance. HOTELCO were new to the partnership concept, but many of their partners had experienced some form of partnering elsewhere. The HOTELCO partners' experience of partnering, however, was based on informal rather than formal partnering relations.

4.1 The problem domain

The HOTELCO partnership was entered with great expectations by the partners. For HOTELCO, partnering was seen as a way to reduce uncertainty about the product. HOTELCO 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. The HOTELCO 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 HOTELCO partners wished to obtain a fair remuneration from what they saw was the real ‘value’ of their work. These expectations entailed certain obligations on the part of the HOTELCO partners. Specifically, they had to be open and honest with HOTELCO 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, HOTELCO 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 HOTELCO and their partners extremely difficult.

A related issue was that of organizational interfaces. At the operational level, the main interface between HOTELCO and their partners was the construction project teams. These teams would have regular meetings to review project progress. At the more strategic level, HOTELCO 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.

Overall, the partners' high expectations, the ill-definition of the joint task and of roles and responsibilities, and the lack of cross-organisational interfaces, comprised a set of initial conditions which had a significant impact on the nature of the subsequent interactions between all partners, and on their learning about the partnership. First, the different partnership teams entered their projects with very broad project specifications. This meant that critical aspects of the project task such as, for example, bedroom model documents, were ill-defined and kept changing throughout the projects.

Second, the partnership interface did not allow for interdependencies to be adequately managed between the partners. Reducing the chances of unclear and changing project specifications would have required the involvement of all partners at the briefing stage of a project. However, the HOTELCO partners did not have any involvement during this stage. Instead, HOTELCO had their own HOTELCO-only design committee in charge of decisions about design both as it related to the franchiser and to the products which were to be sold in the market (e.g. a hotel bedroom, a hotel restaurant, etc.). Indeed, the relationship with the franchiser was still, at the time of the research intervention, an evolving one.

As the relationship between franchiser and franchisee was a new and evolving one, HOTELCO were having difficulties in understanding the requirements of the former, which meant that they were unable to sign off their designs and send the relevant information to their partners on a timely basis. In other words, HOTELCO were too far apart in their ways of doing things to understand their partners' needs and connect to and communicate with their partners effectively.

The problems caused by ill-defined and changing project specifications were exacerbated by the lack of a clear definition of partnership roles and responsibilities. Early in the partnership it became apparent that some aspects of the partnership arrangements were causing difficulties to the partners. For example, in the initial partnership set-up, architects and designers were subcontracted by the partner contractors. This meant that both architects and designers had limited flexibility to operate and respond to HOTELCO's demands, which caused much frustration to all parties. In addition, in the initial partnership set-up the contractors had the responsibility to manage HOTELCO's preferred suppliers (called 'directs'), but the latter's payment came from HOTELCO. This meant that the contractors had little power to manage third party performance which significantly affected the contractor's responsiveness to the demands of HOTELCO.

Third, expectations between the partners suffered. Each partner entered the partnership with a set of explicit expectations. Some of these expectations stemmed from the industry context they entered the partnership from. Each partner also had expectations about the behaviours of the other partners, and used their interactions with each other as a way to gather clues to validate or challenge initial expectations. For example, partner contractors started to raise concerns about HOTELCO's inability to recognize the efforts over the projects in agreeing the level of return achieved by the contractors.

Fourth, as their interactions unfolded and the partners became aware of discrepancies from expected processes, the partners learned about each other, and about each others'

organizational routines. In the case of the HOTELCO partners, as they discovered the demands of the project tasks and HOTELCO's ways of working, they questioned HOTELCO's ability to work sufficiently closely with them to perform the project tasks successfully.

In summary, the ill-definition and changing nature of the project task, the lack of clear partnership roles and responsibilities, together with the slow and inefficient response by HOTELCO to the need of their partners for effective coordination led to mixed evaluations of the partnership relationship, and to a recognition of the need for jointly reviewing both the projects and the partnership process.

4.2 The PSM intervention

A formal reviewing mechanism for construction projects was developed and implemented within the HOTELCO partnership. The developed methodology was based on the Strategic Choice Approach (SCA) (Friend and Hickling 2005), a particular problem structuring method, and designed both to focus on the key issues faced by members of a construction project team, and as the basis for a generic project review processes. Table 2 provides a summary description of SCA, with accompanying focus, stages, modelling approach and general purpose.

INSERT TABLE 2 ABOUT HERE

The SCA-based methodology was used by three construction teams, drawn from the HOTELCO partnership, to carry out a post-completion review of their projects. The

three SCA workshops involved the post-completion review of two re-development projects and a design and build project. Each of the workshops comprised seven to nine participants representing a variety of stakeholders including the client's property division and operational management, the main 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 HOTELCO was involved in more than one workshop.

All workshops were held at, or close to, the project site and carried out in a 5-hour session. 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. In addition, it was agreed that a HOTELCO representative (an experienced facilitator well known to HOTELCO and their partners) member was going to facilitate the workshops with the assistance of the researcher. The rationale for this decision was based on ensuring the facilitator was seen as 'legitimate' by workshop participants (Gray 1989;Huxham 1991).

4.3 Data collection and analysis

The main source of data for the study reported here comprised the records from the PSM workshops; and transcripts from tape-recorded, semi-structured interviews carried out with the study participants. The focus of the interviews was on trying to understand as fully as possible participants' perceptions of the usefulness of the SCA-

based methodology, as well as the events within and around the HOTELCO partnership and the perceptions of the participants about these events. All this information provided a rich data base with which to examine the impact of the PSM methodology within the HOTELCO partnership. Table 3 provides an overview of the sources of interview material

INSERT TABLE 3 ABOUT HERE

The approach to the analysis of data adopted in this study was based on 'grounded theory' (Glaser and Strauss 1967;Strauss and Corbin 1998). The potential perceived for generating an understanding of the subjective meanings participants attributed to their experience of using PSMs to support their collaborative activities was the main motivation for its adoption in this exploratory study. The grounded theory approach offers a way of analyzing 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). Table 4 provides a summary of the categories and sub-categories derived from the data analysis.

INSERT TABLE 4 ABOUT HERE

The coding and categorising process was facilitated by the use of *Atlas.ti* (Muhr 1997). The software not only allowed complex coding of the data, but also facilitated

the manipulation and management of coded statements for further analysis. Transcripts were first entered into a word processor, converted into text files, and then entered into *Atlast.ti*. The software's search procedures allowed the easy location of all the occurrences of a particular code, set of codes or categories and retrieve them with corresponding original text segments. It also allowed the recording of 'research memos' which were electronically linked to codes or text segments, as well as their retrieval separately or together with text segments. By using multiple code searches it was possible to analyse and confirm previously discovered patterns, which served as a form of reliability assessment on the foregoing analyses.

5 Results and discussion

A number of themes emerged from the analysis of the data. First, workshop participants expressed the unanimous view that SCA was a transparent mechanism which helped them to understand each other, and to structure, clarify and learn about the issues confronting them. This was because they were able to share and cross-pollinate their different perspectives, identify and understand the relationships between the different issues and areas for choice, and obtain a broader picture of the problems confronting the partnership. Most participants described the representation, structuring and prioritization of the issues as transparent, flexible, and efficient,

Second, all participants stated that SCA allowed them to openly discuss and jointly examine the issues affecting them, and that it was the openness forced upon participants by SCA 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 SCA discussion format made them felt comfortable to become involved and express their views freely. In addition, they observed their views being taken into account and adding to the richness of the discussions.

Finally, those participants whose role within the HOTELCO partnership was strategic rather than operational (i.e. those who were not part of the project teams dealing with the day-to-day management of the projects) indicated that they had learned both from each other and from the projects, and that this learning was a key trigger for the actions that followed. The following examples illustrate the extent to which the learning achieved with SCA was disseminated to other projects within the partnership. A £4.6 million, 64-bedroom extension at a HOTELCO hotel in Edinburgh was planned to start in January 1999. Participating in this project were HOTELCO and one of their major contractors, who had taken part in one of the SCA workshops. Interviewed by the researcher, representatives of both organizations expressed that what they had learned at the SCA workshop review was subsequently applied to the planning of this new project, even though there were no specific actions for the new project resulting from the review. Moreover, the same SCA workshop format used in the reviews was again used at a phased review of a new HOTELCO hotel in Glasgow, and facilitated by the HOTELCO representative who had participated in one of the

SCA reviews. This occurred without any prompting or supervision from the researcher. These examples illustrate that the partners had a strong ownership of the processes and products of the SCA intervention, saw the method's usefulness, and applied what they had learned.

Following each of the three SCA reviewing workshops, adjustments in the partnership relationship ensued. An emerging theme identified in the data suggests that after the SCA-supported reviews HOTELCO and their partners had developed heightened expectations. The evidence suggests that the reviewing mechanism appear to have contributed to a significant change in the nature of the partners' relations. In particular there is some evidence in the study that SCA may have contributed to facilitating mutual accommodations and high levels of commitment to the partnering relationship. This is particularly significant, given the asymmetrical nature of the relationship between HOTELCO and their partners, which was evident from the early stages of the partnership. HOTELCO 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 study was whether the application of SCA would only help to legitimise HOTELCO's intentions rather than support genuine accommodations between the parties.

After each of the SCA workshops, HOTELCO and their partners knew what they wanted to do and had clear ideas about how to do it. The adjustments which took place among the partners during the period of the study included the development of new communication interfaces for the partners (e.g. partners were to sit on project reviews and meetings other than those in which they were directly involved); the

empowering of contractors in relation to HOTELCO's suppliers (e.g. by withholding payment of suppliers until the contractors were satisfied with their performance); a tighter definition of briefing documents (e.g. hotel bedroom models were developed and became available to HOTELCO partners); and the development of a new project management process for all partners with SCA as a key element.

A follow-up conversation with HOTELCO's property development manager confirmed that, two years after the completion of the research, SCA continued to be used within the partnership as part of its standard project review procedures. SCA became part of the process manual which every project manager should follow, and HOTELCO extended its use from their four-star hotel projects where it was piloted during the research to their much larger program of renovations for their budget hotel chain.

To summarize, the following evaluation themes regarding the SCA-based intervention were derived from the analysis: effective problem structuring process, highly participatory process; high supportability and ownership of workshop commitments; and learning. Overall, the evidence suggests that the high level of commitment to the joint agreements reached by the partners, and their subsequent implementation can be interpreted as indicative of the creation of shared meaning about both the issues constituting the problem domain within the HOTELCO partnership, and the steps needed to address them.

6 Conclusions

This paper has argued that PSMs can be potentially useful in facilitating effective multi-organisational collaboration. To illustrate their potential, this paper has presented the findings of an exploratory investigation into the suitability and impact of a PSM in a multi-organisational partnership operating within the UK construction industry. SCA served as a reviewing mechanism aimed at helping collaborators re-negotiate their relations in order to adjust their future interactions, and in collating and integrating their learning about the partnership. SCA generated this effect through a transparent, highly participatory and effective problem structuring process.

The study experience as a whole tends to demonstrate that shared meaning about the problem domain did emerge as a result of SCA. Participants expressed the view that the work carried out with SCA helped them improve their understanding of the barriers and difficulties affecting both the partnership and the partners, and to have clearer views of their options for actions. Some of these options relied on HOTELCO's decisions, and HOTELCO showed strong commitment to their implementation during and after the workshops. In addition, the study findings seem to indicate that PSMs in general, and SCA in particular, have the potential to increase collaborators' awareness of the advantages of mutual accommodations.

The findings from the experience of applying SCA within the HOTELCO partnership have supported the proposition that there is indeed scope for the use of PSMs for multi-organisational collaboration, and that these methods do appear to have a positive role in assisting developmental processes of inter-organisational relations (Buchel 2000;Doz 1996;Ring and Van de Ven 1994). The study findings also suggest that PSMs can be a significant vehicle in facilitating inter-organisational learning

between organisations, which is considered a key element for the sustainability of multi-organisational collaborations (Doz 1996;Holmqvist 2003;Kumar and Nti 1998).

Some potentially valuable possibilities for further research which have surfaced during this study can be formulated. First, the collaboration studied in this paper is in many ways unique because it operated within a partnership context. Given the positive effects reported from the application of SCA with this particular type of collaboration, the possibility that SCA could have similar effects with other types of collaborations (within or outside construction) clearly deserves further investigation.

Second, the intervention reported in this paper covered the use of SCA, a particular problem structuring method. SCA 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.

In this paper, collaboration was conceptualised as a process through which shared meaning is created. However, meaning creation is a complex phenomenon taken to encompass multiple dimensions (e.g. Donnellon et al. 1986;Eisenberg 1984;Weick 1979), which may explain why it is possible for actors to share some aspects of meaning and not others, and still make progress towards coordinated action (Fiol 1994). Therefore, additional research in this area will help to better understand the nature of meaning creation during collaboration, as well as the impact of PSMs on the meaning creation process. Research strategies which pay attention to the analysis of

'live' conversations (Atkinson and Heritage 1984;Psathas 1995;Ten Have 1999) during collaboration would be useful for this purpose

Finally, the study findings also have important practical implications for actors attempting to develop effective multi-organisational collaboration. The role and influence of the convener or facilitator of collaborations has been widely acknowledged (e.g. Gray 1989;Huxham 1991). In the study reported in this paper the facilitator, 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 for collaboration. This suggests the issue of transferability of PSMs craft skills as an important topic for empirically-based research.

References

Ackermann, F. (1990) The Role of Computers in Group Decision Support. In Eden, C. & Radford, J. (Eds.) *Tackling Strategic Problems: the role of group decision support.* London, Sage.

Ackermann, F. (1996) Participant's Perceptions on the Role of Facilitators Using Group Decision Support Systems. *Group Decision and Negotiation,* 5**,** 93-112.

Ackermann, F. & Eden, C. (1994) Issues in Computer and Non-computer Supported GDSSs. *Decision Support Systems,* 12**,** 381-390.

Atkinson, J. M. & Heritage, J. (1984) *Structures of Social Action: studies in conversation analysis,* Cambridge, Cambridge University Press.

Barringer, B. R. & Harrison, J. S. (2000) Walking a Tightrope: creating value through interorganizational relationships. *Journal of Management,* 26**,** 367-403.

Berger, P. L. & Luckmann, T. (1966) *The Social Construction of Reality: a treatise in the sociology of knowledge,* New York, Doubleday.

Bryant, J. (2003) *The Six Dilemmas of Collaboration,* Chichester, Wiley.

Buchel, B. (2000) Framework of Joint Venture Development: theory-building through qualitative research. *Journal of Management Studies,* 37**,** 637-661.

Carpenter, S. & Kennedy, W. (1988) *Managing Public Dispute: a practical guide to handling conflict and reaching agreements,* San Francisco, Jossey-Bass.

Checkland, P. (1981) *Systems Thinking, Systems Practice,* Chichester, Wiley.

Checkland, P. (1999) *Soft Systems Methodology: a 30-year retrospective,* Chichester, Wiley.

Checkland, P. & Scholes, J. (1990) *Soft Systems Methodology in Action,* Chichester, Wiley.
Cushman, M. (2001) Action Research in the UK Construction Industry: the B-Hive Project. *IFIP WG 8.2 Working Conference on Realigning Research and Practice in Information Systems Development.* Boise, Idaho.
Das, S., Sen, P. & Sengupta, S. (1998) Impact of Strategic Alliances on Firm Valuation. *Academy of Management Journal,* 41**,** 27-41.
De Geus, A. (1988) Planning as Learning. *Harvard Business Review,* 66**,** 70-74.
Dickson, P. & Weaver, K. (1997) Environmental Determinants and Individual-level Moderators of Alliance Use. *Academy of Management Journal,* 40**,** 404-425.
Donnellon, A., Gray, B. & Bougon, M. G. (1986) Communication, Meaning, and Organized Action. *Administrative Science Quarterly,* 31**,** 43-55.
Doz, Y. (1996) The Evolution of Cooperation in Strategic Alliances: initial conditions or learning processes? *Strategic Management Journal,* 17**,** 55-83.
Doz, Y. & Hamel, G. (1998) *Alliance Advantage,* Boston, Harvard Business School Press.
Dutton, J. & Duncan, R. (1987) The Creation of Momentum for Change Through the Process of Strategic Issue Diagnosis. *Strategic Management Journal,,* 8**,** 279-295.
Eden, C. (1986) Problem Solving or Problem Finishing. In Jackson, M. & Keys, P. (Eds.) *New Directions in Management Science.* Aldershot, Gower.
Eden, C. (1988) Cognitive Mapping: a review. *European Journal of Operational Research,* 36**,** 1-13.
Eden, C. (1990) Managing the Environment as a Means to Managing Complexity. In Eden, C. & Radford, J. (Eds.) *Tackling Strategic Problems: the role of group decision support.* London, Sage.
Eden, C. (1992) A Framework for Thinking About Group Decision Support Systems. *Group Decision and Negotiation,* 1**,** 199-218.
Eden, C. (1996) The Stakeholder/Collaborator Strategy Workshop. In Huxham, C. (Ed.) *Collaborative Advantage.* London, Sage.
Eden, C. & Ackerman, F. (2001) SODA: the principles. In Rosenhead, J. & Mingers, J. (Eds.) *Rational Analysis for a Problematic World Revisited: problem structuring methods for complexity, uncertainty and conflict.* Chichester, Wiley.
Eden, C. & Ackermann, F. (1998) *Strategy Making: the journey of strategic planning,* London, Sage.
Eden, C. & Ackermann, F. (2004) Use of 'Soft OR' Models by Clients: what do they want from them? In Pidd, M. (Ed.) *Systems Modelling: theory and practice.* Chichester, Wiley.
Eden, C. & Huxham, C. (2001) The Negotiation of Purpose in Multi-organizational Collaborative Groups. *The Journal of Management Studies,* 38**,** 373-391.
Eden, C., Jones, S. & Sims, D. (1983) *Messing about in problems: an informal structured approach to their identification and management,* Oxford, Pergamon.
Egan, J. (1998) *Re-Thinking Construction: report of the Construction Industry Task Force,* London, DETR.
Eisenberg, E. M. (1984) Ambiguity as Strategy in Organizational Communication. *Communication Monographs,* 51**,** 227-242.
Fiol, C. M. (1994) Consensus, Diversity, and Learning in Organizations. *Organization Science,* 5**,** 403-420.

Ford, J. D. & Ford, L. W. (1995) The Role of Conversations in Producing Intentional Change in Organizations. *Academy of Management Review,* 20**,** 541-570.

Franco, L. A. (2006) Forms of Conversation and Problem Structuring Methods: a conceptual development. *Journal of the Operational Research Society***,** (forthcoming).

Friend, J. (2001) The Strategic Choice Approach. In Rosenhead, J. & Mingers, J. (Eds.) *Rational Analysis for a Problematic World Revisited: problem structuring methods for complexity, uncertainty and conflict.* Chichester, Wiley.

Friend, J. & Hickling, A. (1997) *Planning Under Pressure: the strategic choice approach*, Oxford, Butterworth- Heinemann.

Friend, J. & Hickling, A. (2005) *Planning Under Pressure: the strategic choice approach*, Elsevier.

Glaser, B. & Strauss, A. (1967) *The Discovery of Grounded Theory,* Chicago, Aldine.

Gray, B. (1989) *Collaborating: finding common ground for multiparty problems,* San Francisco, Jossey-Bass.

Gray, B. (2000) Assessing Inter-Organizational Collaboration: multiple conceptions and multiple methods. In Faulkner, D. & De Rond, M. (Eds.) *Cooperative Strategy: economic, business and organizational issues.* Oxford, Oxford University Press.

Hardy, C., Lawrence, T. & Grant, D. (2005) Discourse and Collaboration: the role of conversations and collective identity. *Academy of Management Review,* 30**,** 58-77.

Hardy, C. & Phillips, N. (1998) Strategies of Engagement: lessons from the critical examination of collaboration and conflict in an interorganizational domain. *Organization Science,* 9**,** 217-230.

Hardy, C., Phillips, N. & Lawrence, T. (1998) Distinguishing Trust and Power in Interorganizational Relations: forms and facades of trust. In Lane, C. & Bachmann, R. (Eds.) *Trust Within and Between Organizations: conceptual issues and empirical applications.* Oxford, Oxford University Press.

Harrigan, K. (1988) Joint Ventures and Competitive Strategy. *Strategic Management Journal,* 9**,** 141-158.

Hickling, A. (1990) 'Decision Spaces': a scenario about designing appropriate rooms for group decision management. In Eden, C. & Radford, J. (Eds.) *Tackling Strategic Problems: the role of group decision support.* London, Sage.

Holmqvist, M. (2003) A Dynamic Model of Intra- and Interorganizational Learning. *Organization Studies,* 24**,** 95-123.

Huxham, C. (1990) On Trivialities in Process. In Eden, C. & Radford, J. (Eds.) *Tackling Strategic Problems: the role of group decision support.* London, Sage.

Huxham, C. (1991) Facilitating Collaboration: issues in multi-organizational group decision support in voluntary, informal collaborative settings. *The Journal of the Operational Research Society,* 42**,** 1037-1045.

Huxham, C. (1996) Group Decision Support for Collaboration. In Huxham, C. (Ed.) *Creating Collaborative Advantage.* London, Sage.

Huxham, C. & Vangen, S. (2005) *Managing to Collaborate: the theory and practice of collaborative advantage,* London, Routledge.

Keller, P. (1981) Interpersonal Dissent and the Ethics of Dialogue. *Communication,* 6**,** 287-303.

Kumar, R. & Nti, K. (1998) Differential Learning and Interaction in Alliance Dynamics: a process and outcome discrepancy model. *Organization Science,* 9**,** 356-367.

Latham, M. (1994) *Constructing the Team: final report of the government/industry review of procurement and contractual arrangements in the UK construction industry,* London, HMSO.

McCann, J. E. (1983) Design Guidelines for Social Problem-Solving Interventions. *The Journal of Applied Behavioral Science,* 19**,** 177-189.

Muhr, T. (1997) *Atlas.ti: short user's manual,* Berlin, Scientific Software Development.

Nathan, M. & Mitroff, I. (1991) The Use of Negotiated Order Theory as a Tool for the Analysis and Development of an Interorganizational Field. *Journal of Applied Behavioral Science,* 27**,** 163-180.

Osborne, R. & Hagedoorn, J. (1997) The Institutionalization and Evolutionary Dynamics of Interoganizational Alliances and Networks. *Academy of Management Journal,* 40**,** 261-278.

Payne, S. (1991) A Proposal for Corporate Ethical Reform: the ethical dialogue group. *Business and Professional Ethics Journal,* 10**,** 67-88.

Pettigrew, A. (1979) On Studying Organizational Cultures. *Administrative Science Quarterly,* 24**,** 570-581.

Phillips, L. (1984) A Theory of Requisite Decision Models. *Acta Psychologica,* 56**,** 29-48.

Phillips, L. (1989) People-centred Group Decision Support. In Doukidis, G., Land, F. & Miller, G. (Eds.) *Knowledge-based Management Support Systems.* Chichester, Ellis-Horwood.

Phillips, L. & Phillips, M. (1993) Facilitated Work Groups: Theory and Practice. *Journal of Operational Research Society,* 44**,** 533-549.

Psathas, G. (1995) *Conversation Analysis: the study of talk in interaction,* London, Sage.

Quade, E. (1980) Pitfalls in Formulation and Modelling. In Majone, G. & Quade, E. (Eds.) *Pitfalls of Analysis.* Chichester, Wiley.

Ring, P. S. & Van de Ven, A. H. (1994) Developmental Processes of Cooperative Interorganizational Relations. *Academy of Management Review,* 19**,** 90-118.

Rosenhead, J. (1996) What's the Problem? An Introduction to Problem Structuring Methods. *Interfaces,* 29**,** 117-131.

Rosenhead, J. & Mingers, J. (Eds.) (2001) *Rational Analysis for a Problematic World Revisited: problem structuring methods for complexity, uncertainty and conflict,* Chichester, Wiley.

Rothwell, W. J. & Sullivan, R. L. (2005) *Practicing Organization Development: a guide for consultants,* San Francisco, CA, Pfeiffer Wiley.

Saxton, T. (1997) The Effects of Partner and Relationship Characteristics on Alliance Outcomes. *Academy of Management Journal,* 40**,** 443-461.

Schein, E. H. (1998) *Process Consultation Revisited: building the helping relationship,* Addison Wesley.

Smircich, L. & Morgan, G. (1982) Leadership: the management of meaning. *Journal of Applied Behavioral Science,* 18**,** 257-273.

Strauss, A. & Corbin, J. (1998) *Basics of Qualitative Research: techniques and procedures for developing grounded theory,* London, Sage.

Taket, A. & White, L. (2000) *Partnership and Participation: decision-making in the multi-agency setting,* Chichester, Wiley.

Ten Have, P. (1999) *Doing Conversation Analysis: a practical guide,* London, Sage.
Trist, E. (1983) Referent Organizations and the Development of Interorganizational Domains. *Human Relations,* 36**,** 269-284.
Turner, B. (1983) The Use of Grounded Theory for the Qualitative Analysis of Organizational Behaviour. *Journal of Management Studies,* 20**,** 333-348.
Vansina, L. & Taillieu, T. (1997) Diversity in Collaborative Task-Systems. *European Journal of Work and Organizational Psychology,* 6**,** 183-199.
Vaughan, E. & Siefert, M. (1992) Variability in the Framing of Risk Issues. *Journal of Social Issues,* 48**,** 119-135.
Weick, K. E. (1979) *The Social Psychology of Organizing,* New York, McGraw-Hill.
Westley, F. R. & Vredenburg, H. (1991) Strategic Bridging: the collaboration between environmentalists and business in the marketing of green products. *Journal of Applied Behavioral Science,* 27**,** 65-90.
Wood, D. & Gray, B. (1991) Toward a Comprehensive Theory of Collaboration. *The Journal of Applied Behavioral Science,* 27**,** 139.

Table 1: PSM processes, technology and products
- based on Rosenhead and Mingers (2001)

PSM process	Group-based. Facilitated. Participative. Interactive. Iterative. Adaptable. Phased. Non-linear.
PSM technology	Model-based. Requisite. Diagrammatic/language-based. Reduced quantitative data requirements. Transparent/accessible. Low technology. Analysis of cause and effect relationships. Analysis of significant discrete options.
PSM products	Problem structure. Increased understanding. Accommodations of multiple positions and in power relations. Ownership of problem structure and of consequence of planned actions. Partial commitments. Learning.

Table 2: The Strategic Choice Approach (SCA)
- based on Friend and Hickling (2005)

Focus	Stages	Purpose	Modelling
Recognition of key uncertainties influencing a set of interconnected choices, and the management of commitments.	*Shaping:* identification of areas of choice and decision focus. *Designing*: development of feasible portfolios for action. *Comparing*: advantage comparison of attractive portfolios. *Choosing*: development of a 'progress package' which contains commitments that can be taken now, and explorations to manage uncertainties about the environment, guiding values and related agendas.	Make incremental progress by committing to a set of priority decisions, explorations and contingency plans.	Decision graphs and option graphs are used to develop a feasible set of interconnected options, which are then evaluated against a set of comparison areas which bring key uncertainties to the surface.

Table 3: Overview of the interview material

PSM workshop	No of PSM workshop participants	No of recorded interviews
1	8	4 individual interviews; 1 group interview (with three participants).
2	8	7 individual interviews.
3	9	6 individual interviews.

Table 4: Summary of categories and sub-categories derived from the data analysis

Starting conditions	*Interacting*	*Negotiating*	*Adjusting*
Expectations	Changing brief	Reviewing	Adjusting expectation
Task definition	Communications	Structuring	Adjusting relationships
Interfaces	Evaluation	Transparency	Adjusting interfaces
		Participation	Re-defining tasks
		Openness	
		Cross-pollination	
		Understanding	
		Learning	
		Ownership	
		Room-layout	