

The value paradox of Problem Structuring Methods

Patrick Tully¹, Leroy White², Michael Yearworth³

¹ Systems Centre, Faculty of Engineering, University of Bristol, BS8 1TR. UK

² Warwick Business School, University of Warwick, CV4 8UW. UK

³ Business School, University of Exeter, EX4 4ST. UK

Abstract

The use of Problem Structuring Method (PSM) interventions leads to outcomes unique to the circumstances of the problem context. Given the singular nature of these outcomes a consultant attempting to sell a PSM intervention will struggle to articulate value to clients in terms that are commercially meaningful *prior* to the intervention being enacted. Thus, in order to win a contract to deliver a PSM intervention the consultant must first resolve this puzzle. We explore this question by i) reviewing how the value of PSMs has been assessed previously, ii) setting out a suitable theoretical position to explore the problem, and iii) presenting empirical data from a commercial organisation to build our theoretical position. This starts with agreement with Checkland and Scholes that attempting to sell the (financial) value of a PSM intervention *a priori* is unlikely to ever succeed. Our theoretical development through analysis of empirical data leads to the recognition that the *process of selling* a PSM intervention is bound to the interposition of the processes of problematization and interessement and the issue of trust. The recognition of a distinction between these and the actual enactment of a PSM intervention leads us to conclude that the process of selling the consulting engagement is entirely associated with the temporal ordering between them. We thus avoid the bind of the original puzzle only by articulating a paradox. To resolve the paradox, we shift analytical focus to the *pre-contractual phase* of the relationship between a consultant and client and discuss implications of this paradox for Soft OR practice.

Keywords: OR Practice; Soft OR; Problem Structuring Methods; Actor Network Theory

1 Introduction

While working with consulting organisations the authors see many examples of problem situations where the delivery of a Problem Structuring Method (PSM) intervention would be appropriate but find it difficult to sell such methods to clients. We question whether this is an inability to articulate the value of PSM interventions in the sales process, and go on to explore the logic of equating value to the ability to sell. This extant issue has had a long debate in the OR literature, stemming from early concerns about practice and engagement (Eden, 1989, 1992; Eden & Sims, 1979; Friend, Bryant, Cunningham, & Luckman, 1998; Kirby & Capey, 1998; Tomlinson, 1998), the relation of OR to consulting (Fildes & Ranyard, 2000; Fildes & Ranyard, 1997), through to recent review of the situation (Ackermann, 2012; Eden & Ackermann, 2006; Ormerod, 2014) and OR as negotiation (Eden, 1982; Friend & Hickling, 2005). Here, we respond to calls for a deeper understanding of how PSM interventions are experienced and enacted in situ. Indeed, this call is to address the question from a practice perspective, which focuses on the activities of individuals as part of the ordinary, everyday nature of PSM work.

OR research and practice is largely guided by the foundational arguments of positive agency theory (Eden & Sims, 1979), and thus has been most concerned with describing the mechanisms that solve the agency problem. That is, the concern is with how to persuade executives of organizations to run firms for objective benefits. A host of mechanisms and processes have been posited to effectively mitigate the agency problem (Fildes & Ranyard, 2000). However, existing evidence on the effectiveness of such mechanisms is not encouraging. Indeed, Eden and Sims (1979, p. 119) argued that we “*need to find ways of taking account of personal and illegitimate features of a client's understanding of his situation*”. They suggest the focus should be on the *practice* of OR in ways that reflect a project's political complexity and that OR researchers and practitioners should devote some energy to reflecting upon the processes used in effective problem structuring.

In our work, we directly answer these calls and take a holistic approach to the study of selling OR services from a practice perspective and conduct an analysis of empirical data from a commercial organisation to explore these ideas. We ground our work in a realist perspective on evaluation (Pawson & Tilley, 1997) and with a theoretical focus on Actor Network Theory (ANT) (Callon, 1986; Latour, 1987) underpinning a performative view of OR practice (Ormerod, 2014; Pickering, 1993, 1995).

In the next section, we present a review of the PSM literature assessing the current state of knowledge about measuring the ‘value’ of PSMs. We then proceed to set out our initial position on theory relevant to the question. The remainder of the paper unfolds as a presentation of our empirical data and analysis against theory as we illustrate the value paradox at the heart of Soft OR. This is then discussed in relation to implications for OR practice.

2 Review

We review the PSM literature with a critical eye on the question of measuring or articulating the value that a PSM intervention can deliver to a client. Given that PSM use is usually driven by the existence of a messy problem (Mingers, 2011), the uniqueness of the situation and specificity of the outcomes renders any sort of controlled measurement of the value of an intervention in itself problematic and practically tautological. Checkland and Scholes (1999, p. 299) state that due to the single intervention nature of Soft Systems Methodology (SSM) it is not possible to measure, in any meaningful sense, the impact of the methodology. They go on to argue that SSM can be shown to be valid through its sound base in theory and philosophy, but they went to some lengths to dissuade practitioners from thoughts of trying to measure its value. In effect, they treated this as a type of *category error* by stating that the “*does it work question*” is “*undecidable*”.

Despite the existence of this *undecidability* problem this has not completely disabled the practice of PSM interventions in a commercial setting. In fact, it is well understood that PSMs have been used successfully in commercial applications for some time and there is a rich record of this (e.g. (Howick & Ackermann, 2011; Mingers, 2011; Mingers & Rosenhead, 2004; Mingers & White, 2010; Ormerod, 2016)). However, much less has been written to understand how the value of such methods can be articulated as part of the process of *selling* a PSM intervention to customers.

Mingers (2011) demonstrated the efficacy of Soft OR methods summarising evidence from three review papers (Mingers & Munro, 2002; Mingers & Taylor, 1992; van de Water, Schinkel, & Rozier, 2007) whereby surveys of participants or practitioners had been made post intervention and the results were overwhelmingly positive. Mingers’ definition of “*success*” itself is to be noted, stating that success is the generation of *agreement* amongst the users of a Soft OR method that particular courses of action should be taken. Howick and Ackermann (2011) undertook a review of 30 papers which were all mixed method OR applications, 24 of which included some form of known, specific PSM, and in addition to a number of other factors looked at client value. They found client value to be “*thinly addressed*” within the majority of papers, with a small number suggesting that value could be added through the generation of useable products throughout the interventions. A small number of the papers reviewed discussed negative value; generally focusing on cost, time and uncertainty of outcome (*ibid*).

Current theoretical focus has been on viewing the PSM intervention at either the macro (whole intervention) (Ackermann & Eden, 2011) or micro level (currently focussed on Behavioural OR) (Franco, 2006; Franco & Hämäläinen, 2016; Franco & Rouwette, 2011; White, Yearworth, & Burger, 2015). These studies have focused on individual case studies of PSM interventions, and while they provide important lessons in how single case studies can be better understood, and thus PSMs developed further, they do little to demonstrate the overall value of PSMs.

Two special issues on PSMs in the Journal of the Operational Research Society edited by Shaw, Franco, and Westcombe (2006) and Franco, Shaw, and Westcombe (2007) collected together contributions, as viewpoints as well as original research articles, from a number of experts in PSMs in one of those periodic reflections on the current state of a discipline. The viewpoint piece from Morrill (2007) appeared in the second special issue and provided the initial motivating question for our work. She asked directly “*Are the benefits of PSMs being sold sufficiently?*” Morrill presented a number of reasons for why this might not be happening, identifying the small graduate pool, limited teaching, small PSM community and lack of buy-in from the wider OR community as key. She argued that the benefits of PSMs needed to be “*sold better*” in order to create a “*bright future*”. Indeed this is something which had also been raised by Checkland (2006), stating that “*It is practitioners who will have a special importance in carrying forward work on PSMs*”.

Shaw (2006, p. 832) devotes a section on the value of PSMs but focuses entirely on a methodological view of value oriented towards the research data needs of the academic OR practitioner. Whilst Winter (2006) demonstrates the value of using PSMs, in this case SSM, in the early stages of project management “*where objectives are often unclear and where different constituencies have conflicting aims*”. The question of what led to the existence of the project is avoided. The project is assumed to exist, and the value of using the PSM is presumed to be realised in the project, *after* the process of selling. Overall, where the literature focuses on the value of PSMs at all it is outside of the selling process, concentrating on where the perceived value resides, i.e. in methodology (Horlick-Jones & Rosenhead, 2006, p. 763), and largely with an academic OR practitioner viewpoint. The latter is not surprising due to the selection effect of academic publishing. However, in their editorial, Shaw et al. (2006) do raise the problem of selling the benefits of PSMs to clients, but their viewpoint is again based on the assumption of value being associated with the PSM intervention itself and thus still trapped in the puzzle posed by Checkland and Scholes (1999). The data they seek to obtain from PSM interventions is more likely to align with an evaluation oriented perspective and again focussed on the needs of the academic OR practitioner.

In setting out a basis for appraising PSM interventions based upon social constructivism and the sociology of scientific knowledge (SSK) White (2009) recognised that “*there are many issues left unresolved relating to their [PSMs] efficacy*”. While this approach provides the researcher with an additional method to analyse and understand a PSM intervention and therefore improve methodology in the future it does not allow the comparison of the benefits of individual PSMs.

More recently, when putting PSMs “*in the dock*” Ackermann (2012), identified that “*new practitioners struggle with explaining the benefits*” of PSMs, but went on to state that once the first step is conquered the client is “*totally bought in*”. She identified this issue as being one regarding the terminology used in presenting PSMs to clients and the lack of their being a “*single right answer*” as the outcome of a PSM intervention. It is clear that both these issues need to be overcome to

successfully deliver PSM interventions in industry. Midgley et al (2013) presented a framework to evaluate the impact of PSMs, both to the individual case study and to allow the effective comparison between methods. They present the need for doing this as “*so little has previously been written on this subject*”. They go on to suggest that the majority of evaluation of participative methods to date has focused on personal reflections of researchers.

We generally support the views of (Midgley et al., 2013; Morrill, 2007; White, 2006), that much more needs to be done to *evaluate* the use PSMs so that the benefits can be better sold to a wider constituency and that PSM research can move beyond purely methodological concerns towards the practical.

However, to address and build on the above points, we need to know more about the practices by which individuals dynamically manage problem structuring demands and their fluctuating salience in their everyday work. We thus introduce a practice perspective, which focuses on the activities of individuals and their experience of the ordinary, everyday nature of PSM interventions (Ormerod, 2010; Ormerod, 2017). This focus complements the pragmatic approaches that currently dominate the literature. It provides a more complete and dynamic understanding of how practices are enacted within the organizational structures they inhabit.

3 Theory

One of the most notable and intriguing recent developments in understanding OR processes is the increased interest in the detailed understanding of how real-time practices are carried out and the relation between OR practices and the organizing process (Franco, 2013; White, 2009; White, Burger, & Yearworth, 2016). While there has always been an interest in the *process* of OR (Keys, 1989, 1998; Keys & Midgley, 2002), there is renewed interest in practice that can thus be interpreted as an attempt to re-ground what is actually done by the OR practitioner in the *doing* of OR, and how those doing it make sense of it in practice. This is in light of the continuing attempt at closing the gap between practice-driven reflections of what OR people do in their practice and academic theory-driven theorising about it. Central to this understanding is the long-standing interest in the idea that practice constitutes the site of organisation and that organisational phenomena transpire through, and are effects of, interconnected practices – a ‘socio-materiality’ (Franco, 2013; White et al., 2016). Thus, the basic concern is “*the pattern of social and material practices of organising ordered across space and time*” (Giddens, 1984, p.2). Thus, to understand OR practices we need to understand the organised activity studied in terms of the methodical practices used by competent members/experts to assemble concerted scenes of action (Llewellyn & Hindmarsh, 2010). The idea behind these approaches is that all social and material practices emerge around an object or prospective outcome

that directs activities, around which activities are coordinated, and in which activities are crystallized when the activities are complete (Kaptelinin & Nardi, 2006).

Recently, White et al. (2015) have built on Pickering's *mangle of practice* (Pickering, 1993, 1995) – following Ormerod (2014) drawing attention to its value in analysing OR cases – as an example of this socio-material-oriented approach focussing attention on the constitutive power of associations. Pickering argued that (social) agency (both individual and collective) is constituted through assembling, aligning and stabilising patterns of relationships so that any form of social order is in fact the outcome of observable instances of that ordering. From this it follows that the main task for researchers is to trace the associations between human and non-human elements and study the effects that the resulting arrangements make in the world. Although strictly speaking the mangle is not entirely one of the theories of practice, it does however offer the potential of a powerful theory/method approach for outlining a practice-based theory of the OR process. Pickering (1993, 1995) developed the mangle as a way to describe the view of scientific practice as “*an evolving field of human and material agencies reciprocally engaged in the play of resistance and accommodation*”. The mangle is a lens through which the outcome of the interaction of human and material agency on the temporal application of practice and the resistance to or the accommodation of change these agencies make is viewed. The mangle emerged from Actor Network Theory (ANT) (Latour, 1987) but differs from it by taking the view that human agency is saturated with purpose while material agency cannot be (White et al., 2015). If this is indeed true, then it can also be argued that humans become a proxy representative for material agency and thus shape material agency according to their purpose. White et al. (2015) use this approach for analysis of individual interactions within a PSM intervention workshop.

The concepts that underpin the mangle, built on the foundations of ANT, clearly provide much help in the analysis of the micro-processes of OR practice (White et al., 2015). However, to address our question, we need an analytical approach with similar power to look outside the confines of the PSM intervention to better understand the practitioner's interactions with the client in *negotiating* the provision of a consultancy service. Therefore, we draw on the idea of *translation* from ANT to further elaborate on how issues of power, interest and control are manifest in the formation of relationships. A convenient way of conceptualizing the process of translation is to characterize how an idea (e.g. negotiating a consultancy deal) is translated, through the identification of a problem or opportunity, from an idea into reality. Callon (1986) formulated this process as a series of “*moments of translation*” (*ibid*, p203) in which actors are enrolled and locked into a practice by making the new opportunity an “*obligatory passage point*” (*ibid*, p205-206). Problematization is the first moment in the process of translation. In this moment, one or more actors are engaged in defining and exploring a problem of interest, which “*renders then indispensable in the network*” (*ibid*, p204). The second moment is that of *interessement* (*ibid*, p206-211) in which those who profess to have a relevant

approach to resolving the problem persuade others to accept their understanding of the situation. It is the “*group of actions by which an entity ... attempts to impose and stabilize the identity of the other actors it defines through its problematization*”. The third moment is enrolment (*ibid*, p211-214), where participants in the problematization become effectively ‘signed-up’ to take part in the process of intervention. Enrolment is thus a “*device by which a set of interrelated roles is defined and attributed to actors who accept them. Intersement achieves enrolment if it is successful*” (*ibid*, p211). A comprehensive example of analysis following this approach can be found in Yearworth and White (2018).

Our review of theory highlights a conundrum we face as methodologists and practitioners. Our review provided the necessary background to the problem at hand, but in the process of reviewing existing work on evaluating and, crucially, commercially valuing PSM interventions there was not an emergent, prevalent theoretical thread. Our recourse to ANT, via the mangle, represents our attempt to re-ignite an interest in theory to complement the essentially empirical flavour of the accounts of PSM use in the review.

4 Methodology

We depart from previous work on the question of PSM value presented in the review through the introduction of the contractual boundary between the client and the consulting organisation as an actant. This actant mediates the relationship between the consulting organisation and the client by expressing the rights and obligations that exist between the two. As an actant, the contract imposes a deontic logic (concerning rights and obligations) to the behaviours between the client and consultancy, including details of what is expected by way of outcomes i.e. what transformation is to be enacted (Ormerod, 2017). We initially thought that the ambiguity and uncertainty associated with prior definition of this intended transformation, especially expressing value in financial and contractual terms, was the root cause of our puzzle. However, accepting the futility of resolving the category error posed by Checkland and Scholes we see that value here needs to be reinterpreted as the competence of the consulting organisation to deliver value *regardless of transformation enacted by the PSM intervention and the outcomes it leads to* (within reasonable bounds). This interpretation resonates with the idea of a *trust relationship* (Faust, 2012, pp. 149-150) that is formed between the client and the consulting organisation in the period leading up to and including the formation of the commercial contract.

We also assert that purely theoretical or purely empirical approaches to understanding how and why PSMs are used are not sufficient. Our methodology thus presents an attempt to weave these two threads together into a coherent whole in the discussion. In our case study we are “*tacking back and forth between nitty-gritty specificities of available empirical information and more abstract ways of*

thinking about them” (Adams, Murphy, & Clarke, 2009, p. 255) to build our analysis and develop conclusions. We therefore depart from the approaches to measuring PSM value described in the review and instead focus on the process of *selling* an engagement rather than on the process of *delivering* the PSM intervention. In taking this step we build on the ‘Context-Mechanism-Outcome’ (CMO) evaluation framework of Pawson and Tilley (1997, p. 72) and further analysis of the nature of a Transformation in the sense of SSM. In doing this we separate the *process of selling* from the *process of PSM intervention* into two separate *transformational events* separated by the contractual boundary. We present this idea in our schema presented in Figure 1.

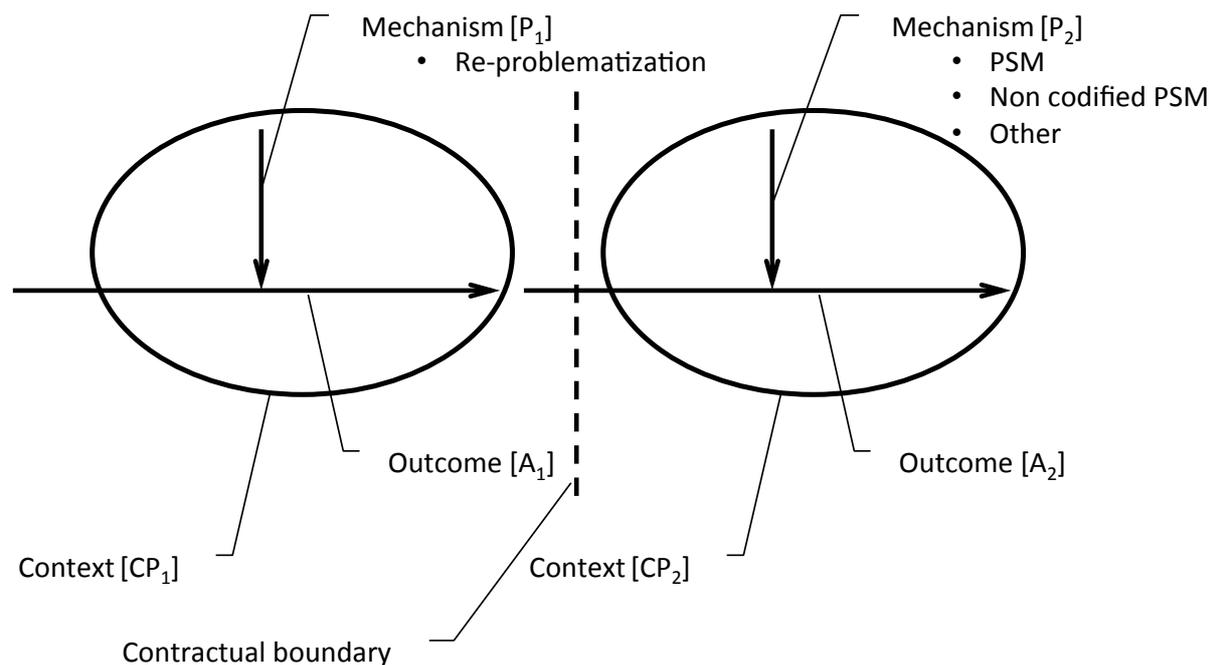


Figure 1. Conceptual schema for the separation of the processes of problematization/interessement and intervention. Adapted from the original CMO framework of Pawson & Tilley (1997, p58).

Here we make use of the idea from SSM that in addition to the ostensible purpose of a PSM intervention is to achieve a particular desired outcome (A_2) by transformation, both the client and the consultant as actors that are also transformed. For the process of selling, this is the transformation that takes both actors from a context (CP_1) of an extant complex problem, to one where they are bound by a commercial contract (A_1). Buried in this transformation is the question of communicating and being convinced about value, but now divorced from the vexed question of associating this value with the delivery of a PSM intervention. This is now separate (as mechanism P_2), and in fact may not even be relevant to the discussions taking place as part of the mechanism P_1 that establishes the contract. Our theoretical underpinnings in ANT now help us with insight into the nature of the translation that is taking place through mechanism P_1 – this initial transformation is really all about problematization, interessement and enrolment (Callon, 1986; White, 2009).

With this theoretical viewpoint in mind, we initiated a data collection exercise focused on interviewing Business Managers within a consulting organisation with a view to understanding more about the first of these two transformations. These data and their analysis are presented in the next section.

5 Case Study

5.1 Data Collection

Data were obtained from a UK based engineering consultancy, henceforth “The Engineering Consultancy” (TEC), that employs one of the authors as a consultant. The business employs 750 people with revenues of £86M (March 2017). Interviewees were selected from the available pool of approximately 100 Business Managers to represent a broad sample from across the technical areas within which the consultancy operates. The interviewees were geographically spread across four out of the consultancy’s seven UK offices. No incentives were offered to take part in the research, participation was reliant on the goodwill of the interviewees. Interviews were arranged by telephone and email and the interviewer was known to the interviewees, either in a personal capacity or through mutual colleagues. Ten people were invited to be interviewed, setting out a sample of approximately 10% of the available pool, however two were not completed due to lack of availability. All but one of the interviews were conducted face to face with the interviewee, the remaining interview was carried out by video conference, and audio recordings were made and field notes were taken. These field notes mainly served the purpose of enabling the interviewer to record where further probing was required. The interviews were transcribed by the interviewer shortly after each interview. An interview protocol was developed which took the form of a script outlining the purpose of the interview, setting out how the data would be used and seeking permission to use the details provided in the interview, a series of questions used to prompt a semi-structured interview and a number of further prompts to elicit more detail from interviewees. The script is presented in Appendix 1.

5.2 Analysis and Findings

Through the coding and analysis process 27 codes were developed, with 224 references to those codes across the eight sources. These codes are shown in Table 1.

Name	Sources	References
Adaptation	2	3
Capability	3	3
Consultants interests	3	3
Contract	6	19
Demonstrating risk of not engaging	2	2
Empathy	1	1
Enrolment	2	4

Failure	4	7
Innovation	1	2
Intelligence	2	6
Interessement	8	41
ITT	2	4
Negotiation	1	1
Networking	6	17
Pre-contact	2	2
pre-contractual agreement	4	5
Pework	5	21
Problem explanation	2	3
Problem extrapolation	1	1
Problem identification	6	7
Problematization	8	50
PSM	1	1
Risk	2	2
Scoping	2	2
Trust	8	12
Value	1	1
Workshop	2	4

Table 1 - Coding summary

Through a process of refining, these initial codes were grouped into eight categories; Adaptation, Contract, Failure, Interessement, Networking, Pework, Problematization and Trust. These categories were the basis for memo writing during the coding process, and the key themes and associated data from each of these is presented next.

5.3 Adaptation

The business managers interviewed work with a wide variety of clients across many industry sectors, from civil servants in defence procurement to health providers and oil and gas producers. A common theme across many interviewees was the need to adapt their approach based upon the audience, with one interviewee noting that language tailored to the client was important.

There is a question of whether the adaptation of appearance and language is fundamentally different to other aspects seen as typical of business development such as such as demonstrating capability or experience. This explored further in the following sections.

5.4 Contract

Much of the work the business managers seek is contracts with governmental clients, such as various sections of the Ministry of Defence (Defence Equipment & Support (DES), Defence Sciences & Technology Laboratory (Dstl) and front line commands), Network Rail, non-departmental public bodies such as government regulators and others. Typically the government mandates, for transparency and value for money requirements, that the majority of this work has to be competitively tendered, albeit with some circumstances where a single source award can be acceptable. This sets

some limits on the lengths that the consultancy is willing to go in order to influence clients prior to winning ('getting on') contract. One interviewee noted that with government clients, if they seek to influence the ITT they have to do this well before the ITT is issued and often before an item makes it on to a long term programme. Any contact with the project team after the ITT is issued is not allowed under contract rules and queries should be made through commercial channels so they can be shared with other tenderers.

"You can say a lot then [early], as soon as they issue the ITT they are quite correct and they don't engage with you, and we won't bother pursuing them at that point."

Another interviewee identified this early engagement as a strength when dealing with such contracts.

"So for example we're in dialogue with somebody and we'd like to do this package of work and they have to compete it, then it's much better for us to work up the requirement that will go into the ITT."

Conversely, where this early influence is not available the interviewee will not bid at all.

"Where we only receive the ITT late we're not often interested in even bidding as there has been no chance to influence."

Other interviewees sought this early engagement as a method to shape the ITT when it is issued.

"The commercial guys will respond to bids, but the project teams will write the requirement. So actually to have an above 50% chance of winning a competitive tender you've got to be in alongside the project team helping them to write the requirement."

This is often done through repeat work, where the consultancy have people involved in either previous stages of that programme, or other elements, and provide advice to the client on what the ITT should look like.

Counter to this, there are issues in these types of contracts where the consultant can be seen to provide too much work upfront to be considered for awarding the main contract. One interviewee noted that that being seen to do too much work can cause issues commercially, *"their [the government client's] commercial team will see that as them binding in contractually to work they haven't given you a contract for."*

A business manager who works in the rail sector noted that these contractual behaviours are not limited to government clients, but that large multinationals can have similar rules too.

"They [a multinational organisation] also have an internal process that says if you're going out for work over £100k you must compete it."

The interviewee in the case went on to note that these rules can in cases be broken, citing a recent piece of work with this client which was not competitively tendered but had a value above this threshold.

Framework contracts are seen by many of the business managers as ways to avoid these potential issues, allowing greater room for problem exploration prior to any formal delivery agreement being formed under the pre-existing framework contract.

Additionally, for mid-sized consultancies such as TEC there is also the opportunity to engage through framework contracts belonging to tier one suppliers, as noted by a number of interviewees.

“Increasingly we’re developing relationships with big tier one contractors such that when we identify interesting work we know they can’t do and ask if we can use their framework with them taking a cut”

This does have potential downsides and may only be sustainable in the short term, as noted by another interviewee.

“Long term maybe it’s not the right approach, as [competitors] who have some fantastic engineering capability are suddenly aware of what we’re doing and then might develop that capability”

5.5 Failure

Failure is often caused by not identifying the correct people within an organisation to engage with to develop potential contracts. There are many reasons they might not be the right person but can generally be characterised by not holding sufficient (or the correct) power and influence within that organisation, with one interviewee stating:

“Unless you know very, very clearly your contact’s remit and what they have authority to do you can waste time, and we have wasted time in the past, convincing an individual that TEC is right when they don’t have the authority to do anything about it.”

Indeed, it is even possible that the person who has the authority who you have been dealing with leaves the client organisation. One interviewee found that *“we had won over the people with the cash and then they left, so we had to re-cock and start again.”*

One interviewee recalled a failed tender against a government ITT where they felt they had a better understanding of the clients needs and so knowingly put in a non-compliant tender to undertake a scoping study in advance of a potential larger piece of work. This was not successful as in this case the commercial rules of the organisation prevented them from considering non-compliant tenders, even if they might provide a better solution. This approach by potential clients can lead to a reduction in innovation, with one interviewee adding, *“offering something innovative isn’t necessarily the right way of winning these tenders.”* We can see that the consultant in this case is actively discouraged from providing an innovative solution as this might not fit in with the marking scheme which has been prepared in advance of receipt of tenders.

5.6 Networking

All the business managers interviewed raised networking as an important part of their job. One interviewee when asked about the core responsibility of his role responded *“It’s about networking, honestly, never ever make enemies in life unnecessarily.”*

Similar to the failure theme discussed in section 5.5, many business managers viewed identifying the correct person in the client organisation as being paramount to being successful in developing positive engagements. One interviewee noted that *“generally access is through one individual and often it is only that one individual you need to sell the idea to.”* However, they went on to add that *“he may defer you to technical colleagues, but only to check what you are doing”*. So in this example, while the business manager has identified the senior responsible person they have also noted that additionally others within that organisation need to be satisfied that the consultancy has the technical capability to deliver.

The interviewees noted that repeat business forms a large part of the future order book and as such informal networking often takes place when colleagues are working on other projects.

“We’re generally dealing with the same people over and over again in our customer organisations and the job is to get to know them and understand the challenges they’re facing in delivering their roles and how we might support them.”

In such cases it is typically not the business manager who is directly involved as they generally have no role in the delivery of a project post contract. One interviewee stated how he relies on this business intelligence:

“It’s not always me in the room so opportunities might come from other TEC staff who come to me from a meeting they’ve had with a customer either as part of a delivery and they explain to me that an opportunity exists.”

This was further developed on by another interviewee who found that although being with the potential client was the best approach to understanding their problems, outside of being formally invited you needed a legitimate reason to be with the customer.

“Floorplate presence, and a reason to be there as well. You can’t just have a business developer who just walks around talking and everyone looks at him and thinks he’s just there to take money from us.”

Networking is clearly an important step in developing relationships with customers and gathering intelligence on future engagements, however there are many different approaches to doing this and it clear that the correct approach needs to be taken in order to be successful.

5.7 Prework

The interview questions directly asked interviewees of their use of work at risk, defined within TEC as work which results in a deliverable to the client prior to formal agreement of a contract, and this was intended to help develop an understanding of how the business managers use such work to form the basis of successful engagements. This does not include initial meetings with or presentations to potential clients as these are budgeted for separately. Similarly, the response to ITTs is not covered here as these costs are accounted for elsewhere.

One interviewee expressed a tendency to avoid such approaches and instead rely upon their own knowledge of the client gained through their own experience of working within that market. This interviewee focussed solely on approaching clients through his knowledge of the relevant market.

“If I consider them a high priority organisation or a high priority programme I might spend more time trying to understanding them Sometimes I’ll just use my current level of understanding and see where I get to. It’s a bit of a black art.”

Whereas all the other interviewees were more inclined to provide potential clients with some free advice upfront if it made it more likely that they won future work. In some cases this was work which was delivered to a client, such as:

“The way that we would typically do that is we might generate a one pager or a white paper which talks about different potential solutions.”

And:

“We started out on [a large project] like that, we did give them a document for free that actually scoped out what their requirements were.”

Whereas other interviewees were more reluctant to give things away, but would put effort into doing work, demonstrating it to a potential client but not leaving them with a product at the end of the demonstration. One interviewee went so far as to develop a functional simulation of a clients system so that they could present this in a sales meeting and show the impact of changes to this system.

“We knocked up a prototype for what we thought the solution might look like. The reason for doing that was to demonstrate what we meant by modelling. So being able to click on something, change a parameter and then instantly see the impact of that on your global system... That particular example I don’t know there was much more in it than saying this is what we’ve done, come and take a look and showing them it on the laptop.”

There is a clear risk in giving away such detail before a contract, but in this case the interviewee had assessed that risk.

“I wasn’t concerned about that in that example, because I knew they didn’t have a capability in house and I knew that our solution was sufficiently different from the competition.”

So pre-work such as this has a clear benefit in communicating to potential clients how the consultants perceive their problem and any solution they propose might be required. Some care needs to be taken not to provide too much detail in advance and there are ways of limiting this risk, such as not leaving work with potential clients. As with networking, it can be seen that both these areas are where trust is developed between the client and the consultant.

5.8 Problematization

The interviews clearly illustrate problematization as the process of the consultant becoming indispensable to the client by defining the problem and suggesting how this would be resolved if all parties agreed to the programme of work set out by the consultant. This manifested in many different ways across the interviews, and some of those have been discussed in the sections above and where appropriate these will be drawn together here.

Problematization can occur through a number of different means, and set out here are three ways in which business managers from TEC have undertaken this transformational process; i) developing personal relationships, ii) demonstrating capability, and iii) demonstrating an understanding of the real problem the client is experiencing.

One interviewee linked problematization to capabilities of the people involved in forming the relationship between the consultancy and clients. That is, the consultancy is in the business of selling people

“So to make ourselves indispensable we need to demonstrate that the people who will be delivering the work are the right people to do the job”.

As discussed in 5.7 above this can either be done through meeting with the client, or more effectively by getting consultants into the client organisation for a few days to deliver small amounts of work or to help the client explore the problem. There is a need for these to be the *right* people, otherwise the approach may not be successful, with the consultancy not making itself indispensable to the potential client. In one interviewee’s opinion, the capabilities (expressed as technical proficiency) of the people are at least as important as their specific approach to the problem.

“I’ve taken all sorts of people with specific skill sets into a room and within ten minutes you can see the guys, our potential client is completely satisfied that we’ve got a high level of technical proficiency and working with us is not going to be a risk. You can see that in 10 minutes”

This was also the preferred approach of another interviewee, who added:

“Typically I would say the main way we approach pre-sales engagement with organisations is focussed around individuals.”

This interviewee works in a market which is relatively new to TEC, so they are unable rely upon the reputation they may have in other markets. The interviewee has similarly found that a long-term approach is required.

“All the way along, and there’s a number of people involved, we’re capturing information from every discussion we have. We’re trying to build up our unique offering, we’re trying to differentiate us from our competitors in that market. It’s not just technical people we need to influence, its procurement people. We need to access through the right frameworks etc. So that’s quite a complicated one.”

Another interviewee working with mainly non-governmental clients was more concerned with the consultancy’s ability to demonstrate their experience of working within a particular market and using this experience to demonstrate how the consultancy understands the potential client’s problem. This has been described in 5.6 above as identifying potential customers and networking with them to develop the one-on-one relationships that might potentially lead to future work. The interviewee makes it clear this is a long-term process and that demonstrating capability is key in this market, especially where the consultancy does not already have a reputation.

“Typically I would say the main way we approach pre-sales engagement with organisations is focussed around individuals.”

And

“If I think about where we’ve had success in using that approach, and where things haven’t been quite as successful. It’s probably come down to our ability during those initial engagements to convince that individual that we sufficiently understand their problem and had similar experience elsewhere.”

One interviewee has successfully done this in the past by pointing potential clients to past clients who had similar problems and in effect asking them to provide positive references:

“We said to the [potential client team] just ask the [past client team] how it helped them and of course they say TEC were great, they did this, they did that and it helped me to do this and de-risk this.”

Undertaking work at risk can also be a successful means to demonstrate how a consultant might be indispensable to a potential client. In the simulation example discussed above the interviewee went on to note that the prime reason for developing the simulator was that TEC did not have the capability to deliver what the client had originally asked for, but that an alternative approach would exceed their original requirement and deliver further insight into the problem.

“We went away and had a think about it and decided that actually we can’t deliver that but what we thought they needed wasn’t a fancy visualisation but what they really needed was some insight into their system.”

This interviewee also provided an account of what happened when they went to meet the client to demonstrate this simulator:

“At the beginning of the meeting, it was a gamble, the guy didn’t want to be there. I think he had regretted setting up the meeting. By the middle of the meeting it was clear he started engaging with what I was doing. By the end of the meeting he was incredibly enthusiastic about the approach.”

This was clearly a high risk approach, the development of the simulator cost the consultancy approximately £5,000 and if it had not been successful any future relationship with the client may also have been damaged as they would be seen as timewasters. In this case the approach was successful and the interviewee went on to state that they were awarded a contract valued at several hundred thousand pounds.

One interviewee noted a case where they were involved in a large programme, and were aware that the delivery organisation had become quite stove-piped and the forward work plan was not as efficient as it could have been. They sought a workshop with people across the delivery organisation in order to address this and demonstrate the need for streamlining of the future programme. In order to organise this workshop, the interviewee went through a long process of building a relationship with the potential clients.

“The thing is that process didn’t start at the workshop, in order to get the guys there and speak openly and trust us we have three years of engagement with them prior to that workshop.”

Problematization is a key component of building the relationship between the consultant and the potential client and there are a number of different ways the business managers that were interviewed have done this.

5.9 Interessement

Interessement is the next stage of translation and here is understood as the process whereby the consultants “seek to lock the other other actors into the roles that had previously been proposed to them”. One interviewee provided a good example of failed interessement - they gave the client a solution and rather than accepting the role of customer to that solution as intended, the client decided they had the capability to deliver the solution and did so themselves. This was the key point of translation in this network.

“I’ve seen before when we’ve approached [a client] and the way that the project manager laid it out it gave them the answer and they said great, thanks very much we’ll do it our self then and we lost the work.”

Building upon this failure, and attempting to understand why this happened, a discussion of how much information is enough to give away to ensure interessement is successful took place and this was also followed up with other interviewees. The interviewee suggested

“a good way of doing that is you can talk about a period where you need to engage and understand better before you then start to work out what the solution might look like.”

A further interviewee made a subtler point in relation to competitively tendered projects. In such cases, as set out in 5.4 above, once the ITT has been issued any queries will be shared with all other interested parties, so there is a question of how much is enough information for TEC to give away to achieve enrolment (to get ‘on contract’) without potentially giving the other parties enough information to win the contract. The same interviewee considered competitive tendering to be damaging to this process:

“I think you can use competition, but increasingly that competition means we disengage, we give you a requirement, everybody gets the same level of disengagement and therefore we can judge it as a level playing field. In my view, that’s actually counterproductive. What you then get is, no doubt you’ve done it, you’ve written an email to a friend and he’s misinterpreted it. Anything in the written word can be misinterpreted, until you get the chance to engage more thoroughly. So I think it’s more commonplace at the moment to be distant and stand offish during the competitive process, but I think it really hinders progress.”

One interviewee has found utility, when there is no clearly defined solution to a perceived problem, in convincing the client to fund an initial scoping study which allows the consultancy to investigate the problem and develop requirements on behalf of client. This has the benefit of both being seen by the client to be forward thinking and progressive in helping them understand their problem, but also enables the client to gather intelligence which will help them win any future work resulting from this scoping study:

“You get in there [to the clients premises] and actually it’s a win-win, because you say yes I don’t mind it then goes to competition as you’ve spent time in there, already done a lot of the thinking and actually they’ve paid you to do your enquiry.”

As raised in 5.4 above some client organisations, such as government clients or large multinationals, have procurement rules which would prevent this from happening. This interviewee additionally identified the role competitors play during interessement in enacting resistance to its success. A consultant must be aware of this potential resistance and develop methods to respond to this. In his

example this is done through differentiating services and the work they wish to do from that of their competitors.

“In the backdrop of all this [a competitor] were saying you don’t need TEC we can [do] the whole thing, rework and design. We said you don’t want to do that you want to keep the modelling separate to keep them honest and do your risk mitigation [the alternate piece of work suggested by TEC].”

A different interviewee noted that even though in cases where these strict procurement rules apply it does not mean that interestment will be bound to mechanistic procurement rules. The consultant still has the ability to influence this beyond what is set out in written tenders.

“The people who are signing it off are human beings. So while they are intending to review based on what’s in front of them, if you’ve already sold them on what a great idea you have and how you’re going to deliver this and it has TEC’s name written all over it, it’s going to influence their decision making when they’re doing the evaluation.”

One interviewee noted that there can be an additional requirement to provide the confidence to their contact at the client organisation to sell the consultant themselves to more senior members of the organisation responsible for funding.

Interviewee: *“This guy needs to get funding from his board. The engineers get money by drawing down from there and there’s a committee of people who need to approve how money is spent. So he needs to go to them to get approval.”*

Interviewer: *“Is that only him who needs to do that? So if you convince him to use you, he has to convince this board himself?”*

Interviewee: *“Exactly.”*

An interviewee in the rail sector was, at the time of the interview, involved with repeat customer and doing work before a contract. In this engagement, problematization had already taken place at some point in the past and was essentially skipped and the engagement moved straight into interestment. Through pre-work and a previous working relationship they have locked in the role of delivery for themselves and the role of client for the potential customer:

“A much simpler one, we know a certain company in the railway industry has had some safety challenges recently. We’ve got a good relationship with them, they recognise we have a decent safety offering, and we’ve helped them out with problems before and we’re engaged with them at the moment – before we have received an ITT, before they’ve approached us formally or provide a proposal we’ve done some initial ground work for them to help they understand what the problem is.”

This interviewee also repeated concerns raised by others about the amount of work which should be delivered to a potential client pre-contract to enable lock-in both without giving so much away you enable others to deliver the future work instead.

Interviewer: *“So there’s something there then of when doing this presales work of not revealing all of your cards? It’s revealing enough of your cards to make them confident in you doing the work rather than [a competitor] or whoever?”*

Interviewee: *“Exactly, and that’s a balance I’m relatively new to. The business manager role at TEC is about developing ways of dealing with this.”*

5.10 Trust

An overarching theme across all interviews was the development of the trust relationship between the consultant and the potential client. Indeed, it can be seen that this is a common thread across all the themes described above.

One interviewee noted that the potential client had to rely on trusting the individuals representing the consultancy as a proxy for trusting the consultancy itself.

“They need to trust the consultancy. But that is expressed through the people they’re seeing. The consultancy is made up of lots of people.”

The same interviewee went on to discuss an example where a colleague had previously been embedded within the customer organisation and noted that in such cases this was even more important.

“The second example is about a person injected in an organisation who they really liked and I think it’s the company and everything that expresses, but it’s actually belief in the individual they see in front of them.”

While it is important that the consultancy itself is trusted, this trust can only be measured by the potential customer through the interactions they have with the individuals representing the organisation. One interviewee noted that a key part of this is delivering upon what you promise to do.

“Going back to the trust thing, I always consider first of all, on first contact when building the relationship when it’s in its embryonic form. Do what you say you’re going to do when you say you’re going to do it.”

Another interviewee noted that a key part of this early relationship is to demonstrate to the potential client that you can be trusted to deliver the solution that they need.

“They want to be confident that it will be solved and it’s going to make them look good, take their problem away and hopefully within the right budget”

There were distinct variations between interviewees who worked within market sectors which the consultancy had worked in for a long time and those who were trying to expand the consultancy into new, to them, markets. One interviewee was focussed on a new market and expressed challenges that this caused to developing the trust they felt was necessary to be more guarded when talking to clients in case they took their ideas to a consultancy with which they had a long standing relationship.

“We have to be careful putting ideas out there about how certain problems can be solved as that can lead to the customer saying, ‘that’s a good idea that I’ll go and talk to my friends at...’”

This is opposed to another interviewee who had a long term relationship with a customer, who instead of trust was concerned with how they could develop the relationship they already had outside of contractual boundaries.

“We’ve been working with them for years. I think the interesting question is, how do remove the money from the working level of the relationship so that you can have a honest chat and not just one conversation, but an ongoing conversation about what we bring to the party and what they bring to the party, actually other industry as well. How do we work together to throw good ideas around? It seems harder for others who are more worried about their IP than we are.”

6 Discussion

From the eight categories identified from the data, two prevalent themes emerge relevant to our question. Firstly, and what seems to be a straightforward observation, clients need to be convinced of the consultancy’s capabilities, which are associated with the technical proficiency of the people ‘offered’ to the client. These capabilities appear to transcend any specific approach to addressing the client’s problem situation. Secondly, the pre-contractual engagement with a client presents a dilemma for the consultancy. It offers both the opportunity to convince the client of its grasp of the problem situation and therefore worthiness to win a contract, but also the risk of either *leaking* that understanding to competitors via the client or *enabling* the client to ‘go it alone’. This leaking or enabling could be thought of as providing problem structuring for free. This is similar to the analysis of the case study presented by White (2009) where he recounts the episode that led to his joining a group subsequent to a problematization that surfaced issues of relevance to his expertise in PSMs:

“It seemed that enrolling the actors would need a re-presentation of the approach of the forum. The intervention, from this point, was re-invented: a different tactic for translation was adopted” (ibid, p830).

The intervention using problem structuring was dependent on this new translation, rather than being a consequence of selling the virtues of PSMs. The episode mirrors our findings and lends support to the schema we present in Figure 1. Our conclusion is that the consultancy here, and in (White, 2009), is

not selling a PSM intervention *per se*, they are selling a *process* that supports the client in the ostensible purpose of addressing their initial problematization. However, the actual enrolment occurs at the point where the consultant achieves the *necessary translation* in the client – where the client becomes to firmly *trust* that the consultant’s *re-problematization* is likely to yield the requisite reward in value i.e. the consultant has *sold* the engagement. From this point on, the network of actors is firmly established, which is then expressed as a contractually binding relationship. We note that the actual transformation achieved by the engagement and ostensible purpose may in fact have little in common.

Returning to (Morrill, 2007), her recommendations remain attached to the idea of selling the PSM intervention rather than as we conclude, selling a re-problematization through a process of necessary translation in the client that must take place *before* the PSM intervention. White (2006), following (Keys, 1998) originally, promoted this ANT perspective to the analysis of PSM interventions, saying

“The whole history of the intervention (or ‘technology in action’) could be construed as an attempt to configure or enrol (i.e. define, enable, constrain) the client/expert.”

and White (2009) provides the earliest indication of the necessity of the partitioning of this stage of enrolment as something quite distinct.

Now we are able to revisit our initial question, the category error puzzle posed by Checkland and Scholes, and show that we have uncovered an actual paradox at the heart of Soft OR practice. For potential clients embroiled in a mess the process of a consultancy selling a PSM intervention *requires* problem structuring to convince the client of the consultancy’s capability. In the process of demonstrating this capability competitors and/or the client may benefit from the insights gained to the commercial detriment of the consultancy. However, should the consultancy win the business the actual need for a PSM intervention becomes moot.

Poole and de Ven (1989) set out a number of theory-building strategies that take advantage of such paradoxes and here suggest that we *“accept the paradox and use it constructively.”* However, the sticking point in moving forward is the re-problematization and translation that must occur *before* a PSM intervention can be sold and implemented. Having achieved this first process, the necessity of a *specific* PSM intervention to be implemented seems to fade away. The engagement may achieve ostensible purpose, or indeed any other transformation that both the client and consultancy would mutually agree to declare as success. Therefore, we suggest the way forward for PSMs, at least in the commercial world and to use this paradox constructively, is to make a complete break between re-problematization/translation and the more procedural aspects of implementing a PSM intervention – such as group model building or use of a group decision support process. These would then be separated either side of the contractual boundary. If, as some might argue, the two are indivisible then we offer an alternative interpretation of our analysis and findings; PSM interventions can *never* be

sold in a commercial setting where prior (financial) value of outcomes must be agreed. However, we see commercial value, in the sense of helping to win business, in the use of PSM interventions in their entirety as part of what a consultancy should be doing to win business. This is of course work carried out at risk but we believe that this is a necessary cost of doing business.

The *art* of doing business with PSMs for a consultancy is thus the development of creative strategies for managing pre-sales engagements using PSM interventions to avoid either i) leaking insights gained from the problem structuring process to commercial competitors or, ii) so enabling clients that they need no further help from the consultancy. The characterisation of this art in the pre-contractual phase of a relationship requires a new engagement with critical perspectives on the nature of the relationship between the two (e.g. Nikolova and Devinney (2012)).

The identification of a paradox at the heart of Soft OR practice and its resolution has an impact on the way in which a consultancy should approach its use of PSMs. Their use pre-sales, whilst introducing complexities and risk to the business, also provides an unexpected bonus. Since it is essential for any consultancy business to closely monitor its cost of sales (pursuit costs) this affords a mechanism by which the value of PSM engagements can be measured in a meaningful way by the simple expedient of trialling their use on a sub-set of overall pursuits. This suggests a whole new avenue of further work to explore the value of PSM interventions empirically. Apart from the immediate measure of contracts won or lost there is also the possibility of investigating where the use of PSM interventions pre-sales lead to ‘better’ engagements overall by tracking won projects on a longitudinal basis. This opens up the prospect of researching PSM interventions from the entirely new perspective of measuring their impact on information asymmetries between consultants and their clients in the formation of contracts – the adverse selection problem (Akerlof, 1970; Macho-Stadler & Perez-Castrillo, 2001, pp. 103-182). This leads to the eminently testable hypothesis that use of PSM interventions in the process of negotiating a consultancy contract should lead to fewer ‘problematic’ deals and thus better profitability. This is an active area of further work.

7 Conclusions

We started out with the issue that addressing the problem of selling the value of a Problem Structuring Method (PSM) intervention to a client is difficult and remains a persistent puzzle in the literature. In exploring the complex situation of selling OR, we address limitations in the extant literature in three main ways. First, the micro-processes and micro-practices perspectives, particularly the mangle of practice (Ormerod, 2016; Ormerod, 2014; Pickering, 1993, 1995) and Actor Network Theory (Callon, 1986; Latour, 1987), hold unexplored promise for understanding the take up of OR interventions (White et al, 2016). Second, micro-practice and processes perspectives enable the consideration of individuals, their characteristics, and their interactions as relevant relations in the nature of selling

OR, thus enabling an understanding of this process as dynamic socio-material networks. Third, insights may be gained by studying the practice of interacting processes as they enable productive dialogue and progression in interventions. Thus, the micro-processes and practices perspectives constitute a growing area of theoretical, methodological and empirical interest in the study of PSM interventions.

We have presented empirical data covering a range of pre-sales engagements that develop our theoretical treatment of the problem of selling PSM interventions. In doing so, we contribute to the debate on the most pursuit worthy approach to understanding the process and practice of OR (Keys, 1989, 1998; Keys & Midgley, 2002).

Finally, starting from the puzzle originally posed by Checkland and Scholes as something akin to a category error, we have developed a new position on the question of valuing PSM interventions that is a true paradox. Morrill (2007) raised the “*inability to sell the benefits*” as a concern regarding the development and marketing of PSMs. If in the future PSMs are to be sustainable as a viable commercial offering then in addition to the work currently being done in developing the theoretical understanding of PSMs (Ackermann, 2012; Eden & Ackermann, 2006; Howick & Ackermann, 2011; White, 2009; Yearworth & White, 2014), focus is now required on how to organise the commercial offering of PSM capabilities outside of the realm of academic OR practitioners in the full knowledge of this paradox.

The implications of our work are clear. Researchers and practitioners of OR need to understand the nature of their processes and practices, which will shape the performance implications of selling OR methods. We suggest that future work should focus on aspects such as re-problematization/translation more specifically. However, caution must be ensured with respect to promoting a uniform view across all types of engagement. Finally, as with all studies, our work has a number of limitations that merit some brief comments. Primarily, our analysis relies on data from a single organisation. In mitigation, the presence of one of the authors in the organisation presented an opportunity to collect empirical data from a trusted perspective, a position rarely available to the academic researchers. The resolution of the Soft OR paradox came late in the analysis of the data, so the obvious next step in setting up a study in the organisation to collect quantitative data on PSM performance pre-sales is now an area of further work. The identification of a new research question on the relation between PSMs and reducing information asymmetry in contract formation presents a promising area for empirical investigation, quantitatively and longitudinally.

Acknowledgments

This work was supported by the EPSRC funded Industrial Doctorate Centre in Systems (Grant EP/G037353/1).

Appendix 1 – Interview Script

Thanks for agreeing to participate in this research interview. I really appreciate your taking time to talk to me today. The conversation we're about to have should last no more than an hour, and of course you're very welcome to ask questions at the end, or at any point during the process. I would like to record the interview, is that ok? Once I've transcribed the content, the recording will be deleted and the entire transcript will not be shared, however some of the information you give will be along with any pertinent direct quotations.

This process is called a semi structured interview because it follows a loose routine of questions that I hope will help elicit your thoughts and feelings about how you work with clients to understand their problems pre-sales at TEC.

I'd like to stress that there are no right or wrong answers in this interview process; the intention of this interview is so that I might get a better understanding of the processes used.

It is our hoped that this work will help inform TEC on any improvements that can be made to how we can deliver more successful projects and programmes for clients when we better understand these kinds of projects.

All our results will be made anonymous, and this investigation is conducted in accordance with the guidelines provided by the University of Bristol research ethics committee. Any specific details relating to projects will not be included in any output. If you'd like a copy of the ethics guidelines, you can let me know at any time.

The findings may be published in international journals and will form part of my doctoral thesis. Of course, I would be delighted to provide you with a copy of the findings once the study is completed.

Do you have any questions at this point?

Following this introduction, a semi-structured interview technique was used, based upon the following four questions:

1. *Thinking about how you identify opportunities with clients, could you provide me with some recent examples of how you have undertaken this process?*
 - a. *Could you provide a narrative of the process that was undertaken, either directly by you or by others involved in the project, in order to enter into a formal contract to deliver the project?*
2. *Do you undertake work at risk to help clients better understand the problem for which they think they need a consultancy, such as TEC, to deliver a solution?*
 - a. *If so, how would you go about that process?*

References

- Ackermann, F. (2012). Problem structuring methods 'in the Dock': Arguing the case for Soft OR. *European Journal of Operational Research*, 219(3), 652-658. doi: 10.1016/j.ejor.2011.11.014
- Ackermann, F., & Eden, C. (2011). Negotiation in Strategy Making Teams: Group Support Systems and the Process of Cognitive Change. *Group Decision and Negotiation*, 20, 293-314. doi: 10.1007/s10726-008-9133-y
- Adams, V., Murphy, M., & Clarke, A.E. (2009). Anticipation: Technoscience, life, affect, temporality. *Subjectivity*, 28(1), 246-265.
- Akerlof, G.A. (1970). Market for lemons - quality uncertainty and market mechanism. *Quarterly Journal of Economics*, 84(3), 488-500. doi: 10.2307/1879431
- Callon, M. (1986). Some elements of a sociology of translation: domestication of the scallops and the fishermen of St Brieuc Bay. In J. Law (Ed.), *Power, Action, and Belief: A New Sociology of Knowledge* (pp. 196-233). London: Routledge and Kegan Paul.
- Checkland, P. (2006). Reply to Eden and Ackermann: Any future for problem structuring methods? *Journal of the Operational Research Society*, 57, 769-771. doi: 10.1057/palgrave.jors.2602111
- Checkland, P., & Scholes, J. (1999). *Soft Systems Methodology in Action: Including a 30-year retrospective*. Chichester: Wiley.
- Eden, C. (1982). Management Science Process—Problem Construction and the Influence of O.R. *Interfaces*, 12, 50-60. doi: 10.1287/inte.12.2.50
- Eden, C. (1989). Operational Research as Negotiation. *Operational Research and the Social Sciences*, 43-50. doi: 10.1007/978-1-4613-0789-1_5
- Eden, C. (1992). A framework for thinking about Group Decision Support Systems (GDSS). *Group Decision and Negotiation*, 1, 199-218. doi: 10.1007/BF00126263
- Eden, C., & Ackermann, F. (2006). Where next for problem structuring methods. *Journal of the Operational Research Society*, 57(7), 766-768. doi: 10.1057/palgrave.jors.2602090
- Eden, C., & Sims, D. (1979). On the nature of problems in consulting practice. *Omega*, 7(2), 119-127. doi: 10.1016/0305-0483(79)90099-9
- Faust, M. (2012). Sociological perspectives on management consulting. In T. Clarke & M. Kipping (Eds.), *The Oxford handbook of management consulting*. Oxford, UK: OUP.
- Fildes, R., & Ranyard, J. (2000). Internal OR consulting: Effective practice in a changing environment. *Interfaces*, 30, 34-50. doi: 10.1287/inte.30.5.34.1638
- Fildes, R., & Ranyard, J.C. (1997). Success and Survival of Operational Research Groups-A Review. *The Journal of the Operational Research Society*, 48, 336. doi: 10.2307/3010262
- Franco, A. (2006). Forms of conversation and problem structuring methods: A conceptual development. *Journal of the Operational Research Society*, 57(7), 813-821. doi: 10.1057/palgrave.jors.2602169
- Franco, A. (2013). Rethinking Soft OR interventions: Models as boundary objects. *European Journal of Operational Research*, 231(3), 720-733. doi: 10.1016/j.ejor.2013.06.033
- Franco, A., Shaw, D., & Westcombe, M. (2007). Taking problem structuring methods forward. *Journal of the Operational Research Society*, 58(5), 545-546. doi: 10.1057/palgrave.jors.2602366
- Franco, L.A., & Hämäläinen, R.P. (2016). Behavioural operational research: Returning to the roots of the or profession. *European Journal of Operational Research*, 249(3), 791-795. doi: 10.1016/j.ejor.2015.10.034
- Franco, L.A., & Rouwette, E. (2011). Decision development in facilitated modelling workshops. *European Journal of Operational Research*, 212(1), 164-178. doi: 10.1016/j.ejor.2011.01.039
- Friend, J., Bryant, D., Cunningham, B., & Luckman, J. (1998). Negotiated Project Engagements: Learning from Experience. *Human Relations*, 51, 1509-1542. doi: 10.1177/001872679805101206
- Friend, J., & Hickling, A. (2005). *Planning under pressure*. Oxford: Butterworth-Heinemann.
- Giddens, A. (1984). *The Constitution of Society - Outline of the Theory of Structuration* (Vol. 1): University of California Press.

- Horlick-Jones, T., & Rosenhead, J. (2006). The uses of observation: combining problem structuring methods and ethnography. *Journal of the Operational Research Society*, 58, 588-601. doi: 10.1057/palgrave.jors.2602271
- Howick, S., & Ackermann, F. (2011). Mixing OR methods in practice: Past, present and future directions. *European Journal of Operational Research*, 215(3), 503-511. doi: 10.1016/j.ejor.2011.03.013
- Kaptelinin, V., & Nardi, B. (2006). *Acting with Technology: Activity Theory and Interaction Design*. MIT Press.
- Keys, P. (1989). OR as technology - some issues and implications. *Journal of the Operational Research Society*, 40(9), 753-759. doi: 10.1057/jors.1989.137
- Keys, P. (1998). OR as technology revisited. *Journal of the Operational Research Society*, 49(2), 99-108. doi: 10.1057/palgrave.jors.2600502
- Keys, P., & Midgley, G. (2002). The process of OR. *Journal of the Operational Research Society*, 53(2), 123-125. doi: 10.1057/palgrave.jors.2601313
- Kirby, M.W., & Capey, R. (1998). The Origins and Diffusion of Operational Research in the UK. *The Journal of the Operational Research Society*, 49, 307. doi: 10.2307/3010543
- Latour, B. (1987). *Science in action : how to follow scientists and engineers through society*. Milton Keynes: Open University Press.
- Llewellyn, N., & Hindmarsh, J. (Eds.). (2010). *Organisation, interaction and practice : studies in ethnomethodology and conversation*. Cambridge, UK ; New York: Cambridge University Press.
- Macho-Stadler, I., & Perez-Castrillo, J.D. (2001). *An introduction to the economics of information : incentives and contracts* (2nd ed.). Oxford: Oxford University Press.
- Midgley, G., Cavana, R.Y., Brocklesby, J., Foote, J.L., Wood, D.R.R., & Ahuriri-Driscoll, A. (2013). Towards a new framework for evaluating systemic problem structuring methods. *European Journal of Operational Research*, 229, 143-154. doi: 10.1016/j.ejor.2013.01.047
- Mingers, J. (2011). Soft OR comes of age-but not everywhere! *Omega*, 39(6), 729-741. doi: 10.1016/j.omega.2011.01.005
- Mingers, J., & Munro, I. (2002). The Use of Multimethodology in Practice - Results of a Survey of Practitioners. *Journal of the Operational Research Society*, 53, 369-378. doi: 10.1057/palgrave/jors/2601331
- Mingers, J., & Rosenhead, J. (2004). Problem structuring methods in action. *European Journal of Operational Research*, 152(3), 530-554. doi: 10.1016/s0377-2217(03)00056-0
- Mingers, J., & Taylor, S. (1992). The use of soft systems methodology in practice. *Journal of the Operational Research Society*, 43, 321-332.
- Mingers, J., & White, L. (2010). A review of the recent contribution of systems thinking to operational research and management science. *European Journal of Operational Research*, 207(3), 1147-1161. doi: 10.1016/j.ejor.2009.12.019
- Morrill, N. (2007). Are the benefits of PSMs being sold sufficiently? A practitioner's view. *Journal of the Operational Research Society*, 58, 686-689. doi: 10.1057/palgrave.jors.2602375
- Nikolova, N., & Devinney, T. (2012). The nature of client–consultant interaction: A critical review. *The Oxford handbook of management consulting*, 389-409.
- Ormerod, R. (2016). Writing practitioner case studies to help behavioural OR researchers ground their theories: application of the mangle perspective. *Journal of the Operational Research Society*, 1-14. doi: 10.1057/s41274-016-0011-8
- Ormerod, R.J. (2010). Articulate intervention revisited. *Journal of the Operational Research Society*, 61(7), 1078-1094. doi: 10.1057/jors.2009.47
- Ormerod, R.J. (2014). The mangle of OR practice: Towards more informative case studies of 'technical' projects. *Journal of the Operational Research Society*, 65(8), 1245-1260. doi: 10.1057/jors.2013.78
- Ormerod, R.J. (2017). The logic and methods of OR consulting practice: towards a foundational view. *Journal of the Operational Research Society*, 1-22. doi: 10.1080/01605682.2017.1392407
- Pawson, R., & Tilley, N. (1997). *Realistic Evaluation*. London: Sage.
- Pickering, A. (1993). The mangle of practice - agency and emergence in the sociology of science. *American Journal of Sociology*, 99(3), 559-589. doi: 10.1086/230316

- Pickering, A. (1995). *The mangle of practice : time, agency, and science*. Chicago ; London: University of Chicago Press.
- Poole, M.S., & Van de Ven, A.H. (1989). Using paradox to build management and organization theories. *Academy of management review*, 14(4), 562-578.
- Shaw, D. (2006). Journey Making group workshops as a research tool. *Journal of the Operational Research Society*, 57(7), 830–841. doi: 10.1057/palgrave.jors.2602155
- Shaw, D., Franco, A., & Westcombe, M. (2006). Problem structuring methods: New directions in a problematic world. *Journal of the Operational Research Society*, 57(7), 757-758. doi: 10.1057/palgrave.jors.2602193
- Tomlinson, R. (1998). The six principles for effective OR - Their relevance in the 90s. *Journal of the Operational Research Society*, 49(4), 403-407.
- van de Water, H., Schinkel, M., & Rozier, R. (2007). Fields of application of SSM: a categorization of publications. *Journal of the Operational Research Society*, 58, 271-287. doi: 10.1057/palgrave.jors.2602156
- White, L. (2006). Evaluating problem-structuring methods: developing an approach to show the value and effectiveness of PSMs. *Journal of the Operational Research Society*, 57, 842-855. doi: 10.1057/palgrave.jors.2602149
- White, L. (2009). Understanding problem structuring methods interventions. *European Journal of Operational Research*, 199(3), 823-833. doi: 10.1016/j.ejor.2009.01.066
- White, L., Burger, K., & Yearworth, M. (2016). Understanding behaviour in problem structuring methods interventions with activity theory. *European Journal of Operational Research*, 249(3), 983-1004. doi: 10.1016/j.ejor.2015.07.044
- White, L., Yearworth, M., & Burger, K. (2015). *Understanding PSM interventions through sense-making and the mangle of practice lens*. Paper presented at the 15th International Conference on Group Decision and Negotiation (GDN 2015). Vol. 218. Lecture Notes in Business Information Processing, Warsaw, Poland. doi: 10.1007/978-3-319-19515-5_2
- Winter, M. (2006). Problem structuring in project management: an application of soft systems methodology (SSM). *Journal of the Operational Research Society*, 57, 802-812. doi: 10.1057/palgrave.jors.2602050
- Yearworth, M., & White, L. (2014). The non-codified use of problem structuring methods and the need for a generic constitutive definition. *European Journal of Operational Research*, 237(3), 932-945. doi: 10.1016/j.ejor.2014.02.015
- Yearworth, M., & White, L. (2018). Spontaneous emergence of Community OR: self-initiating, self-organising problem structuring mediated by social media. *European Journal of Operational Research*. doi: 10.1016/j.ejor.2018.01.024