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Development of a Collaborative Design-focused Research Approach for Interagency Cooperation Addressing Youth Anti-Social Behaviour in Rail Environs

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Introduction

This paper describes the development of a new design-focused research method. This new research method was developed for, and utilised in, a research project supporting the design and evaluation of interagency collaboration in developing constructive responses to anti-social behaviour by young people in rail environs. This one-year multi-agency research project was jointly funded by the Office of Crime Prevention, the Passenger Transport Authority, and four metropolitan governments in Perth, Western Australia.

The research project required the development and evaluation of a collaborative design-focused research method appropriate to a context of establishing new organisational collaborations between State Government, local government service, not-for-profit and commercial bodies. These organisations have diverse goals and priorities, and no history of working together. All participants, however, expressed an interest in being part of a process of developing strategies and interagency collaboration to develop improved constructive responses to problems of anti-social behaviour.

For this project, Checkland's Soft Systems method (refs) was extended and shaped within a collaborative design process framework. The details of the method evolved after discussion with researchers at the Management School at Lancaster University, Lancaster, UK. Lancaster University Management School was where Checkland's Soft Systems Method originated and since then it has been a focus of its practice.

Methodologically, the research comprised two components:

- A design-focused research process involving collaborative data gathering and design of interagency strategies and collaborative interactions.
- A practical trial of the interactions with subsequent evaluation.

These two components were repeated in each of four target locations.

This paper describes and evaluates the first of these components: the development of the design-focused research approach used in the project and its real world application in four contexts. The second component will be described and evaluated in a later publication.

This paper has five parts:

- This introduction and overview
- A detailed description of the problem context including the forces and factors shaping the development of an appropriate design-focused research process
- A description of the development of the design-focused research process used in this project
- A description and critical assessment of the practical application of the design-focused research method
- Conclusion including lessons learned

Overview of Research Problem Context

The details of the research problem context are complex because they combine multiple unknown and situation specific physical and social factors, multiple agencies with differing missions, conflict, hegemonic issues, and the need for successful interagency cooperation for success.

The geographical problem context is the current rail environment of four railway lines along and across the suburbs of metropolitan Perth Western Australia, and a new outer suburban rail line being built in 2006/2007 to the city of Mandurah.

Passenger Transport Authority incident records suggest that there are a variety of contextual factors and hence, a likely need for specific strategies in each context. Four locations, stations and their associated local government authorities were selected based on the number of recorded incidents.

Anti-social behaviour is a serious concern on three of the four existing suburban rail lines emanating from Perth and a potential concern the new rail access to Mandurah. The Mandurah line travels through areas with social and economic problems that are renowned for problematic anti-social behaviour.

At the start of this project, agencies interested in addressing this problem have rarely collaborated. The passenger transport authority (PTA) has Transit Guards (TGs) and security staff responsible for managing anti-social behaviour on the trains and at the stations. Many reports of this anti-social behaviour relate to young people. Outside the stations, varieties of agencies have an interest in improving their responses to anti-

social behaviour by young people. These agencies include shopping centre security, local government community development organisations, youth organisations, the Department of Community Development (DCD), organisations involved in mitigating problems of drug use, family support organisations, education organisations whose remit is young people who are experiencing problems, security firms, youth workers and local government ranger operations where they apply. The Police deal with anything that is criminal as opposed to anti-social.

There are several concerns underlying the drive to identify better collaborative approaches to resolving this problem. In the main, the concerns expressed by the participants are human concerns about the more positive development of the young people being anti-social, and the upset felt by customers of shopping centres, users of the rail transport system and passers-by who are exposed to loud, offensive and provocative youth anti-social behaviour. There is also an economic dimension. In the railway context, problems at specific stations discourage people from using trains. The scale of the problem has made it difficult to establish reasonable retention rates for Transit Guards. It is also a factor in making it difficult to recruit them. Rail environs outside the rail stations and track include retail outlets, small shops and, in some cases, large shopping complexes. Some of these rail environs act as nodes for the gathering together of young people wanting to be in the 'bright lights'. This typically, potentially discourages shoppers from visiting these retails centres and encourages them to reduce the time, scope and financial commitment of their shopping activities.

One issue perceived to be a concern was the potential for young people to be being continually 'moved on' by security agencies with different loyalties. For example, security staff in some shops environments 'encourage' young people to 'move on' if they appear to be being troublesome. Potentially, this leads to a situation in which young people are moved on by rail Transit Guards from inside to outside the rail station – this is usually a shopping environment. They are then potentially 'moved on' from the shopping precinct to streets, local parks etc. Then in this public environment police and council rangers encourage young people not to cluster. This may result in an erratic circulation of young people between station, retail environment, streets and parks. This situation has significant civil liberties and ethical implications. Young people are citizens and their behaviour is not criminal. The behaviour is legal, yet they are being subjected to constraints on their behaviour and movement that are not applied to other citizens in 'public' environments. They have equal rights to any other citizen yet they are being asked to 'move on' because it is felt they reduce the profitability of some private and public organisations. Interestingly, at one of the locations being researched, it was shopping centre management and security staff indicated that their policy was in general to retain young people because they have high disposable income.

Internationally and nationally in Western Australia to some extent with the HYPE program, it has been found that youth workers acting in detached mode as street workers are effective at reducing youth anti-social behaviour in shopping centre environments.

There is a significant difference in role, however, between this research project and the HYPE project. There have been serious concerns in the youth work field about the HYPE program. In particular, these concerns are

in relation to the alignment of the youth work activity with the mission of youth work agencies. Many would argue that in the HYPE process, youth workers are acting as security guards.

The central aim of this research is to provide support for the design of improved interagency collaboration. This research project builds on the international and national experiences in retail environments. It brings together senior managers from key agencies with an interest in addressing anti-social behaviour. The research involves them collaboratively in identifying details of the problem context along with research-based design of interagency cooperation strategies and cooperative actions that use youth workers as part of the solution to minimise anti-social behaviour whilst at the same time supporting young people in their personal development as intelligent citizens.

Development of a Collaborative Design-focused Research Approach to Developing Interagency Cooperation, Strategies and plans

This design-focused research approach was developed as a means of using up to the minute tightly targeted research to ground the design of strategies and plans to address a real world problem. Conceptually, it forms part of a suite of design-focused research methods and approaches developed by Dr. Love a member of the Design-focused Research Group at Curtin University in Western Australia.

The collaborative design-focused research approach developed fro this project was designed to have several characteristics:

- To gather information about each location from representatives of each agency about the agencies perspectives on each rail location.
- Gather information form each agency representative about the broader systemic issues impacting on the problem situation: about the environment, the power relationships, structural ideas of causality, assumptions on which their perspectives and positions are based, perspectives on their relationships with other agencies, ideas about where responsibilities lie, understanding of who are the actors, forces and factors acting on these actors including customers and clients.

The process must somehow bring this information together in an intelligible manner so that it can be presented back to agency representatives as a group in order to support them in understanding the problem and being able to collaborate in the design, implementation and testing of strategies and plans that are successful and that they would be willing to commit their resources to.

The research method must also incorporate a way of trialling the proposed strategies and plans in real situations and evaluating them. That is the research method itself must contain an experimental phase by which the strategies and plans are implemented and tested in a controlled manner in ways that can be evaluated and fed back into the research process.

The research method must itself, as a research protocol or method, have its own processes of evaluation so that the effectiveness and efficiency of its individual elements and the process as a whole can be evaluated, for changes to be trialled and evaluated to enable the successful modification and improvement of the research method. This process of self-evaluation of the research protocol is especially important because this design-focused research approach brings together and builds on research techniques that, although generic, had previously been utilised in a more restricted range of scenarios and disciplines such as Management Science, Operations Research, Organisational Research, Industrial Relations, Action Research and Information Systems Research.

The standard Soft Systems Method (SSM) is predicated on first getting information about a real world understanding (the rich picture) of a problem context. This is then distilled and transformed into a theoretical representation that describes the key factors and actors, their characteristics and the relationships between them. This theory model is represented back to the participants for their identification of practical outcomes. Thus, the SSM process traverses round a circle from real to theoretical and back to real.

Table 1: Soft System Method (Hutchinson, 1997)

The Soft Systems Method	Activities
1. Unstructured problem situation identified	Meet with concerned constituents and obtain funding
2. Problem situation stated and the development of a rich picture of the problem situation	Meetings with key group involved in the problem situation to identify the main characteristics of the problem situation via a rich picture
3. Development of conceptual models of an idealised system that resolves the problem – based on clear understanding of the clients, actors, transformations, worldviews, system ownership, and environmental contexts and root definitions of the processes	Researchers/consultants study the rich picture to develop a conceptual model and root definitions of activities and processes
4. Compare ideal system with reality as identified in rich picture	Present conceptual model with group of constituents to compare ideal situation with real situation
5. Identify feasible and desirable changes	Meetings with constituent group to identify strategies for improvement and plans for changes
6. Undertake action to improve situation	Implement changes
7. Return to step 1 and redo the cycle	Meet with constituent group to evaluate new problem situation and follow SSM process again until problem resolved satisfactorily

This project broadly follows the above SSM pattern. The differences reflect the difference in application. Details in Hutchinson's (1997) description reflect his interest in organisations focusing on information management in which business processes are primarily routine and can be relatively easily idealised via root definitions. In addition, SSM has more commonly been used in single organisations, in contexts in which it is

assumed that all constituents are happy to act together to resolve the problem. That is, that the role of SSM is to help participants understand the problem better.

A key consideration of this project, however, is the power relationship and tensions between different constituency's roles, in particular between the roles of the PTA's Transit Guards and other constituents – other agencies and some groups of young people. In view of these tensions, it was apparent that bring all participants to a single meeting would raise tensions and defensive behaviours – a situation unhelpful to developing the rich picture. Thus, the initial data gathering for the rich picture was undertaken via a single meeting with the PTA representative that covered all four locations, and four individual focus group meetings with the key agencies in each of the four rail environ locations. The full details of the research approach are shown below in Table 2.

Table 2: Design-focused Research Protocol based on the Soft System Method outlined in Table 1 above.

Design-focused Soft Systems-based Research Method	Activities
1. Unstructured problem situation identified	Contact concerned constituents outline potential research project, bid for and obtain funding
2. Problem situation stated	Distillation of problem into a single project.
	Identification of tensions, hegemonic issues, and conflicts likely to compromise the development of a fully representative rich picture.
	Identification of two main factions (PTA and other agencies) and plan to identify two rich pictures for each location.
3. Gathering information for the development of a rich picture of the problem situation with PTA	Meetings with a key representative of the PTA directly involved in the problem situation to identify a rich picture of the main characteristics of the problem situation in each of the four locations and across the rail network. This was done with a single meeting. The information was gathered by notes taken at the time, by recording the meeting, and by debriefing involving the whole research team undertaken immediately after the meeting.
4. Gathering information for the development of a rich picture of the problem situation in each of the four locations with representatives of key agencies involved in each location.	Identification of key agencies involved in the problem situation in each of the four locations. A focus group meeting in each location with representatives of these key agencies to identify a rich picture the main characteristics of the problem situation in each of the four locations. This was done with four separate meetings. The information was gathered by notes taken at the time, by recording the meeting, and by debriefing involving the whole research team undertaken immediately after the meeting.
5. Distilling the 'rich picture information' from the meetings into a structured representation of the problem situation in each location – making visible the clients, actors, transformations, worldviews, system ownership, and environmental contexts	The researchers set out the data for each location, remove redundancy, clarify inconsistencies, group into significant themes, and identify main points using CATWOE framework.

(CATWOE)	This theoretical representation of the rich picture information is made into visual presentation using colour to distinguish the different aspects (single page and multi-page documents, and idea map).
6. Compare distilled version of the rich picture of each location with reality as seen by focus group members of that location, and identify strategies and plans to improve the problem situation at each location	Present distilled conceptual version of rich pictures of each location to a focus group at each location that includes both PTA representatives and representatives of key agencies from that location. Focus group members discuss problem situation via conceptual picture, which is more comprehensive, less confusing accessible and emotionally less charged. Focus group members collaborate to identify best strategies and operational plans involving interagency integrated collaboration that utilises the benefits of detached youth work
7. Undertake action to improve situation	Implement pilots of interagency collaboration strategies and plans at each location using part-time contract youth work staff. Undertake ongoing evaluation of these four pilot projects using critical incident analysis, reflective journals and evaluation of dynamics of incident data.
8. Undertake final evaluation of project	Meet with focus group members in each location to review the project. Write final report.
9. Dissemination of research findings	Disseminate research findings about project outcomes, successful strategies and operational plans, analyses, and collaborative design-focused research method.

Critical Assessment of the Practical Application of the Design-Focused Research Method

The current evaluation of the design-focused research method described in this paper spans stages 1 to 6 in the process outlined in Table 2 above. Evaluating each of these six stages provided insights into positive and negative aspects of the practical implementation of the research methodic. The key issues are outlined below with a short discussion of the issues.

1. Identify problem situation: This particular problem situation was relatively obvious as a key issue in Perth's urban environment. Three distinct problem areas were initially identified: a) youth anti-social behaviour on the trains themselves; b) identifying precursor behaviours that would enable time for early intervention; c) youth anti-social behaviour at and around nodes on the rail network.

2. Problem situation stated: In submission of a successful application of funding to the Office of Crime Prevention (OCP), we decided to focus on the third option, although all three options were worked up into successful 'expressions of interest' (EOI). One aspect of learning was that our approach to the second option was relatively technical and after making it public through the EOI process, we were surprised to see the ideas quickly emerge in a very similar commercial project involving a participant in the research process. There was a lesson in this to manage early research ideas as valuable intellectual property. There is not yet a formal structure in the current design-focused research method to manage intellectual property except in so far as is

found in the ethical aspects of good research practice in terms of managing information revealed by the participants.

A key part of the problem stating aspect of this process was the identification of interagency tensions. A process that was trialled in this project was to initially separate the two factions in order for both to independently produce their own rich picture information. For each of the four locations, these two rich pictures distilled together into a single representation of the problem situation at each location. This was successful in several ways. It removed the potential that participants either would avoid contributing fully or would engage in unproductive argument. It allowed some limited triangulation of information. It also revealed some of the subtler aspects of differences in institutional perspective that shaped how the problem situation and the roles of participants were seen in each location.

This latter emerged as a key point of understanding for researchers and participants. Different agencies have different missions, these shape their perspectives, and in particular, how they define the limits of the roles of their representatives in the field. This was an important issue as it was easy to criticise, e.g. of youth workers for not having a security role or Transit Guards for not undertaking youth work with young people.

3. Gathering information for the development of a rich picture of the problem situation with PTA: The PTA is an unusual element in the problem situation for six reasons. PTA Transit Guards play a key role in the management of anti-social behaviour on the train and rail property:

- They operate across the rail network
- Their actions are often subject to criticism by other agencies with an interest in youth
- They have well structured administrative, surveillance and data collecting processes
- The PTA controls the rail infrastructure
- They are the largest agency involved in addressing this problem

It proved to be useful to undertake a single interview with a senior manager with a key role in the problem area because it enable them to create a clear and detailed picture of the PTA's understanding, strategies and actions in relation to youth anti-social behaviour in the rail environment. In particular, by interviewing separately from the other agencies it gave a stronger indication of the balance of the PTA's attention to issues independently of the cuing that would occur if representatives from other agencies were present.

The limitation of interviewing a single representative is that there was no opportunity to look for dissenting or contradictory views within the PTA organisation except for those reported by their representative. It opens up the potential for a criticism of bias or overly limited information. It allowed, however, the interviewee to be more candid than they might have been with potentially hostile member of other agencies present.

In terms of a design-focused research approach, this strategy of using separate initial information gathering processes facilitates the collaborative process where agencies representatives feel that the picture presented by other agencies is accurate and trustworthy enough to be used in designing interagency collaborative solutions.

4. Gathering information for the development of a rich picture of the problem situation in each of the four locations with representatives of key agencies involved in each location: Using a focus groups meeting for each location, this demonstrated that the problems were situation specific rather than generic. This was also supported by the fact that the mix of 'key' agencies at each location was different and the details of the underlying problems they focused on were qualitatively and quantitatively different. In addition, the agencies understanding of the problems in most cases aligned strongly with the PTA understanding. In one case, the understandings were different but entirely explicable in terms of the control and power aspects of the situation. These issues demonstrated the value of having a structured process with the epistemological flexibility simultaneously and flexibly to apply across multiple agencies, multiple situations, and multiple perspectives

The downsides to the process were limited and mostly, in these early stages were characterised by focus group members' preference to jump to solutions on partial information or in order to create local suboptimisation of solutions. The effects of this were reduced by facilitation. There was also a time gap between the first and second meetings. This time gap meant that 'solutions' voiced prematurely at the initial meetings to collect rich picture data generally did not prevail at the second meetings, after the group had examined and discussed the distilled data.

5. Distilling the 'rich picture information' from the meetings into a structured representation of the problem situation in each location – making visible the clients, actors, transformations, worldviews, system ownership, and environmental contexts (CATWOE): It is at this point that this design-focused research approach into developing interagency collaborative outcomes deviates most clearly from the traditional Soft Systems research method. It does so in several ways. In SSM, the participants create the rich picture and the researchers create conceptual models and root definitions from that rich picture. In the research method described here, the researchers distil the participants' descriptions of the problem situation into a coherent representation (which includes contradictions where found). The aim of both research processes is similar: to present back to the participants a codified, holistic trustworthy representation of the problem situation that can be used as the basis for identifying strategies to improve it.

The multi-agency nature of the collaborative process requires that this representation should be equally easily accessible from within all the different perspectives, and that it can represent a complex web of sometimes-contradictory details. A word-based representation was the only approach that fulfilled these requirements.

The CATWOE approach was sometimes problematic in this context. CATWOE, as part of SSM, has been developed over time mainly for use in the context of resolving systemic problems involving people in single large-agency situations (ref). Epistemologically, the systemic elements scoped by CATWOE (Clients, Actors, Transformations, Worldviews, Ownership and Environment) intrinsically apply to all systems to give a complete picture that exposes the main characteristics of those systems as they pertain to their management. Some aspects of CATWOE, however, such as 'system ownership' do not translate well into mixed public-private situations involving a variety of constituencies, stakeholders and agents such as addressed in this

research. It raises challenging issues that must be addressed elsewhere such as 'Does any constituency own the right to control agencies' actions in regard to managing anti-social behaviour in shopping precincts (usually private) or public streets?' Potentially, these control issues bound what is possible. In reality, in this project, the enthusiasm for collaboration between agencies means that these issues did not surface. In other projects, with high levels of conflict between participants, the system ownership issues might need a greater focus and perhaps need to be addressed methodologically in a more specific manner.

In practical terms the application of the CATWOE basis for gathering information used in this research revealed much more information about the broader systems issues than would be found by a typical ad-hoc non-systemic research approach. Revealing these systemic aspects appeared to contribute strongly to the ease in which individual agency representatives appreciated and understood the roles of other agencies and were enabled in seeing potential and possibilities for successful collaborative strategies. The use of the CATWOE-based methodic for data gathering in this and similar socially complex contexts offers the opportunity for the development of an improved tool for multi-agency application of Soft Systems approaches.

The application of root definitions was similarly problematic to that of Ownership. The traditional SSM concept of root definitions was grounded in the idea that business sub-systemic processes can conceived as a simple single statement that represents their core or 'root' functionality. In complex social system interactions involving multiple agencies, this is not obviously true. During the meetings with agencies, it became obvious that it was, however, important to distinguish between roles, particularly as conceived by the relevant agencies. For example, it became obviously beneficial to avoid youth workers being regarded as security professionals and vice versa. This, conceptually, is the germ of the basis required for identifying and applying 'root definitions'. It may be that further development will offer opportunity for 'root definition to be as useful in multi-agency application of Soft Systems approaches as it is in more traditional contexts.

6. Compare distilled version of the rich picture of each location with reality as seen by focus group members of that location, and identify strategies and plans to improve the problem situation at each location

Using a word-based representation of the problem situation worked well if the information was incorporated on a single page and easily readable. Positioning information over several pages was not helpful as participants focused on a page at a time. A mind map approach was tried. The complexity of the problem resulted in the map being detailed in a small 8pt font and was rejected on that basis by participants. Distilling a representation of the rich picture information onto a single page separated into themes using colour seemed effective (see, Fig 1)

Figure 1: Example of representation distilled from rich picture information

The key issues to emerge across all the locations in terms of strategy building aspects of the process were:

- The importance of group facilitation skills to achieving outcomes
- Satisfactory group dynamics
- Satisfactory group composition

These effects were strong enough to suggest that perhaps an additional step needs to be added to this design-focused research process. The design focused research process requires particular attention to participant selection, in a similar manner to the care that must be taken in other forms of research to choose participants carefully to minimise bias and wasted time, and maximise the quality of information from data gathering.

Conclusion and Lessons Learned

This paper reports the development, trialling and evaluation of a design-focused research methodic for collaborative design of interagency strategies and cooperative interactions to reduce anti-social behaviour by young people in rail environs.

Methodologically, the research comprised two components:

- A design-focused research process involving collaborative data gathering and design of interagency strategies and collaborative interactions.

- A practical trial of the interactions with subsequent evaluation.

This paper has described an evaluation of the first of these components. There are a number of findings.

Firstly, this fist stage of this design-focused research method has been effective and efficient. It has provided an accurately targeted process for researching the background data in ways that minimise bias, gather accurately targeted data from key constituents in an ethically sound manner, develop theoretical models by distillation and analysis, and report and disseminate the data in an appropriate theoretical form.

Lessons learned:

- It has been effective to undertake initial data gathering by first separating groups whose relationships are marked by power issues, tension and hegemony.

- The SSM-like use of the CATWOE model as applied was significantly more effective than an ad-hoc approach that would tend towards simple conceptualisation, blaming and early move to inadequate solutions (on this issue, see, for example, comments by Forrester (1971) (ref)). The use of the CATWOE structure revealed more information and encouraged participants to break away form prejudiced or culturally determined perspectives on the problem. It also encouraged an understanding of the roles of other agencies.

- Representation of initial data back to participants in theoretical form is not straightforward. For single meeting arrangements, the theoretical representation/distillation of the data must be reduced to that which can be easily cognised. A single A4 sheet seems to be about the limit. It appears that colour-coding text is helpful. Using a mind map type of pres4entaiton of issues did not appear to be useful.

- There is a possible scope for a replacement for the SSM technique of distilling a root definition through an input by the researchers/system analyst about the main processes going on. This was done informally in this trial. The impression gained from this trial is that it may be possible and helpful to formalise this researcher input. For example, the research may deduce from the initial focus group data that the primary issue reported in the data is improving the relationships between youth work agencies and Transit Guards. It may be better to make explicit issues such as this that are clearly identified by the researchers while investigating the rich picture, rather than leaving them for to participants to infer. This is a feature specific to undertaking a design-focused approach rather than a simple research approach.

The Authors

Drs Love and Cooper have experience in Systems Analysis approaches to research, with Dr. Love also having a background in devising and evaluating design methods.

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