

# Improving regional policing: a review of protective services. Undertaking an audit of a method of analysis using soft systems methodology

**Brian Wilson and Kees van Haperen<sup>†</sup>**

(Both) Koios Group, 1–5 Stud Offices, Redenham Park, Redenham, Andover, SP11 9AQ.

<sup>†</sup>(Corresponding author) Tel: +44 (0)7787522196; Fax: + 44 (0)1264774009; email: kees@koiosgroup.com

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***Kees van Haperen** is a founding member and Managing Director of the Koios Group and has been Chairman of the Board since February 2004, whilst continuing his involvement with 'Strategy and Change' consultancy assignments. He has over 15 years of experience in strategy-making, management of change and programme management for a wide spectrum of public and private customers. After a decade as an officer in the Royal Netherlands Air Force and a period of involvement with decision-making and organisational learning in crises, his more recent engagements have been concerned with making sense of complexity and uncertainty in stakeholder-rich situations. His work has focused on defining common purpose and desired outcomes, and implementing all means required to achieve these. In addition, his work has concentrated on exploring how to improve business performance by doing things differently eg, through the introduction of innovative and collaborative working practices and technologies.*

***Brian Wilson** left the world of nuclear power engineering and control systems design in 1966, to become a founder member of the Department of Systems Engineering at the University of Lancaster. During his time at the University he was involved in the development of a particular form*

*of business analysis known as soft systems methodology (SSM). This development was driven by the action research programme carried out in that department, in which his particular interest was the application of SSM to information and organisation-based analysis. The work appeared in the book, *Systems: Concepts, Methodologies and Applications*. He has over 35 years of experience of tackling organisation-based problems of various kinds and has undertaken projects in the pharmaceutical industry, the Met Office, the Office of Government Commerce, (OGC), the Ministry of Defence (MOD), the National Health Service (NHS) and a variety of other organisations in both the private and public sector. He has been involved with various policing-related projects including with the West Yorkshire Police and with the Thames Valley Police and also with a regional project with the three Yorkshire forces and Humberside Police.*

## **ABSTRACT**

*This paper illustrates how soft systems methodology (SSM) was used in undertaking an audit of an analysis method — Micro-Analysis — for improving effectiveness and efficiency in a particular area of policing known as 'protective services'.*

*The authors were asked to support the Regional Project Director tasked with exploring options for collaboration between North Yorkshire Police, South Yorkshire Police, West Yorkshire Police and Humberside Police. SSM was used to develop a reference model relevant to protective services which, together with information categories for each of the SSM activities and conceptual measures of performance, was used to analyse the efficacy of Micro-Analysis by comparing and contrasting information content. The paper further explains the importance of the use of other techniques and tools to overcome the information richness and to meet the need for flexibility of data representation. Finally, the paper reflects on the deliverables and achieved outcome of the project and suggests some further application of the approach.*

## INTRODUCTION

A review of policing in England and Wales has been on the political agenda for some time. In November 2003, the then Home Secretary David Blunkett hinted at a possible restructuring of policing in England and Wales which could see smaller forces giving way to larger, 'strategic' forces. In November 2005, the then Home Secretary Charles Clarke announced restructuring proposals reducing the number of police forces in England and Wales from 43 to 12 (British Broadcasting Corporation [BBC], 2005).

These plans have had varying degrees of support among police officers' organisations. In August 2004, the Police Superintendents Association stated its belief that the existing 43 police forces of England and Wales were based on outdated boundaries and structures and called for reform of the police service in its official response to government plans. However, the Association of Chief Police Officers (ACPO) did not favour such moves (BBC, 2004).

Finally, in June 2006 the efforts to merge forces were called off and the attempts to

create larger forces ceased. Instead, Tony McNulty, the then Minister responsible for policing, was exploring ways to improve effectiveness and efficiency of the forces through intensive collaboration in a particular area of policing known as 'protective services' (McNulty, 2007).

This paper discusses the review of the analysis method — ie, 'Micro-Analysis' — mandated for analysing threats, and the availability and suitability of policing assets in the context of these threats. Although the 'Micro-Analysis' method is based on information from each individual force, it should look at implications for the forces in a regional context. In short, the approach seeks to determine whether excess capabilities within forces exist and whether these could be used to overcome shortfalls in the area of other forces.

Early in 2007, the authors were invited by a representative of West Yorkshire Police to assist in the analysis of four forces in the region covered by Yorkshire and Humberside. Early views of the proposed Micro-Analysis method had raised some concerns about how consistently it could be applied in isolation by individual forces. For instance, it was feared that the definition of what comprises each protective service and the 'how' of its delivery would differ from force to force, and without a clear definition of purpose and activities associated with each area, the responses would lack consistency, thus preventing aggregation and meaningful interpretation.

One of the authors had worked with this representative before on a number of other projects using soft systems methodology (SSM) (see Wilson, 2001). It was suggested that, in this situation, the early stages (and possibly later ones) could be better informed by the application of SSM as well. An acceptable definition of what constitute 'protective services' would enable the identification of required activities, which could

then be used by forces to guide their assessments, thus providing consistency and a common language. Forces would then be able to make an assessment of all the available 'assets' to support the service area within their force (irrespective of 'how' they would be delivered locally).

This paper will firstly give a brief overview of the issues surrounding the policing review and will focus in more detail on the particular aspects of 'protective services'. This is followed by an explanation of the SSM approach, the development of a conceptual model which was used as a framework for analysis, together with the use of information categories to evaluate the Micro-Analysis approach. Since an analysis of this type across four organisations provides a rich source of information, views and perspectives, it is believed that, without some expert software tools, analysis is rendered too complex to structure problems effectively. To organise the depth of information, the authors decided to use a modelling software known as Mood,<sup>1</sup> and applied system engineering principles. A section has been included on the use of software tools and modelling principles. Finally, the paper reflects on the work to date and the benefits that have arisen from the audit and application of SSM.

### **BACKGROUND PROTECTIVE SERVICES AND THE FOUR FORCES**

In October 2005, following David Blunkett's earlier suggestions, the Home Office finally set the police service on course for 'voluntary' regional mergers in order to bridge a perceived gap in its ability to provide what are termed 'protective services'. In brief, these are the police specialisations that are above and beyond the day-to-day services provided to local communities — things that not all forces have the ability to provide (or the need to provide).

The protective services assessment was to involve evaluating the viability of the option to support the delivery of protective services to nationally accepted standards. It was advised that an expert panel of senior managers with professional knowledge in the seven service areas should undertake this assessment. The seven service areas are defined by ACPO and subject to national assessment by Her Majesty's Inspectorate of Constabulary (HMIC), namely:

- serious and organised crime
- major crime
- civil contingencies and emergency planning
- critical incident management
- counterterrorism and allied matters
- public order
- strategic roads policing.

The HMIC report, *Closing the Gap* (HMIC, 2005) detailed the case for major change in the delivery structures for the police service, concluding:

The police service needs not only to deal effectively with volume crime, the current performance focus, but also have demonstrable readiness to tackle complex, volatile threats to individuals, neighbourhoods and businesses. This implies a major development in capability and to achieve this change must be made not only to the structure, but the whole configuration of policing at this level.

At the end of 2006 and early in 2007, it was still perceived that the provision of services needed to improve in all areas so that there would be sufficient capability to respond in all parts of the country. In 2005 the intended solution had been for forces to merge into sufficiently large bodies to be relatively self-sufficient in the protective services. The plug was pulled on mergers in

June 2006 and in their place came an encouragement to 'collaborate' in order to bridge the gaps. Not much had happened since, although some work within the Yorkshire and Humberside region had progressed to start to work on two of the protective service areas to see how they could be better joined up.

In February 2007, Tony McNulty sent out a request for each force to submit an assessment of each of their protective service areas so that he could determine the best option for service provision (eg, locally, regionally or nationally etc). He argued that there was a powerful drive for joint working, but warned that in addition to those threats which should be addressed on a cross-border basis, some authorities and forces might not be able to meet their protective service needs without fundamentally changing their business processes. To help with the analysis, a decision had been made to employ an assessment model developed by North Yorkshire Police referred to as 'Micro-Analysis'.

Each of the four forces in the region is very different, and their characteristics range from highly urbanised policing to policing in rural areas. Humberside has a population of almost 900,000 people and has four operational commands aligned with unitary authorities and local crime and disorder reduction partnerships. West Yorkshire forms the largest conurbation in the Yorkshire and Humberside region, with a diverse population of 2.1 million people, 11 per cent of whom are from black and minority ethnic backgrounds. There are 10 territorial divisions within West Yorkshire, which are aligned to the five local authority and crime and disorder reduction partnerships. South Yorkshire has a population of approximately 1.3 million people, of whom 5 per cent are classified as belonging to a non-white minority ethnic group, the majority of whom are resident within the

Sheffield area. There are four crime and disorder reduction partnerships in South Yorkshire: three are in line with districts, while the Sheffield partnership covers two districts. North Yorkshire Police covers England's largest county, with an area of 7,700 square kilometres. It has a population of 765,000 people. The force comprises three area command units aligned to the local government structures of North Yorkshire and the unitary authority of York (HMIC, 2006).

### **SOFT SYSTEMS METHODOLOGY**

SSM was developed to tackle organisation-based problem situations that are highly complex and subject to the multiple interpretations or perceptions of the people involved. Thus it is essentially an approach for structuring messy, uncertain and ambiguous situations so that other approaches and techniques can be brought to bear to arrive at 'solutions' that are capable of implementation within the cultural environment specific to the situation (Checkland, 1980; Checkland & Wilson, 1981; Wilson, 1990, 2001).

Essentially, SSM makes a conscious distinction between the messy and complex bit of the 'real world' (which is the subject of some form of investigation) and a reference (conceptual) model, which is used to structure the investigation. The reference model is a systems model, in which the activities could be undertaken by people and which can be argued to be coherent. It is derived by, first of all, defining a purpose (or purposes) relevant to the bit of the real world of interest and by then describing 'what' must be done to achieve the purpose (or purposes). The translation of the defined purpose into the activities (ie, the 'what' must be done) uses logic only and leads to a defensible model of a purposeful activity system, which can be shown also to be

coherent. This becomes a very powerful device for investigating situations which can be anything but coherent. As the reference model is explicit, it forms part of the complete audit trail for the investigation providing total defensibility of the approach.

Other developments have also enabled the basic concepts of SSM to be applied to a wide variety of situations such as the specification of information requirements to support organisation-based areas of activity, performance information specification, and strategic review, together with the use of an 'enterprise' concept with particular relevance to the initial analysis stages leading to an 'information architecture' for an entire organisation.

The application described here is of the nature of a strategic review but is related to an exploration of opportunities for collaborative working within 'protective services' across the Yorkshire region, involving the police forces of North, West and South Yorkshire together with the Humberside Force. Within the North Yorkshire Police, a method of analysis had been pioneered — known as 'Micro-Analysis' — which aimed to match police assets to threats. As part of the current work, it was required that an independent challenge of Micro-Analysis should be undertaken and the use of SSM was seen as an appropriate vehicle for mounting this challenge.

### THE OVERALL APPROACH

The development of the reference model to be used in a review of this kind is based upon a simple, but well 'tried and tested' concept for any enterprise (Wilson, 2001). The authors have been widely using it in SSM-based strategic review and change management projects as an aid to capture the extent of the organisational richness and diverse viewpoints. The concept consists of four elements.

- Transformation (T) — the core transformation system that characterises the specific enterprise (see example below) (eg, a system to identify and apprehend those who violate the law)
- Support (S) — a set of support systems that facilitate the activities of the enterprise (eg, a system to match human resource capabilities to requirements)
- Linking (L) — a set of linking systems that provides the necessary interfaces between the enterprise and its environment (eg, a system to deploy police resources within a community in order to provide community well-being)
- Planning, Monitoring and Control (P, M, C) — a system to provide the adaptation required by the enterprise (through planning, monitoring and control) to cater for internal and external changes (eg, a system to assemble and execute development plans for the provision of police services to meet the changing threats within a community with a performance that achieves community expectations).

A fifth element — Knowledge Base (K) — is sometimes added as a system to provide the information and knowledge support to the entire enterprise.

Definitions of purpose (known as root definitions) were developed for each of the above elements and for the police review a total of nine were used. These were formulated during workshops attended by representatives of all four forces. One of them has been included as an example and is shown below.

T — A system operated by police in Yorkshire and Humberside in association with partners and others as appropriate, to establish and maintain community well-being (perceived and actual) in

terms of security of people and property (both permanent and transient), by seeking to prevent various degrees of unlawful and anti-social activity exhibited by groups and/or individuals, together with other potential disruptions, but identifying and apprehending those who violate the law and delivering them to the appropriate judicial authorities, while meeting social expectations and local and national economic requirements and acting within the accepted norms of behaviour and local constraints.

The reference model was developed from these nine definitions and resulted in about 250 activities, connected together by logical dependencies. Since a model of this complexity is difficult to demonstrate to the workshop attendees, it is initially broken down into subsystems which can be used to explain the model structure. This representation is given in Figure 1, where each subsystem is connected to others by the major deliverables.

The 17 subsystems are concerned with all those activities that are necessary to achieve the set of purposes defined by the 'Enterprise' model (Figure 2). The activities define *what* has to be done and each one of these can be used to explore *how* they are currently done, by whom and by using what support information. Since the model is independent of any organisational arrangements, each individual force can be mapped on to the model as well as the region as a whole.

Thus the review can be carried out by assessing how well each activity is currently performed in terms of its efficacy and its efficiency. Current gaps, inefficiencies and potential for improvements form the basis of the strategic review leading to the options for change within each force or options for collaboration amongst forces. The information to support each activity can also be derived and compared against

existing IT systems in order to define 'information gaps' and duplications/inconsistencies.

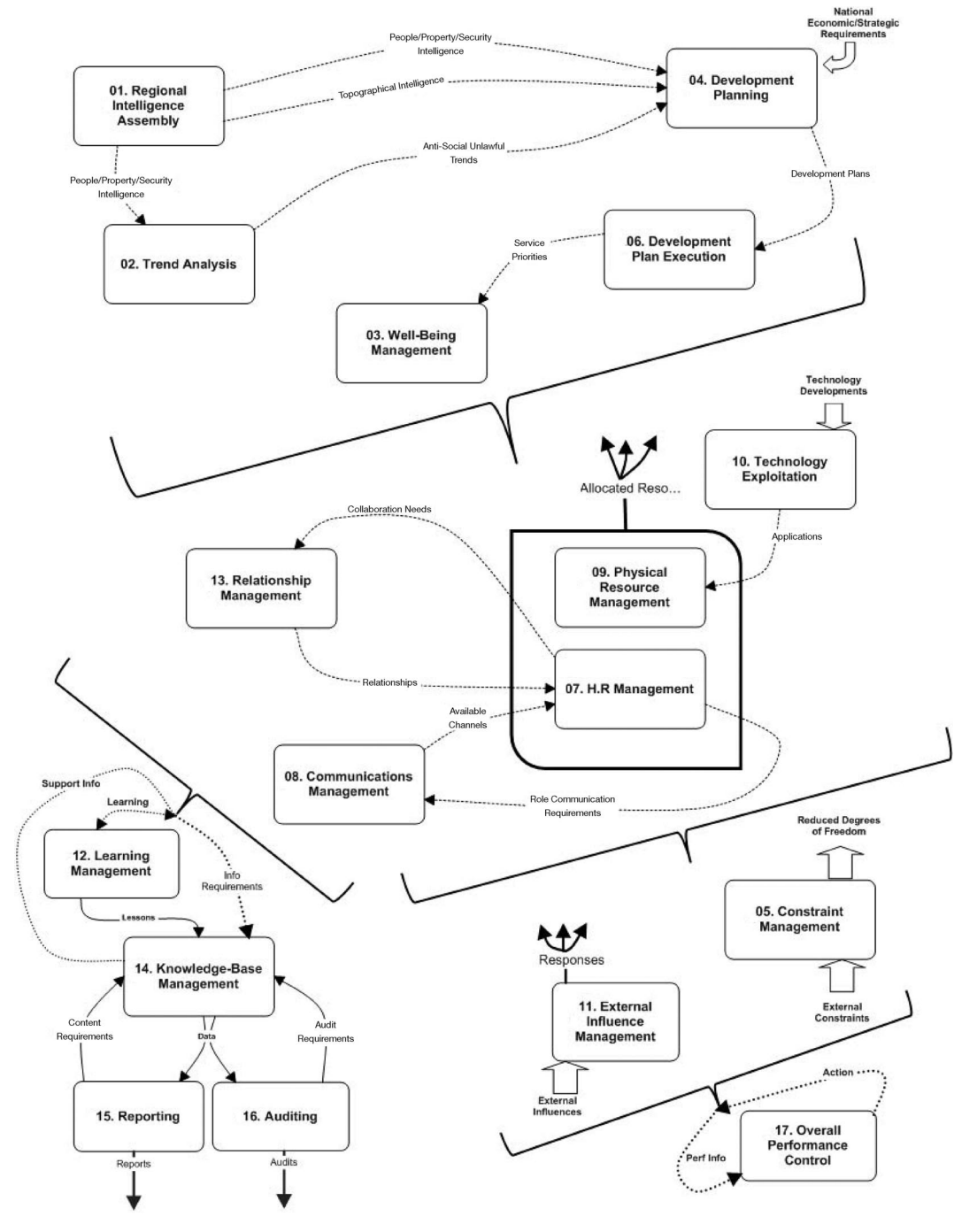
The above analysis is concerned with the ongoing activities that need to be in place in order to achieve the defined purpose of regional policing. The model is generic in the sense that it represents the delivery of those services required to provide community well-being over time and recognises the changes that occur to the community and the threats placed upon it. Comparison of this model against current police activity in the provision of protective services across the region will lead to those strategic changes that could form the basis of implementation plans both within individual forces and through collaborative arrangements.

Micro-Analysis, on the other hand, is only concerned with a snapshot of the current state of match between available police assets of various kinds and the current and potential threats that the region may face in the near future. Thus the two analyses are different in kind and this makes comparison of the two approaches difficult. This difference becomes even clearer when mapping the scope of Micro-Analysis onto the SSM model.<sup>2</sup>

Micro-Analysis can be represented by the following major stages:

- questionnaires are derived and used to assemble information about current assets within a force which are used to supply protective services
- an assessment of threats is produced in the form of threat matrices and these represent the demand for protective services
- an evaluation of the relationship of demand to service availability is carried out using professional judgement in order to assign a priority ranking to any gaps or imbalances in the abilities to supply protective services

Figure 1  
High level model:  
Conceptual capabilities  
relevant to protective  
services



- options for change are then identified, as strategic options, to realise in-force improvements in efficiency or cross-force opportunities for collaboration.

Thus the deliverables of Micro-Analysis match the potential deliverables using SSM, except that the deliverables from SSM could be both improvements in effectiveness as

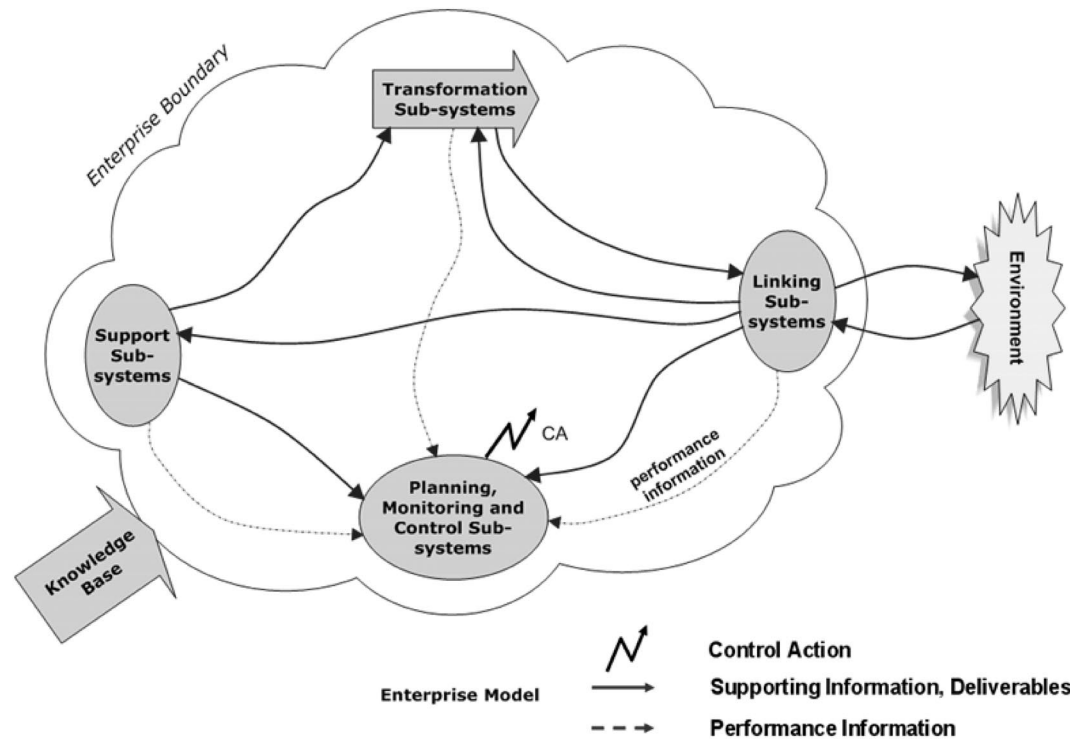


Figure 2  
The Enterprise Model

well as improvements in efficiency. Thus, one way of undertaking comparison of the two approaches could be in terms of a comparison of deliverables. However, this is somewhat time- and resource-consuming. A more immediate comparison was therefore sought which could give some early indication of the scope and robustness of the Micro-Analysis method.

Micro-Analysis is driven by the information derived from the questionnaires and threat matrices. This information is manipulated through defined algorithms to identify, risk assess and develop options to respond to gaps (or imbalances) between assets and threats. The use of questionnaires makes it possible to undertake comparison with the information required to undertake the activities in the reference model. The information categories needed to support the reference model define the total requirements for the ongoing provision of

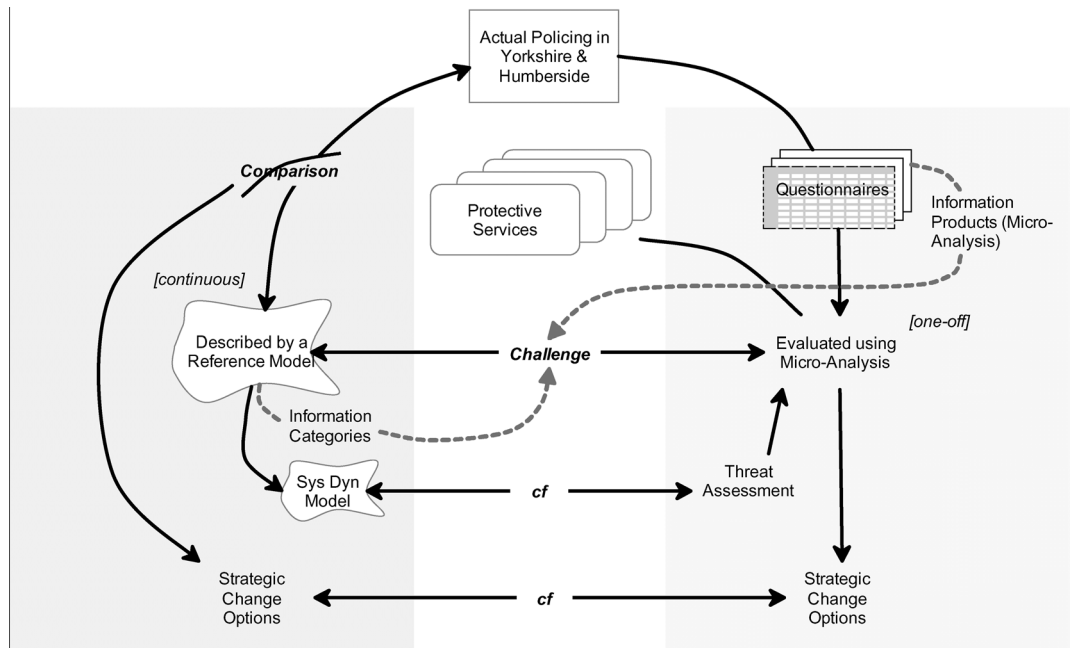
protective services as well as the information categories required to support the remaining police activity. Extraction of the 'protective services' requirement, (termed information categories) and comparison of this with the information collected from the questionnaires, (termed information products) would give an immediate assessment of the comprehensiveness of Micro-Analysis. Robustness can be assessed in terms of the ongoing and adaptive provision of protective services versus the one-off assessment carried out within Micro-Analysis.

This is the method of comparison used and findings are discussed below. A full comparison and assessment of Micro-Analysis was undertaken as illustrated in Figure 3.

The right-hand side of Figure 3 shows the process used by Micro-Analysis and is relatively straightforward:



Figure 3  
Overview of the audit approach



- questionnaires are constructed and used to identify the ‘assets’ used by the force to ‘supply’/provide protective services
- threat matrices are used to collect and assess information about the likely threats/demand for protective services
- professional judgement is used to evaluate and compare assets and threats for each constituent element of protective services and to assign a numerical value to classify the significance of any gaps or imbalances. These gaps are further analysed and prioritised through the identification of risk
- high-level options for change are identified to address gaps (and hence improve efficiency) through in-force improvements and/or cross-force collaboration.

The left-hand side of Figure 3 and the arrows connecting the two sides shows how the SSM-based approach is (and can continue to be) used to underpin the audit and provide an independent challenge to the process used by Micro-Analysis and to the

high-level options it identifies. The left-hand side of Figure 3 and the connecting arrows can be described as follows:

- the SSM reference model (derived from agreed statements of the purpose of policing in the Yorkshire and Humberside region) is used repeatedly for various comparisons of what is happening in protective services and what needs to happen for the police forces to achieve their purpose. Two comparisons relevant to the audit are:
  - comparison of information categories (ICs) required to undertake activities in the reference model with the information products (IPs) derived by Micro-Analysis through use of its asset questionnaires and threat matrices
  - use of the reference model to create a systems dynamics model that can be used to explore the cause-effect interrelationship of different threats and of the use of different assets to meet these threats (note: this comparison

is currently proposed rather than completed)

- differences between what is happening and what needs to happen are assessed to identify strategic options for change that are both desirable and feasible.
- strategic options for change identified through use of the SSM reference model are compared with and used to challenge, underpin and/or extend the high-level options for change identified through Micro-Analysis.

### USE OF SPECIALIST TOOLS AND PRINCIPLES

It was clear at the outset of the project that it needed to be possible to create various representations of the models and different mappings on top of them. After all, we were dealing with four organisations, each with probably its own views of protective services and Micro-Analysis. Moreover, it was decided early in the project that the conceptual model ought to support both a performance-based as well as an information-based review. An SSM model as derived for this work tends to comprise 250–300 activities, each with between four and eight information categories and as many measures of performance. Traditional tools such as MS Word and MS Excel do not provide the flexibility to develop relationships between the various artefacts and objects that can be explored in a variety of ways. It was therefore necessary to use a data base tool known as MooD which has been used for SSM modelling for almost 10 years.

This data base was structured so as to organise the information effectively (see Figure 4).<sup>3</sup> This structure is better known as an enterprise or business architecture. The UK Ministry of Defence (MoD) uses this approach for most of its capability projects which have a significant information system component. The MoD has

encouraged its suppliers to embed this thinking in a capability management analysis process, and within the MoD this is supported by a suite of tools of which MooD forms a part. In anticipation that the analysis of protective services should ultimately address the capabilities of the four forces more holistically, it was felt that the initial stages should enable expansion and flexible manipulation.

Because MooD does not ‘calculate’ anything, MS Excel was used for more quantitative analysis. Where in Figure 5, ICs were mapped to IPs, this mapping was exported to MS Excel to determine the degree of mapping of each activity. Similarly, the measures of performance can be linked to real data sources and combined in MooD to create performance dashboards for analysis.

### OUTCOMES OF THE APPROACH

The Micro-Analysis approach, pioneered by North Yorkshire Police (NYP), seems to provide a practical and achievable mechanism to assess a force’s protective services capacity. The authors found that it had enabled NYP to realise significant benefits. The authors nevertheless observed a number of shortcomings with the Micro-Analysis approach.

- It is mainly concerned with identifying numbers of assets and levels of threat and tackling the apparent imbalance between them. Consequently, it only needs and uses a limited set of information.
- It enables forces to identify high-level options for change; however, it is not necessarily the case that these options would be sustainable. If forces require more detailed options, a more comprehensive analysis and assessment will be required. Micro-Analysis provides the foundation for this additional work.

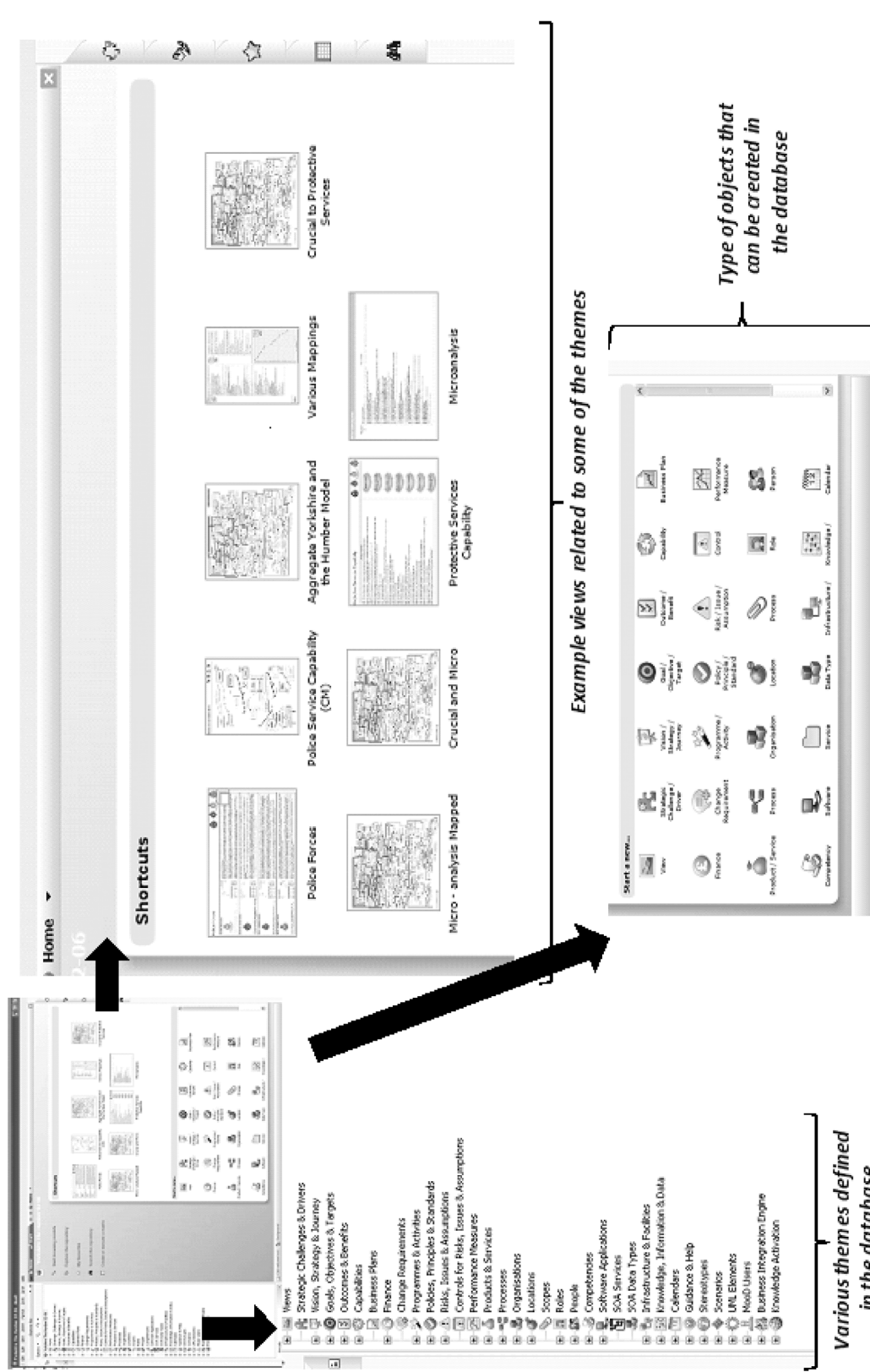


Figure 4  
An overview of the structure of the data base

- One particular limitation of the process is that it has not been designed to assess or improve the performance of activities related to protective services.
- The practical approach adopted by Micro-Analysis means that it relies upon informal collection of information and the extensive use of professional judgement. Consequently, it is unlikely to be repeatable and will almost certainly not be defensible.
- There is no agreed statement of the benefits of using Micro-Analysis.

Following the application of the SSM framework, a number of recommendations were made that could lead to further enhancements and defensibility of the Micro-Analysis approach.

- Assess and improve the quality of information (authorised sources etc).
- If Micro-Analysis is to become a repeatable process and provide sufficiently robust options for change:
  - it needs to be further developed so that it uses more explicit analysis (eg, what-if analysis, systems dynamics models) and is less reliant on professional judgement
  - its current focus on assets and threats needs to be supported by an explicit assessment of the processes involved in deploying assets to meet threats
  - it needs to be supported by a database and/or knowledge-base that enables relevant data and commentary to be stored in a structured way that is easy to analyse, track over time and report
  - it needs to be supported by an explicit strategy to plan and realise benefits.
- Use Micro-Analysis as the first step towards a more comprehensive and

explicit view of assets, threats and risks and their implications for organisational performance to:

- identify alternative ways to meet increased efficiency targets
- support communications with the Home Office around expectations and plans.

### **What has been delivered?**

The application of SSM in this project has resulted in the delivery of a 'reference model' for policing in the Yorkshire and Humberside region. This model identifies the activities that need to be undertaken to achieve the purpose of policing as defined by the Joint Regional Project Team and provides the basis for the work supported by the consultancy. The activities in the model also define logical information needs, which enabled a comprehensive assessment of information collected by Micro-Analysis on assets/resources and threats. Further deliverables include a list of criteria that can be used to measure the performance of activities in the reference model and an audit of the use of Micro-Analysis to assess protective services. The team has also strived to achieve a transfer of skills in the development and use of the reference model to a small group of representatives of each force. However, due to time pressures, the force representatives were primarily focused on the completion of steps of the Micro-Analysis approach. Consequently, the interaction was not as intensive as planned and skill transfer has been minimal.

However, it is perhaps more important to determine the value that the SSM approach has added to Micro-Analysis. It could be argued that the results depicted in Table 1 have been achieved.

It has been suggested that the SSM artefacts could be further used to support the implementation of in-force and regional

**Table 1: Achievements**

<i>Key output of Micro-Analysis</i>		<i>Value that will be added through use of SSM approach (to date)</i>
Stock-take of assets/resources associated with protective services	→	Increased confidence in the accuracy of data on assets/resources
Identification and prioritisation of threats/risks	→	Better understanding of the relationship between resources, threats and risks
High-level options for change	→	Provides a robust approach to the development of specific options for change and thus ensures that high-level options identified by micro-analysis are fit for purpose

change programmes by setting the context for change, enabling the prioritisation of projects and providing a structure to manage and realise benefits. It could also provide a route-map that enables the four forces to achieve the Regional Chief Constables' new vision for policing in the region.

However, it could be argued that the true value of an SSM approach is in the degree of working with problem owners. Therefore, the amount, if any, of additional consultancy will depend on the number of dedicated resources that individual forces can commit to the work and the ability of these resources to own and further develop the work completed to date. If sufficient competent resources are committed, the additional consultancy should be 'light-touch' and, perhaps, limited to skills transfer, facilitation and quality assurance.

It is expected that further work will be undertaken using the reference (conceptual) model and measures of performance to analyse performance in areas relevant to protective services in each of the forces. Furthermore, it has also been suggested to use system dynamics to support the identification of options for change through the analysis of cause and effects between assets

and threats. However, these are the subjects for future papers.

**ACKNOWLEDGEMENT**

The authors wish to acknowledge Paul Ader's participation and contribution to the project, in particular his detailed review of the Micro-Analysis stages, and Edd Raff for his assistance in building the SSM artefacts in the enterprise architecture repository.

**NOTES**

- (1) Mood Business Developer is a database toolset that enables object oriented design and knowledge mapping developed by the Salamander Organisation; see [www.tsorg.co.uk](http://www.tsorg.co.uk) for more detailed information.
- (2) Graphic representations of this process are available from the authors on request.
- (3) The enterprise architecture repository used for this project was developed using the Salamander Business Architecture.

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