



# Police Operational Planning and Crime Detection through Adopting an Information Systems Approach

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## ABSTRACT

*In recent years the introduction and subsequent enhancements of information technology has seen the emergence of major opportunities for developing new approaches to improve information interchange. The provision of information provides opportunities to find resolutions to problem situations, and the power of providing relevant and accurate information through using information systems cannot be underestimated. However, the world of information systems thinking has, so far, experienced difficulty finding a methodology suitable for utilising the full range of available current information technology. This situation in the real world shows itself predominantly as information starvation as current information systems struggle to bring order and structure to information technology developments. This article will discuss the issues relating to the development of a new generic framework. The novel aspect of this generic framework for planning information systems is that it integrates Soft Systems Methodology and Viable Systems Model in a coherent whole, whilst embracing the concepts of self-adaptation and autonomy. Further, the generic framework integrates the spatial analysis capabilities of a Geographical Information System. The generic framework will then be tested in real world problem situations in order to test its effectiveness, efficiency and efficacy with regards to finding suitable solutions to the problem of information starvation. The importance of focusing the framework on GIS functionality is related to the fact that in many organisations GIS is employed as the solution to information starvation because of its ability to display spatial information. This article will demonstrate the implementation of the generic framework in a UK Police Authority, a large emergency service that suffers from information starvation. In the context of a UK Police Authority the combination of Soft Systems Methodology and Viable Systems Model being supported by GIS functionality is seen as being a significant progression in relation to crime detection and operational planning.*

*Keywords:* Generic Framework, Information Systems, Soft Systems Methodology, Viable Systems Model

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## INTRODUCTION

Wide ranges of disciplines, or fields of social science, contribute to our knowledge of organi-

sations and their behaviour. Each discipline has its own approach, or approaches, to description and explanation of organisations. These are set in the paradigms used by communities of researchers. Debate has developed, at an ac-

DOI: 10.4018/jitr.2009062901

celerating rate, about the appropriate nature and strength of the paradigms that underlie the research into business and organisations (McKenna, & Williams, 1997).

Skyrme (1997), argues that to try and apply a single methodology however appropriate it may seem to its proponents, does not reflect the richness, diversity and interdependence of most real-life situations. Therefore a multi-methodology approach, which uses techniques from many other methodologies, would seem to have many attractions.

Real-world problem situations are inevitably highly complex and multidimensional. Different paradigms each focus attention on different aspects of the situation and so combining methodologies is necessary to deal effectively with the full richness of the real world. Methodologies tend to be more useful in relation to some phases than others, so the prospect of combining them has immediate appeal. Even where methodologies do perform similar functions, combining a range of approaches may well yield a better result (Mingers, & Gill, 1997).

In order to develop a framework it is first important to understand the process that is required to undertake such a task. There are two main functions of a self-adaptive system, which must be taken into consideration when developing the framework, which are; the capability to determine '*what*' changes are taking place and '*how*' to take the necessary corrective action. An in-depth literature review has been conducted so as to ensure that knowledge of the field is extensive and comprehensive. It is vital to the development of a generic framework that self-adaptive systems concepts are reviewed so as to take into account current and emerging control structures.

Having gained an understanding of the processes involved it is logical that the next steps to take are the design, implementation and experimentation of the generic framework. To begin with, it must be understood and appreciated that there are numerous theoretical approaches for self-adaptive information systems (Andriole, & Adelman, 1995; Murray-Smith, & Johansen, 1997).

Peter Checkland's Soft Systems Methodology (SSM) (Checkland, 1981; Checkland, & Holwell, 1998; Checkland, & Scholes, 1998) will be utilised to underpin the concepts incorporated into the generic framework. Whilst the soft approach adopted by SSM will allow the framework to determine '*what*' changes are happening to the new information system it will not be able to decide '*how*' to take corrective action if necessary. Because of this, a hard methodology will be employed to control the decision making process that is fundamental to any information system.

In the world of public sector information system development and implementation Prince2 (Rao & Georgeff, 1995) is the Government standard approach. An investigation has been undertaken to determine which hard approach is most suited to the framework being created. Other approaches such as Effective Technical and Human Implementation of Computer-based Systems (ETHICS) and Stafford Beers' Viable Systems Model (Kokar, Baslawski, & Eracar, 1999) have been evaluated. It is essential that the hard approach adopted for the development of the framework must be able to link in with SSM.

## SOFT SYSTEMS METHODOLOGY

The Lancaster Model used in SSM consists of seven stages that allow the analyst to produce recommendations that are better suited to the staff within the organisation concerned. SSM aims to look at the problem situation as a whole rather than just the problem itself (Checkland, 1981; Checkland et al., 1998; Checkland, 1999). For example, SSM would look at an organisation and its staff that cannot gather the information they require, rather than just looking at the IT systems.

- **Step 1: *The Problem Situation.*** This is where the analyst derives knowledge of the organisation, how it works and what the working procedures are at present.

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