



Supporting Crime Detection and Operational Planning with Enhanced GIS

Peter Kinloch

Conference on Geographical Information Systems

Trabzon, 30th October – 2nd November 2007

1



GIS in Police Operations

- Current information systems thinking is having difficulty with modern policing environments
- Examples of current IS methodologies
- Introducing the current difficulties faced by a UK Police Force
- The current practises in using GIS in Police Force
- The importance of GIS in Police operation planning

2



Methodologies

- There is a wide range a disciplines which look at organisations and their behaviour
- Real-world problem situations are complex
- It can be argued that a single methodology may not reflect the diversity of real-world situations

3



Introducing Soft Systems Methodology (SSM)

Two current IS methodologies used in this study

The first methodology is:

- Soft Systems Methodology (SSM) was developed by Peter Checkland
- SSM aims to reduce the complexity of the environment

4



SSM Continued

Using SSM allows us to understand:

- Social and political aspects of the study area
- It is relatively 'soft' approach in IS development

5



Introducing Viable Systems Model

- Viable Systems Model (VSM) was developed by Stafford Beer
- VSM aims also to look at viable systems in problem situation
- Key feature of viable systems is that they are adaptable
- It is relatively a 'hard' approach in IS development

6



The 'Hard' and 'Soft' Approach Dichotomy

- The 'soft' approach adopted by SSM tells the Analyst the 'whats' of the problem situation
- The 'hard' approach adopted by VSM tells the Analyst the 'hows' of the problem situation
- Why can't we have an approach that does both?

7



Linking SSM and VSM

- In SSM the Lancaster Model has the capacity to adopt other systems thinking
- VSM has the capacity to adapt to changes in its environment
- By linking the two together the 'whats' and the 'hows' can be adopted in one approach

8



UK Police Force: A Case Study

- Fifth largest Force in England and Wales
- Employs 4,200 officers and 2,600 support staff

My role:

- I work as Senior Project Team Leader in Force Modernisation Team

9



UK Police Evolving



10



The Current Problem Situation in The UK Police Force

- The Police Information Technology Organisation (PITO) has identified information starvation as a fundamental problem in modern policing

"PITO has identified that police officers either have no information at all, or they have far too much irrelevant information. Either way, an officer today is unable to gather the information they require in a quick and timely manner..."

11



How Can We Help a Modern Police Force?

- SSM and VSM can be both used in an information system
- Information starvation faced currently in the Police Force could be eliminated by combining these two methodologies
- Develop a new information system taking into account the police culture and ensure it has the ability to adapt to change

12



Implementation

- Need to define appropriate information access
- Determine best way to provide officer with the information they need
- Better use of GIS to assist with information provision

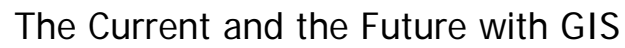
13



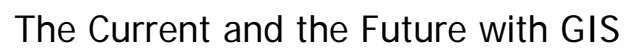
Using GIS in Policing

- GIS is becoming increasingly popular in policing
- However, GIS is not used extensively for crime analysis
- By linking SSM and VSM it is proposed that a new information system can be introduced
- Improved GIS usage and crime analysis should increase the service offered to the general public.

14



- 15





- 18



Operation Preparation

- Linking street maps with aerial photographs
- Implement building footprints for officer deployment plan
- Apply 3D rendering

19



Operation Briefing

- Incorporate 'mug shots' into GIS
- Incorporate intelligence and video clips into GIS
- Apply digital photograph to place photographic images of locations into GIS (e.g. gang hangouts, graffiti and layouts of homes from search warrants)
- Add the capacity to search Force systems through GIS

20



Dynamic Briefing

- Utilise mobile terminals
- Move from a network and workstation environment to a geo-server environment
- Allow geo-queries to take place on the server with the images being sent to the mobile terminal
- Autonomic capacity ensures officers are informed of deployment changes as the operation unfolds

21



Summary

- New approach linking SSM and VSM is on its way
- Information starvation can be overcome
- GIS can be used better in UK Police Forces
- Operation planning can be significantly enhanced through GIS
- Autonomic GIS will lead to dynamic briefing for officers during operation

22



Thank you for your
attention

Any Questions?