Rouwette, van Hooff, Vennix and Jongebreur (2007): Modeling crime control in the Netherlands: insights on process

In this paper a Group Model Building case study at the Ministry of Justice in the Netherlands is discussed. The main aim of the project was "to gain insights into the combined effects of an increase in the case load and investments in different phases of criminal justice administration and contextual developments such as increased complexity of cases". One concrete objective was to develop a usable System Dynamics model in form of a flight simulator to make it possible to experiment with different policy options. Involved people in the project were two researchers and a professor from Radboud University Nijmegen and an external consulting company with specialization on quantitative modeling (= all together the modeling team) and beside that several representatives from the police force, public prosecution, courts and sentence execution (= reference group).

Contiguous to the description of the project one further goal of the paper is to extend the concept of scripts (= repeatable process element which provides similar outcomes) introduced by Andersen and Richardson (1997). Several new script types are discussed at the end of the paper as well.

Problem context

- Safety Program for crime control with four goals:
    1. Lowering the number of reoffenders.
    2. Lowering crime rate without law enforcement. (prosecution gap)
    3. More presence of police in the public.
    4. More attention to prevention.
- Uncertainties in crime control:
    1. Increase of the number of cases: No specification in the program to which crime categories should be put more effort.
    2. Possible investments in capacity: Unknown increase of workload distribution over time.
    3. "Environmental" development: Impacts of developments in Dutch society and especially in the wider European context.
- SD-Project: Simulation model criminal justice chain (SMS).

Phase 1: Conceptualization

- Interviews: Two general findings
    1. Existing Shortage of prison capacity over years → Increased number of early releases.
    2. Three possible reactions to increased workload: a) Increasing efficiency; b) Increasing staff capacity; c) Opening values (= influence the in- and outflow of cases).
- Two general flows: Paper flow (cases) and Person flow (prisoners).
- Indicators: e.g. processing time, processing, quality, delays, idle time in processing cases, early releases, perceived safety, etc.
- Three workshops with subgroup discussions and plenary conclusions
    1. Inflow and outflows, workload, organization contact points.

2. Person flow and reaction of work pressure.
3. Exogenous vs. endogenous variables and indicators.

Phase 2: Formulization

- Role of participants was to comment on structure on behavior and to point to available data sources.
- Formulization phase consisted of four workshops with discussion of the different submodels and iteration stages in between.
- Integration of the different submodels to one model in the iterations.
- Final model was handed out to all participants.

Phase 3: Training and follow-up

- Included model documentation, handover and user training.
- The whole project took more time than budgeted in the project proposal.
- After evaluation, the developed model is stated with high quality.
- Several follow-up SD modeling projects at the Ministry of Justice.

Used modeling scripts

- Audience, purpose and policy options: Identify policy leverage points after clarification of the modeling study.
- Sectors, a top down-approach: Identify key sectors with the participants.
- Capacity utilization script: Elicit feedback structure through comparison of extreme condition states in two level variables.
- Black box means-ends script: Mapping different layers of the stock and flow structure, key outputs and possible policy levers.
- Data estimation script: Asking participants for numerical values individually and comparison of results.
- Model refinement script: Participants can add or comment structure, which was handed out and explained to them.
- Matrix that links policy levers to key system flows: Participants can describe which policy is influencing which (key) variables of the system.
- Scripts for ending with a bang: End group sessions with a positive note (e.g. policy insights, easy to remember chunks, etc.).

Suggestions for new scripts by the authors

- Team of teams script: Assigning each submodel to a principal modeler which is responsible for the structure and coordinated data gathering.
- Concept diagram script: Use of preliminary qualitative CLDs to examine how policies in one part of the system are having unexpected side effects somewhere else in the system.
- Elicitation of nonlinear relation script: Procedure to sketch nonlinear relation between two variables stepwise.
- Putting a stake in the ground script: Let participants predict results of the modeling experiment to foster discussion and interest of the participants.