Computational Modelling of Public Policy: Reflections on Practice

Description

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Gilbert G, Ahrweiler P, Barbrook-Johnson P, et al. (2018) Computational Modelling of Public Policy: Reflections on Practice. Journal of Artificial Societies and Social Simulation 21: 1â??14. pdf copy available

Abstract: Computational models are increasingly being used to assist in developing, implementing and evaluating public policy. This paper reports on the experience of the authors in designing and using computational models of public policy (â??policy modelsâ??, for short). The paper considers the role of computational models in policy making, and some of the challenges that need to be overcome if policy models are to make an effective contribution. It suggests that policy models can have an important place in the policy process because they could allow policy makers to experiment in a virtual world, and have many advantages compared with randomised control trials and policy pilots. The paper then summarises some general lessons that can be extracted from the authorsâ?? experience with policy modelling. These general lessons include the observation that ofen the main benefit of designing and using a model is that it provides an understanding of the policy domain, rather than the numbers it generates; that care needs to be taken that models are designed at an appropriate level of abstraction; that although appropriate data for calibration and validation may sometimes be in short supply, modelling is ofen still valuable; that modelling collaboratively and involving a range of stakeholders from the outset increases the likelihood that the model will be used and will be fit for purpose; that attention needs to be paid to effective communication between modellers and stakeholders; and that modelling for public policy involves ethical issues that need careful consideration. The paper concludes that policy modelling will continue to grow in importance as a component of public policy making processes, but if its potential is to be fully realised, there will need to be a melding of the cultures of computational modelling and policy making.

Selected quotes: For these reasons, the ability to make â??point predictionsâ??, i.e. forecasts of specific values at a specific time in the future, is rarely possible. More possible is a prediction that some event will or will not take place, or qualitative statements about the type or direction of change of values. Understanding what sort of unexpected outcomes
can emerge and something of the nature of how these arise also helps design policies that can be responsive to unexpected outcomes when they do arise. It can be particularly helpful in changing environments to use the model to explore what might happen under a range of possible, but dfferent, potential futures â?? without any commitment about which of these may eventually transpire. Even more valuable is a finding that the model shows that certain outcomes could not be achieved given the assumptions of the model. An example of this is the use of a whole system energy model to develop scenarios that meet the decarbonisation goals set by the EU for 2050 (see, for example, RAENG 2015.)

Rick Davies comment: A concise and very informative summary with many useful references. Definitely worth reading! I like the big emphasis on the need for ongoing collaboration and communication between model developers and their clients and other model stakeholders However, I would have liked to see some discussion of the pros and cons of different approaches to modeling e.g. agent-based

models vs Fuzzy Cognitive Mapping and other approaches. Not just examples of different modelling applications, useful as they were.

See also: Uprichard, E and Penn, A (2016) Dependency Models: A CECAN Evaluation and Policy Practice Note for policy analysts and evaluators. CECAN. Available at: https://www.cecan.ac.uk/sites/default/files/2018-01/EMMA%20PPN%20v1.0.pdf (accessed 6 June 2018).

Category

1. Journal article

Date
24/11/2026
Date Created
11/06/2018
Author
admin