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Managing complex adaptive systems: A resource/agent modelling perspective

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Complex adaptive systems are systems where those managing the system, the agents, interact with other competing agents and key resources available to the system. The behaviour of the agents and the resources are constantly changing over time thus resulting in complex systems of evolving problem configurations. Managing such a system can be very challenging, particularly when attempting to manage rather than simplify complexity. One particular problem is the need to take a comprehensive perspective of the complex system in order to manage it effectively. Resource structure and agent behaviour are interdependent and both interconnected components need to be considered in order to support optimal decision making. Due to the lack of an appropriate technique in the literature to achieve a comprehensive qualitative appreciation of resource/agent complex adaptive system behaviour, we have developed a novel qualitative modelling tool, a Resource/Agent Map, that aims to map and analyse both resources and agents interactive behaviour. We show how this modelling tool can help achieve a holistic appreciation of the resource/agent perspectives and generate scenario alternatives to inform policy decision making in respect to system management and regulation. A pharmaceutical example is used to demonstrate the modelling tool.

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