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## Editorial

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The world is growing increasingly complex, interconnected and fast-changing (Armenia et al., 2014) making the effects of individual behaviour and policy choices unpredictable. As a result, the problems that decision-makers (either in the realm of public policy or on that of private business) face today are complex and dynamic (Sterman, 1989): more than one decisions might be necessary, decisions are interrelated and the environment on which decisions are implemented evolves over time – either as a result of the decision or independently (Edwards, 1962).

Because of these circumstances, more often than not, policies and decisions fail to address the problem for which they were designed, a notion known as policy resistance, where policies are delayed, made weaker or nullified by unintended consequences (Forrester, 1971; Sterman, 2000).

The reasons for policy resistance and failure are multiple ones.

First, the misunderstanding of the notion of complexity. A system is not complex because it is consisted of a large number of components. A system is complex because

- a it is dynamic, thus constantly changing over time
- b it is ruled by feedback, meaning that decisions change the environment, which triggers actions that influence those decisions
- c it is governed by nonlinearities, meaning that cause and effect are rarely linear/proportional and are usually distant in time and space (Sterman, 2000).

The result of dynamic complexity is that delays cause symptoms of a problem to catch the attention of decision-makers and not its underlying cause.

Thus, in order to help decision-makers understanding errors in their judgement and better dealing with those factors that cause policy failure, computer-simulation models have been developed and used (Armenia et al., 2015). These models help decision-makers to understand that a decision or a policy does not merely consist of the presentation of information and the choice, rather it is a *process to move from an unsatisfactory state of a system to a state that is deemed satisfactory* (by the decision-maker) (Ouerdane et al., 2010).

Moreover, a policy should not be an ad hoc, static action based on intuition and unrealistic assumptions. Effective decision making should not be targeted towards trying to predict what the future is. On the contrary, effective decision making must be based on understanding which is the system/environment that we need to change, what is the

change we wish to bring and what is the time horizon for that change. Furthermore, understanding the rationale that explains how a system's behaviour emerges could offer valuable insights on what are those leverage points that (no matter how the future evolves) could be used to design, develop and implement a successful policies.

Finally, it is essential to test the policy beforehand, even in the abstract world of simulation models, because testing can show the points in the system that could trigger counterintuitive effects, bring forth the feedbacks and delays of the system that could dilate the policy and produce an array of the possible consequences that the policy could generate in a safe environment.

Under this perspective, this special issue proposes four original research papers, presented at the Business Systems Laboratory 2015 Symposium (<http://bslab-symposium.net>), held in Perugia, Italy, on 20–21 January 2015, which are all aiming at developing a higher understanding on how policy modelling can be improved and made more effective, especially through the use of methodologies like systems thinking and dynamic modelling and simulation.

More analytically, the article of Federico Barnabè explores the potentialities of system dynamics (SD) as a support to integrated reporting (<IR>) for a more transparent representation of value creation processes as well as strategy design and implementation. In detail, the article presents a simulation SD model and discusses three different scenarios that have been developed by taking into consideration the airline industry's low cost carriers.

Silvestri, Santovito, La Sala and Contò study small and medium enterprises (SMEs) and their place in an increasingly complex and interconnected world. A way SMEs can operate in the face of that complexity can be the horizontal integration strategy through inter-firm organisational forms which allows firms to achieve better balanced relational dynamics with the trade and a closer connection with consumer. In order to reduce the risk of judgement mistake in decision-making process on this organisational and marketing strategy, they propose an inter-systemic consonance analysis among businesses, aimed at verifying the sharing level of common objectives. The model of supporting to decision-making proposed is the analysis of the strategic orientation homogeneity degree among a group of firms belonging to the same supply network.

Cave and Willis describe how systems thinking and SD have been used to support policy development and analysis for workforces in the English health and social care system. The authors describe an innovative framework developed by the English Centre for Workforce Intelligence (CfWI) to inform workforce policies. The framework takes into account the uncertainty associated with the future and is based on systems thinking principles and SD simulation. The framework integrates horizon scanning, scenario generation and workforce modelling and has been applied to numerous workforces across the sector. The paper also provides two case studies illustrating the application in support of policy analysis.

Finally, Tsaples and Armenia explore the effects of an increase in the retirement age to the viability of pension systems. They employ the methodology of SD to develop a model of the pension scheme in Greece and test a large array of scenarios that consider social unrest as an integral part of any attempt to pension reformation. The results demonstrated that an increase in the retirement age might not be the panacea for the sustainability of pension schemes.

Ultimately, we hope that this special issue will serve the purpose of demonstrating the high value of formal modelling and simulation methods in assessing and evaluating the impacts of policies and strategies both in the private and in the public sector, hence, promoting the use of the systems thinking and SD techniques for an innovative model-based governance approach.

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