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URBAN GOVERNANCE: A COMPLEXITY THEORY APPROACH

By Eve Mitleton-Kelly

Professor Eve Mitleton-Kelly is Director of the Complexity Research Group, and Senior Fellow at IDEAS (Centre for the study of International Affairs, Diplomacy and Strategy), London School of Economics and Political Science.

If urban governance is seen as a complex social system, then a different approach is necessary. This short paper will offer a few insights on such an approach.

Let us assume that *governance* includes the state, the private sector and civil society; and that it involves all levels of organisation from family units to entire societies and empowers and encourages people to take greater control (and responsibility) over their own (and their community's) development. And that *urban governance* includes the public and private transport networks, housing, public services (e.g. health, education), local government finance and central government investment.

Furthermore, let us assume that megacities, like London, are connected and interdependent with the economic space of the wider region (e.g. commuting into the city); influence the rest of the country; but also have an international dimension. Then megacities have regional, national and international interconnections and interdependencies and are part of a bigger whole.

From a complexity theory perspective then, cities have the following characteristics, and are *connected at multiple scales*; that is at local community, as well as at a regional, national, and international level. That connection is both internal within each level, but also between the different levels or scales. Because of that interconnection, *interdependencies* arise, which are again both internal and external. A local community may be affected by rules and regulations at city or national level but also by European Union Directives as well as by international law.

A city is dependent on efficient *feedback*, essential for running, for example, the transport network. Feedback is in turn dependent on accurate information, such as bus and train timetables, but also in the responses of passengers, pressure groups, etc.

A city is influenced by its *history*, yet it is essential to understand that history influences but does not necessarily determine the future. Complex systems have choices and can be very creative in the face of obstacles and are able to ***create new order***. The creation of new order or of new structures, ways of working or relating, is a characteristic unique to complex systems.

If the above characteristics apply, then cities are complex systems. In addition we need to look at three key concepts: (a) complicated and complex systems/problems; (b) design; and (c) co-evolution. Complicated systems are machine-type technical systems such as traffic lights. They have solutions, can be designed, and their behaviour can be predicted and controlled. On the other hand drivers, as individuals and collectively, form a complex social system and do not display any of the characteristics (a) to (c). Furthermore, if their behaviour needs to be changed, then a single and simple 'solution' may not be appropriate and they may need what is called an 'enabling environment' to facilitate the change. For example when seat belts were introduced, legislation alone would not have been enough. It needed peer support and changes in the cultural climate. It also needed the technical aspect of having belts installed easily and cheaply. Finally it needed time for the changes to be made and for drivers to accept what they perceived as a restriction of their freedom, which nevertheless could save their life. It took all of the above and many other influences to achieve the desired outcome of all drivers and eventually all passengers to wear a seat belt.

The traffic system, however, is a socio-technical system as it involves cars and traffic lights, which are technical and complicated systems as well as drivers, which are social and complex. The whole ensemble then becomes a complex sociotechnical system, which is interdependent.

In terms of design, a complicated technical system can be designed in the traditional sense, in that its behaviour can be predicted and controlled; but I would suggest that a complex social system like a city cannot be designed in the same way, except for certain elements, such as those which are purely technical and complicated. We therefore need to think about the 'design' of a city, as a complex system, in a different way to allow for *emergence*, *self-organisation*, *the*

exploration of the space of possibilities and coevolution. Let us explore each of these terms.

Emergence arises through interaction and is more than the sum of the parts. To understand this characteristic we need to distinguish between the process of a group interacting to address a problem together, exchanging ideas and insights, which are triggered as part of the process of exchange. The outcome of that interaction will be quite different to one where each individual is isolated in a separate room and asked to address the same problem. The insights cannot be added together to reach the same outcome achieved through the interaction of the group working together. Emergent properties are therefore systemic (the system working as a whole) and more than the sum of the parts. Because of that interaction, triggering new ideas, the outcome is also not predictable.

A complex social system like a city will generate new and unexpected properties and behaviours, which by definition cannot be predicted. It will also create 'new order' especially in the context of a crisis. To assume otherwise would be a grave error and yet many planners work on the assumption of predictability, as they are not aware of the distinction between complicated technical systems and complex social ones, and conflate the two.

Furthermore, humans are very good at self-organising. That is, at initiating tasks and activities, which are not directed by any outside authority. Take most community activities, they are voluntary and those involved decide *what* to do, *how* to do it and *when* to do it without anyone outside that group telling them or directing them in that task or activity. There are of course legal and other restrictions, which may constrain some of those activities, but that does not negate the ability of a self-organising group to initiate something that is new and creative within legal and other constraints. To ignore self-organisation is again a mistake, while encouraging it through the right conditions in the environment could be highly beneficial. Again the outcome is unpredictable, but the right enabling environment could well achieve the desired outcome, even if it might manifest itself in an unexpected guise.

Because of constraints, such as limited resources and legal requirements, such a group will explore alternative options and try to find new ways of doing things. Again creativity comes into play and the group will *explore its space of possibilities* until it finds a way that works and serves its purpose.

The decisions it makes and the actions it takes, in response to changes in its environment, is called 'adaptation'. When, however, those decisions and actions in turn influence the initiators of those changes (national government, local authorities, commercial companies, etc.) and they in turn change their behaviour, then that reciprocal influence that changes the behaviour of the interacting entities is called 'coevolution'. This is a very powerful dynamic, which again is not widely known, yet is active in cities (as in all complex social systems) much of the time.

Furthermore, coevolutionary dynamics apply at all scales and they will manifest themselves internally within the city (or borough) as well as externally with the region, the country and internationally. No city exists in isolation, but within multiple social ecosystems at different scales and at the same time.

In conclusion, the following insights are offered: (a) cities are complex social systems and we need to understand them as such and to work with their complex characteristics; (b) cities do have complicated elements, which can be designed and controlled, but which also interact with complex human systems; (c) complicated problems have solutions; while (d) complex problems need enabling environments. If city planners and designers were to take the above into account, they are far more likely to achieve beneficial objectives that are relevant and appropriate to cities as complex sociotechnical systems.

ENDNOTES

For the principles of complexity please see:

Mitleton-Kelly, E. 2003. 'Ten Principles of Complexity & Enabling Infrastructures', in by E. Mitleton-Kelly (Ed), *Complex Systems & Evolutionary Perspectives of Organisations: The Application of Complexity Theory to Organisations*. Pergamon: London, pp. 23-50.

For examples on the application of complexity and the EMK methodology please see:

Mitleton-Kelly, E. 2011. A complexity theory approach to sustainability: A longitudinal study in two London NHS hospitals. *The Learning Organization*, 18(1), 45-53.

Mitleton-Kelly, E. 2011. 'Identifying the multi-dimensional problem space and co-creating an enabling environment', in A. Tait and K.A. Richardson (Eds), *Moving Forward with Complexity: Proceedings of the 1st International Workshop on Complex Systems Thinking and Real World Applications*. Emergent Publications: Litchfield Park, AZ, pp. 21-46.