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**WHAT
URBAN WHY
MEDIA WHEN
ART WHERE
CAN & HOW
DO**

Editors

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Smart Complexity?*

BY HENRIETTE STEINER
& KRISTIN VEEL

In contemporary urban planning discourse, the concept of the *smart city* has been introduced as a strategic device. Its aim is to make use of self-reflexive information and communication technologies in large-scale infrastructural networks in order to analyse urban performance and make cities more competitive by allegedly allowing self-described “smart technologies” to make urban infrastructures more efficient. The discourse of the smart city can be seen as a contemporary attempt at articulating urban order in the face of the technological change of our present day. Smart city technologies also exemplify the increasing integration of self-reflective technologies and ubiquitous computing into urban everyday life. For smart city proponents, such technologies constitute a toolbox, which may be used to ease urban life to the benefit of us all. The aim is to create cities that are well structured, clean and free of vice. When replaced by *smart* ones, existing technologies on which contemporary urban infrastructures are based are represented as producing unnecessarily complex and inefficient conditions. As we have argued elsewhere, the smart city discourse can thus be seen as an attempt to provide a benign, ideal alternative to a perceived malign, inefficient, unsustainable and humanly disempowering complexity in the contemporary city.¹ Insofar as this is the case, the smart city discourse may be seen as embedded in a long history of modern visions of urban reform, each allegedly saving the city from itself.² The smart city discourse addresses the city as a whole interconnected system whose complexity can be reduced by technological advances and, in this way, enable citizens to live a more harmonious life together.

1. Henriette Steiner and Kristin Veel, Panos Pardalos and Stamatina Rasia, “For the Smarter Good of Cities? On the Smart City Discourse,” in *Cities for Smart Environmental and Energy Futures* (Vienna, New York: Springer, 2013), 291–303.

2. The modernists talked about the city they were trying to rescue as infected with tuberculosis. See for example: Le Corbusier, *Towards a New Architecture* (North Chelmsford: Courier Corporation, 1931), 277.

Looking at the way in which *complexity* is approached in the *smart city* discourse, it becomes clear that this way of talking about cities approaches urban order, like complexity, as something we can *get rid of* or *add*, and the aim of the smart city is to make the world more manageable without *adding* further complexity. However, in this essay we shall argue that talking about complexity as something that can be cleaned up like chewing gum on the pavement, does not deal with the issue at hand. Our starting point is that rather than to assume complexity as something that is possible to obliterate altogether, it is instead a figure of speech or metaphor of thought for talking about phenomena that express a particular form of order, which it is difficult for the individual to comprehend. Rather than being seen as simply *unorderly*, when a phenomenon or object such as a city is described as *complex*, its intrinsic structure and order is acknowledged and simultaneously held at bay conceptually. Insofar as we can talk about different *types* of complexity, as will be discussed in more detail later, these should be seen as corresponding to different epistemic paradigms, each of which have particular consequences for our way of understanding the world.

Paradoxically, the means for seeking to eliminate complexity in the smart city discourse are to embed additional technological layers in the urban fabric, using self-reflective technologies and ubiquitous computing to do so. However, we argue that these technologies provoke a particular way of thinking about complexity and, we contend that the smart city discourse can be regarded as silently enfolding an inherent paradox: by means of glossing over the particular form of complexity, which the so-called *smart* technologies in fact embody, it reduces significant dynamics of urban life and allows for a naïvely optimistic discourse reminiscent of other modern attempts to improve the city by rendering it as a (complex) system.

The aim of this contribution is to thus theorise the conceptualisation of complexity, as located in the smart city discourse.³ When

3. In the previous work from which this argument is taken, Steiner and Veel 2015, we expand this analysis by looking at the critical engagement with smart city technologies when put to use in a contemporary art context, a sculpture *Body 010000100110111011001000111001* (2012) by the British artist Stanza.

4. Jean Hillier, *Stretching beyond the Horizon: A Multiplanar Theory of Spatial Planning and Governance* (Hampshire: Ashgate Publishing, 2007).

used in cultural theoretic discourse, the notion of complexity reveals a long and complicated trajectory of shifting epistemic relations.⁴ As we outline below, the history of the use of the concept evinces slip-pages, which means that we need to take extra care whenever this concept is operationalised as is the case in the smart city discourse. The method of this contribution is to consider how the smart city discourse stands in relation to two paradigmatic, cultural theoretic conceptualisations of complexity: *Romantic* and

Baroque. These categories should be regarded as a necessary framework for approaching the intricate issue at hand, not as a consolidation of the dichotomy that they instigate. Our aim is to illustrate the need for a less dichotomised conceptual apparatus in order to begin to grasp what self-reflective technologies may mean for the way we understand the workings of the contemporary city, and the role of self-reflective information technologies and ubiquitous computing in it.

(Un)bearable Complexity: Romantic and Baroque

In *Complexities: Social Studies of Knowledge Practices*, science and technology scholar Chunglin Kwa introduces the distinction between *Romantic* and *Baroque* conceptions of complexity.⁵ It has since been taken up by a number of theorists such as John Law,⁶ Joris Van Wezemaal,⁷ Paul Cillier⁸ and Jean Hillier.⁹ This distinction allows us to take into account the degree to which speaking about complexity is embedded in historical and cultural paradigms, and how these influence our understanding of the matter at hand. The starting point for the present discussion is that the increasing omnipresence of self-reflective technologies and computing systems in our everyday lives means that they engender new experiences in a way that put pressure on our interpretive capabilities and challenge our conceptual vocabulary. As cultural theorists our task is, on the one hand, to develop a conceptual apparatus that allows adequate interpretations of these changes and the experiences they engender, and, on the other, to get to the bottom of discourses that try to operationalise such instances of cultural change for a specific purpose. The identification of Romantic and Baroque complexity paradigms is used here as a way of opening up this discussion.

According to Kwa, "Romantic complexity" refers to an epistemic paradigm that can be coupled to figures of thought that we know from nineteenth-century Romanticism. Romantic, in this sense, should be regarded as a particular outlook on the modern world, and Romantic complexity as a way of trying to grasp aspects of the modern condition through a particular conceptual apparatus. To describe a given set of phenomena as complex, in this sense, may thus be seen as a way of coping with and understanding the changing realities of the modern

5. Chunglin Kwa, "Romantic and Baroque Conceptions of Complex Wholes in the Sciences," in *Complexities: Social Studies of Knowledge Practices* (Durham: Duke University Press, 2002).

6. John Law, "And if the Global Were Small and Non-Coherent? Method, Complexity and the Baroque," December 7, 2004. <http://www.heterogeneities.net/publications/Law2004GlobalBaroque.pdf>

7. Joris Van Wezemaal, "Housing Studies between Romantic and Baroque Complexity," *Housing, Theory and Society* 26 (2009): 81-121.

8. Paul Cilliers, *Complexity and Post-modernism: Understanding Complex Systems* (London: Routledge, 1988).

9. Jean Hillier, *Stretching beyond the Horizon: A Multiplanar Theory of Spatial Planning and Governance* (Farnham: Ashgate Publishing, 2007).

world. Romantic complexity is characterised by the aim of describing complex and seemingly chaotic phenomena by uniting heterogeneous items into a functional whole. The emphasis is on fixed and natural laws. Being can be identified and described. As Joris Van Wezemael writes:

The romantic metaphor implies the aim of grasping the “whole” as an emergent entity. It treats complexity as a phenomenon which is coupled to emergence. Although it displays a complexity of interior relations it can be held as one whole. Its component parts are constituted by the very relations they have to other parts in the whole.¹⁰

10. Joris Van Wezemael, “Housing Studies between Romantic and Baroque Complexity,” 81–121.

The individual parts stand in a causal relation to one another and are hierarchically ordered by the whole of which they are part. Society is

regarded as an organism, which is made available for the human mind through strategies of homogenisation and abstraction, but also an irreducibility which follows its emergent properties. This is the centralised and controlled perspective of the planner, and this inclination to attempt to get an overview is an approach, which we also know as a response to the encounter with the modern metropolis of the nineteenth century and the notorious sensory overload this encounter may provoke.¹¹ According to Paul Cilliers, this is a mathematical and computational view which can also be

11. See for instance Georg Simmel on the sensuous sensory stimulation provided by life in the modern metropolis in Georg Simmel, “The Metropolis and Mental Life,” in *On Individuality and Social Forms*, ed. Donald Levine (Chicago: Chicago University Press, 1971), 324–339.

12. Paul Cilliers, *Complexity and Post-modernism: Understanding Complex Systems* (London: Routledge, 1988).

13. Jean Hillier, *Stretching beyond the Horizon: A Multiplanar Theory of Spatial Planning and Governance* (Hampshire: Ashgate Publishing, 2007), 44–45.

14. Joris Van Wezemael, “Housing Studies between Romantic and Baroque Complexity,” in *Housing, Theory and Society* 26 (2009).

associated with more contemporary theories such as cybernetics and chaos theory, which both aim to get an overview by *looking up*, i.e. zooming out and abstracting until a whole can be identified.¹² In a discourse based on romantic complexity, there is a presumed fixed set of natural laws by which entities can be known and the patterns of a system can be modelled and predicted as emergent structures.¹³

If we now return to the question of complexity, technology and the contemporary city with which we began, the rhetoric of the smart city purports to seek to reduce complexity – thus placing it in dialogue with age-old conceptualisations of urban planning.¹⁴ This sense of complexity as a negative fact of the unordered city stands in contrast to notions of the city as a complex system but at the same time a smooth machine, one that is efficient and well organised through

the insertion of particular forms of technologies. So what we are dealing with is in fact not a reduction of complexity (understood

in its simplistic form as tending towards disorder), but a replacement of an argument around complexity as disorder with a different kind of understanding of complexity (which we here call Romantic). It is one that is based on the idea of the city as an infrastructural system that can be controlled and thus reshaped for the better, and it fantasises the city as a closed container of which we can get an overview in the panoptic sense. It thus regards the city as an emergent, complex, (implicitly global) whole that can and should be managed.

Identifying the smart city discourse as purporting a romantic notion of complexity points to a particular way of thinking about cities (as chaotic and disjointed) and a perception of technology as a tool that can be used to make cities and the world better and more whole. However, as already argued, the embedding of ubiquitous computing technologies in the urban lifeworld does not as such result in a well-ordered and systematised urbanity that can be viewed from above. Rather than following this line of interpretation, we may focus on the fact that the integration of these technologies into everyday life generates new forms of experiences. This means that we need to consider how we may describe and understand the city in the face of these technological changes.

In opposition to romantic complexity, Kwa positions what he terms *Baroque complexity*, and which, as a conceptual paradigm, Hillier aligns with poststructuralism. Significantly, Law conceptualises the baroque notion of complexity, following Deleuze's work on Leibniz. In this context, *Baroque* should thus be understood as a poststructuralist reading of the historical period of the baroque.¹⁵ In such an interpretation of the world we have no distinction between individuals and their environments.¹⁶ The God's eye view has been replaced by the aim of managing flows. "Although there may well be some higher order level (such as a city), it is impossible to describe and explain it fully from a Baroque viewpoint".¹⁷ We have thus moved from Foucault's disciplined society to Deleuze's society of control. As an epistemic strategy, baroque complexity is geared towards the specific and the concrete, where it discovers (material) heterogeneity.¹⁸ Individuals act in multiple networks and patterns are rarely repeated. There are no natural pre-given boundaries, yet connections are impossible to deconstruct. Van Wezemael writes that "[as] the baroque discovers complexity in specificity, rather than in the emergence of higher-level

15. John Law, "And if the Global Were Small and Non-Coherent? Method, Complexity and the Baroque," December 7, 2004, <http://www.heterogeneities.net/publications/Law2004GlobalBaroque.pdf>; and John Law, "Assembling the Baroque," CRESC, Open University, December, 2011. <http://www.cresc.ac.uk/medialibrary/workingpapers/wp109.pdf>

16. Jean Hillier, *Stretching beyond the Horizon: A Multiplanar Theory of Spatial Planning and Governance* 46

17. *Ibid.*, 45.

18. Joris Van Wezemael, "Housing Studies between Romantic and Baroque Complexity,"

order, we do not move off into the abstraction of an interrelated and emergent whole as the romantic approach does".¹⁹ For Hillier,

19. *Ibid.*, 88.

20. Jean Hillier. *Stretching beyond the Horizon: A Multiplanar Theory of Spatial Planning and Governance*.

Actor–Network Theory represents a form of Baroque complexity thinking.²⁰

If the Romantic notion of complexity could be seen as a typical epistemic response to the experience of sensory bombardment that the modern metropolis engenders, the baroque notion is born out of the experience of a digitised network society. They both represent a response to a not dissimilar sensation of overload and therefore also attest to our contemporary incapacity to conceptualise environmental order. To think in flows, invisible but strong connections impossible to view from above, but where meaning resides in these relational points or where changes at one node in a network may inflict changes at other points of the network, seems a convincing way of conceiving of the world in a situation where our lifeworlds have been ubiquitously pervaded by network technologies – be it structures such as the World Wide Web or the integration of technology in everyday life situations. The vocabulary of Baroque complexity thus allows us to identify and describe characteristics of life in a smart city that are not possible to articulate when operating with only a Romantic notion of complexity.

Interestingly, the romantic notion of complexity when proposed at the discursive level seems to deflect our attention away from the consequences of the inherent complexity of form of the technologies in question. Understanding this form of complexity as Baroque has the advantage that it begins to grasp both the potential for a more distributed form of relating to the systematic aspects of urban life and the new regimes of control and micro-management that reach deeply, subtly and often unnoticeably into our everyday lives. Approaching complexity in the contemporary city as a Baroque complexity may therefore show us something about the consequences of the presence of self-reflective technologies and ubiquitous computing in our everyday life.

As presented here, the Romantic conception retains a somewhat nostalgic character, whereas the Baroque sounds more progressive. However, this lop-sided interpretation of the concepts is not quite fair when seen in a more general perspective. What is striking is the way in which both notions of complexity apply to a contemporary discourse concerning the integration of *smart* technologies into everyday urban life. However simplistic and dichotomised the two categories of Romantic vs. Baroque might seem, in conjunction they provide us with an interpretative framework that allows us to come closer to an understanding of the

experience that self-reflective technologies and ubiquitous computing engender, and which we believe is embedded in the crossroads between these two conceptions of complexity.

The Romantic and the Baroque can be regarded as different types of responses to the same overload challenge, which each have their limitations, and only perhaps in combination can they begin to help us interpret what is at stake when the city becomes infused with self-reflective technologies and ubiquitous computing and what forms of *experience* this engenders. We thus contend that in its ability to provide us with adequate hermeneutic abilities for understanding the world around us in the face of the technological change of our present, our conceptual apparatus indeed remains underdeveloped. Yet, we cannot simply argue for a leaving behind of the Romantic and an embracing of the Baroque when trying to understand the complexity before us. Both are too limited by their respective suggestions of providing a worldview. However, we suggest a mediation of the two that uses them through transaction in praxis and thereby explores the two terms as interpretive devices, at the same time suggesting the possibility of their potential transgression. If we are to take the new choreographies of the relationship between individual and city that Smart City technologies in fact both promise and buy into, we need to look for instances of *embeddedness* of one within the other, facilitated by technology, where the qualities of the clear demarcating contours and irreducibility of individual experience (which the Romantic notion of complexity seeks) and the boundless and unruly flows of the network society (which the Baroque notion of complexity aims to capture) come together. This would be a complexity that lets that deep background of the urban order materialise through the texture of the writing, the representation, and only thus, rather than residing in preconceived categories and concepts.

* This text is an adapted excerpt of Henriette Steiner and Kristin Veel, "A Portrait of the Artist as a Smart City. Body, Complexity and Urban Life," in *Ubiquitous Computing, Complexity and Culture*, eds. Ulrik Ekman, J. David Bolter, Lily Diaz, Morten Søndergaard and Maria Engberg (London, New York: Routledge, 2015), 195–205.