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Endemann, Henry, Buehring, Joern and Bruyns, Gerhard

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Complex Urban Futures—Using scenarios to tackle the complexity of megaregional systems

Henry Endemann, Joern Buehring, and Gerhard Bruyns

School of Design, The Hong Kong Polytechnic University

Megaregions represent the massive scale and overwhelming complexity of contemporary urbanisation. This requires new and adapted methods for those designing in and for megaregions. Scenarios are a promising tool for this, but urban designers struggle to use them systematically. Improved and adapted scenario-building methodologies for urban designers are needed. Therefore, this presentation puts forward a framework to reveal and discuss urban complexity through megaregional scenarios. The framework is constituted by three phases: analysis, design, and evaluation, in which the analysis builds the basis for an iterative process of drafting and assessing scenarios. The focus of this presentation is the design phase, which is most relevant for the implementation of systemic design principles. The presentation emphasises the importance of including multiple stakeholders in a design process that triangulates different design methods. It shows tests of the framework in design studios at different universities, in which students translate abstract themes into concrete spatial concepts during playful, intuitive, and fast-paced design sessions. The exploration of various design options across various performance indicators helps to initiate discussions on the complexity and ambiguity of megaregions. While further fine-tuning of the framework is needed, it shows the potential to ultimately support well-informed decision-making in the context of megaregionalisation.

KEYWORDS: complex urban systems, megaregions, scenarios, regional design

RSD TOPIC: Architecture & Planning, Methods & Methodology

Presentation description

Problematization: better methods for designing megaregions

Urbanisation is becoming faster, more extensive, and more complex. A prominent representation of this development is the emergence of megaregions—massive and ever-expanding polycentric urban fields encompassing networks of powerful urban centres and their surroundings. As urban units with increasing importance (Florida et al., 2008), megaregions express several contemporary urbanisation processes such as agglomeration, peri-urbanization, monopolisation, and globalisation. As these processes shape megaregions, megaregions shape the world's economy and the planet's ecology (cf. Harrison & Hoyler, 2015). Hence, the future of megaregions and their complex entanglement with global systems has major implications across society.

While megaregions have been acknowledged as a phenomenon for decades (e.g., Gottmann, 1957; Mumford, 1938), their active transformation has only been addressed more recently. Its massive size alone makes “designing the megaregion” (Barnett, 2020) a daunting task. New and adapted methods may help to approach this challenge. The method that will be explored here is scenario-building.

Scenario-building aims to create representations of plausible futures (Goodspeed, 2020). Following this very open definition, scenarios are used in various fields and for various issues - widely considered useful to deal with uncertainty, unravel complexity, and ultimately guide decision-making (cf. Amer et al., 2013; Chermack et al., 2001; Stewart et al., 2013). Due to their widespread use, it is hardly feasible to question the use of scenarios in general. Instead, it seems more practical to test and improve scenario-building in specific disciplines. Therefore, this presentation focuses on urbanism and business management. Urbanism is often considered to struggle with the systematic application of scenario-building methodologies (Avin & Goodspeed, 2020;

Chakraborty & McMillan, 2015; Stojanovic et al., 2014). Conversely, business management offers a wealth of theories and best-practice in building scenarios. However, it largely deals with corporate environments and the perspective of singular private actors, while urban development is typically characterised by more diverse environments that include private and public actors. Megaregions further exacerbate this. Moreover, scenario-building is frequently criticised for having “dismal methodologies” (Spaniol & Rowland, 2018). Nonetheless, the extensive use of scenarios in business management poses the question of what urbanism can learn from it when it comes to designing megaregions. How do scenario-building methodologies have to be adapted to megaregional complexities? This presentation gives first insights into a respective framework.

Testing a framework for megaregional scenarios

Given the challenges of designing megaregions and the related potentials of scenarios outlined above, this presentation puts forward an initial framework for building *megaregional scenarios*. Thereby, it explores if and how scenarios can help to reveal and discuss the complexity of urban-regional design in the context of megaregionalisation.

Creative problem-solving processes typically follow a three-stage process that includes different forms of analysis, idea generation, and evaluation (e.g., Brown & Katz, 2011; Meyer & Norman, 2020; Steinitz, 2012). A synthesis by Foster (2016) shows that an iterative use of this structure is proposed in some of the most popular design frameworks. Accordingly, the framework presented here has three parts: analysis, design, and evaluation. While the analysis phase builds a spatial inventory of the given megaregion, the evaluation and design phase constitutes an iterative process of drafting scenarios and testing their performance. Beyond this rather conventional outline, the key novelty of the framework is its adaption to the context of mega-regionalization, specifically in terms of stakeholder environments and spatial patterns. Accordingly, the focus of this presentation is on the design phase, which is the key phase for implementing systemic design principles.

The design phase builds scenarios on the basis of two main inputs: design studios and expert consultations. In the design studios, participants (bachelor and master students

with prior experience in spatial design) translate abstract normative concepts such as “health”, “creativity”, or “inclusion” into concrete spatial patterns. This is done through fast, intuitive, and hands-on design sessions. The collected data includes 38 projects developed by approximately 200 students.

Following the wealth of ideas that emerged from the design studios, the second part of the design phase consults experts. The aim is to perform a reality check on the initial designs. Conversations can take different shapes, from short interviews to more extensive focus groups. Approached experts are stakeholders that are familiar with urban development processes in the given megaregion. This means that instead of approaching a complete set of actors involved in mega-regionalization, the focus lies on those that actively shape design and planning in this context, which mainly includes design and engineering consultants, developers, and planning departments. While this is a limited set of stakeholders, they are expected to also generate relevant insights on their experiences in working with a broader set of actors, such as other private organisations, politicians, or civil society.

Finally, the outcomes of the design phase are synthesised into a concise set of scenarios. This is where knowledge from strategic foresight is helpful in determining the appropriate number of scenarios, time frames, and uncertainties to be considered. The scenarios are then taken for an extensive round of assessment along with a comprehensive set of sustainability indicators.

In short, the framework presented here uses various inputs to model design options and then tracks the change these design options may cause across various factors. Driven by the complexity of megaregions, the framework thereby caters to some of the key challenges addressed by systemic design—complexity and ambiguity (cf. Ryan, 2014). Thereby, different actors are included in a design process that does not aim to create one perfect solution but rather embraces alternative pathways as a basis for informed discussion.

The presentation demonstrates the interrelation of the different parts of the framework and shows initial outcomes for the inputs used in the design phase, namely design studios that were conducted at different universities between 2018 and 2022, as

well as the first round of expert conversations. It thereby gives some concrete examples for the use of the framework while emphasizing that it is in progress and in need of further fine-tuning.

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