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Systemic Diagramming: an approach to decoding urban ecologies

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In the context of architectural education, the terms sustainability and ecology are often used as synonyms for 'environmental friendliness' and 'greenery/nature' respectively. Various versions of 'Environmental Design' in the form of active and passive building technologies are enthusiastically and collectively encouraged into the design of most student projects, commonly resulting in the sudden and inexplicable overnight additions of windmills and solar panels to what may have been, for instance, an ambient exploration of a multi-faith based worship space. The clever tend to prefer the invisible technologies, and manage to convince in technical reports with colourful diagrams of ground source heat pumps beneath their carefully guarded spatial sections.

The 'how' seems to have become the final bastion of architecture, with the 'why' hardly ever being questioned and the 'what' relegated to fashionable or aesthetic one-liners that need not attempt to engage with contemporary social issues. Especially not when situated within potentially risky areas such as human ecologies, which may raise questions about how people live – how we influence ways of living – and how this relates to the environment. While architecture professes to acknowledge and engage with issues of long-term sustainability, the education of the architect often continues to be a reinforcement of myopic views, marked by a fear of comprehending issues outside the red line of the building site or the master plan. The primary limitation of current common practice in architectural education, it seems, is the inability to seriously understand architectural interventions as part of several larger and (often) dynamic systems.

It is in this context that as Year 3 Unit 1 Leaders at the University of Nottingham we have made an attempt to integrate thinking about systems and, especially, 'systemic diagramming' into studio design methods. We are hoping to provide students with tools to start thinking about physical urban transformation, socio-economic fault lines and underlying power relationships, in close consideration with resource flows and environmental concerns. This is while acknowledging, of course, that the definition of a 'system' and its limitations is both a subjective practicality and a reflection of the scope of consideration allowed to oneself. Systems thinking allows for new perspectives on (sometimes) familiar phenomena and for engagement with seemingly unrelated issues at various scales – from the micro to the macro – situated within existing and emerging structures. This approach requires the comprehension of the parts of a defined system and, more importantly, of the different relationships between these parts. Borrowed from the natural sciences, systemic diagramming supports the attempt to map and communicate actors, resources and flows that are part of the whole and related to each other with overlaps and exchanges. In the

context of the design studio, systemic diagramming was explored as an instrument to map relationships embedded within the urban environment – and as a tool to test the possible consequences of proposed interventions for existing and possible future conditions.

The design studio project referred to here was an invitation – a call to arms – for the architects of the future generation to take on responsibility for the consequences of their architectural practice as complicit in the production and reproduction of potentially wasteful and unsustainable patterns of being in the world. The studio was undertaken in Year 3, Unit 1 at the University of Nottingham and based on a field trip to Prato in Tuscany, Northern Italy. Prato is a city marked by socio-spatial conflict caused by the sharp decline of its historic textile industries and the simultaneous documented and undocumented immigration from mainland China. The newly elected right wing exploited the situation to displace the previous left leaning government after more than 40 years. Emerging networks of manufacture and supply, the increasingly scarce availability of cheap labour and housing, and new laws aimed at controlling the impact of a visible Chinese population on a medieval Italian city all contributed to the character of this highly charged and transforming spatial configuration. The territories located in the adjacent but distinct areas of the historic city centre and 'China town' to the North West, separated spatially by a medieval city wall, marked the evident areas of contestation.

Before arriving in Prato, each student engaged in remote research about the city and developed his or her own imaginative approach, including the mapping of the contents of refrigerators in private homes in an effort to understand the distribution of wealth, the scarcity of space as well as ethnic and individual preferences in selected areas. The simplified cartography served as a method of abstraction and set the ground for the development of individual briefs for personally identified sites.

Throughout the process, the developing architectural object was interrogated as part of a wider urban topography in which changes were comprehended as sometimes immediate and visible and sometimes hidden and gradual. It was here that the systemic diagram became crucial: students situated their proposed interventions within a previously elaborate (if partial) systemic diagram of existing conditions. This included but was not limited to ecologies of production, processes of post-industrialisation and environments promoting inclusion and examined the potential impact of their interventions by developing post-intervention scenarios.

In an effort to free up analytical and representative processes, no specific pictorial or representative styles were encouraged. Instead, exercises centred on the potential value of the extrapolation of different types of found or recognised patterns to help define systems of visible and invisible relationships and possible causal flows. While most studies initially started by default with a distinction between recognisable 'soft systems' (those that deal with subjective perceptions and unquantifiable social resources) and 'hard systems' (such as those of which clearly quantifiable material resources are part), the introduction of timelines and the resultant complexity and ability to think of the systemic diagram as a projective tool allowed several of the projects to engage with more open ended 'evolutionary systems'. Projects were thus developed with an awareness of the wider impacts on larger ecological systems and

the systemic diagram became a tool to test both the 'why' and the 'what' of the spatial intervention.

Some of the difficulties we encountered while working with students on systemic diagramming included, for instance, the definition of limits: on the one hand, of course, everything relates to everything else. On the other, a strict definition of a system based on recognisable relationships can be overly reductive (like separating water, vegetation and topography in a geographic map and thus losing the essential relationships between them). Eventually, the limits of a system may be thought of in terms of scale, and spatial scale proved to be a useful self regulation in an architectural design studio, without limiting an understanding of geographically smaller systems being situated within the larger context of a given site. The approach taken succeeded in destabilising the consolidated views held by a majority of students that architecture and design are but the material objects resulting from ingenious conceptual ideas rooted in the metaphorical exploration of some poem, painting or natural phenomenon – to name just a few. Systemic diagramming helped students to identify their own position in terms of political, socio-economic and environmental considerations and to take on, or at least comprehend, the responsibility for the multifaceted consequences of their proposed interventions.