



Preemptive Futures: A Study of A Circular Information Economy of Architecture

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Preemption is an action conditioned by speculations on proximate futures based on past data. Preemption has been widely studied in economics to deduce models of strategic interactions between actors, who make decisions based on the feedback of information, where information is value that is represented, quantifiable, and tradable within the economy. In today's urbanism, the digitisation of data helps to accelerate the feedback process of preemption and individuates information. For instance, Sidewalk Lab uses hyper-personalisation to preempt the supply and demand of energy at the scale of individual citizens. Nonetheless, the flow of information in the field of architecture remains linear and impeded. This limits the re-distribution of resources within its economic structure, resulting in a small clique economy as opposed to a circular economy. In the face of climate change, this research that aims at defining an applicable framework of preemption for architecture and urban planning.

1. Purpose of the Research and its Importance to the Field

The 2050 target is a universal anthropogenic timetable, which commenced many transnational initiatives against the climate emergency. The C40 is a notable example that serves as a platform of communication between 94 megacities around the world to establish a global data registry (Rimmer 2008). Digital data is useful in modelling predictive analytics to speculate on possible futures, which will assist in defining the discourse of behavioural changes and guide our everyday urban routine. This gives value to information derived from data to become tradable assets in our economy. The current information market is populated by private digital platforms, which are radically reconfiguring the public realm using hyper-personalisation techniques as preemptive strategies. For instance, the Sidewalk Labs instrumentalises public spaces to gather user data that feeds predictive algorithms to personalise energy plans in real-time and preempts overconsumption (Sidewalk Labs 2020). In this case, preemption is being used to optimise the distribution of resources, but contributes to the monetisation of the public realm and creates spaces of political tension (e.g. social surveillance).

Preemptive strategies may assist architects and planners to plan against climate change by designing self-organising and resilient urban systems (Avanessian & Malik 2016). The development of information economies is demanded to support preemption in complex systems; nonetheless, it is heavily conditioned by the accumulation and extraction of data within a network of actors (Bottazzi 2018). Along these lines, it is important to have a holistic understanding of preemption: its historical and scientific foundation, its current applications in urbanism, and how it can be coupled with digital technologies to be utilised across various ground conditions.

2. Brief Survey of Background and the Proposed Approach

The research reported here combines literature study and case study methods to map a timeline of events, from the mid-20th century till now. The research aims at defining an applicable framework of preemption to establish a circular information economy for architecture and urban planning in the face of climate change.

The literature study section focuses on tracing Cybernetics and its subsequent disciplines, in particular *Wiener's Cybernetics*, *Second Order Cybernetics (SOC)*, *Game Theory*, and *Actor Network Theory (ANT)*, to establish a historical and scientific foundation of preemption. Through this mapping, the study delineates how preemption had been democratised from a military art, to a corporate financial tool, and eventually to a civil art. This section aims to explain how Cybernetics remains an important influence to preemption via the development of information economics and hyper-personalisation techniques.

The case study section focuses on contemporary urban landscapes, and consists of three cases: algorithmic personalisation in digital platforms, the democratisation of Blockchain in geopolitics, and the use of Big Data in the Coronavirus pandemic. Although these cases are seemingly different in nature, they operate on similar Cybernetics principles, and well exemplify how preemption is being exercised on various ground conditions. In the face of climate change, this section aims at discussing what are the kind of preemptions we should anticipate in architecture and urban planning to establish a circular information economy.

3. Expected Contributions and Progress Towards Goal

This research examines the idea of preemption by comparing its historical base and implications in various contexts. It will organise and tabulate a timeline of precedents on the development and the use of preemption. It aims to develop a vocabulary base on preemption that can be used as the foundation of a communication device that navigates across east and west, and help sets a common ground for mediating risks collectively. This research aims to help us in questioning what are the kind of preemption we want in different contexts, and diversify our means to preempt futures.

This research first traces back to WWII, where preemption was used as a military art to defend against aircraft fire (Venter 2013), and became the origin of Norbert Wiener's Control Theory—Cybernetics (Wiener 1961). Then, this research talks about how Cybernetics was democratised from a military art to a civil art after the end of WWII, and transfigured into Second Order Cybernetics in the 70s (Scott, 2004), which focuses on observing complex dynamics like social systems (Pask & Foerster 1961). Second Order Cybernetics emphasised on feedback and self-organisation made advances on artificial neural networks (McCarthy, Minsky, Rochester, Shannon, 1955), pattern recognition and predictive analysis, which are useful tools in preemption. In the 80s, Cybernetics became heavily influenced by and influenced many interdisciplinary fields, including Game Theory (von Neumann & Morgenstern 1947), which piloted the development of information economies and digital technologies. This accelerated the use of preemption, which heavily relies on transacting and processing information for decision-making (Nash 2002). The beginning of the 21st century saw the rise of the platform economy, which can be analysed using the Actor Network Theory (Latour, 2005). This turns data mapping and predictive analysis from causational to correlational using digital technologies (Carpo 2017). This methodology is widely adopted by digital platforms to preempt supply and demand correlation, which enables personalisation for users.

In the first case study, algorithmic personalisation (Milovanović & Popović 2019) is being used to examine if the current model is the kind of preemption we need in the face of climate change. The second case study

used blockchain (Nakamoto 2008) as an example to review how preemption is not a rigid framework, but has the potential to fit various ground conditions and achieve different effects. The last case delineates potential limitations and cultural ethics of preemption using the Coronavirus pandemic and the use of Big Data as an example (Takeuchi 2020).

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