Improstructure - an improvisational perspective on smart infrastructure governance

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ABSTRACT

Infrastructure modernization is a central concern in many cities of the developing world. Local governments struggle to provide adequate public services under budgetary constraints and vast spatial and economic inequalities. After the demise of the centralized modernist planning paradigm, current approaches to urban development focus on public-private partnerships, resulting in networks of dependency that involve multiple stakeholders and complex relationships of accountability. This stakeholder complexity complicates decision making, but can also lead to new social practices and participatory models of infrastructure governance.

This paper presents the results of a qualitative study of social practices surrounding the provision and modernization of streetlight and electricity in Paco, Manila, enacted by formal and informal actors. Drawing from the case study, literature on organizational improvisation and improvisational governance (Martijn Hartog, 2015), we propose a model of infrastructure governance that is based on the concept of improvisation. Based on ethnographic fieldwork and interviews with city officials, planners, residents and local activists, we develop the notion of improstructure as a conceptual model for understanding infrastructure governance as an improvisational process of “call and response” among a diverse set of actors.

We apply this perspective to ongoing modernization efforts by the city of Manila and its utility companies, involving smart city technologies including sensor networks, drone mapping, and data analytics. We argue that despite the placeless and generic rhetoric surrounding these technologies, they constitute improvisational responses to local conditions. We conclude by formulating design principles for improvisational infrastructure governance, which are not limited to the Global South, but also apply in developed countries.

1. Introduction

Among other peculiarities, a visitor to Manila might notice a perplexing variety of street lamps in sculptural shapes, bright colors, and gaudy designs. While infrastructure is often treated as neutral, standardized, and invisible, the streetlights in Manila are flamboyant, multifaceted, and come in various states of maintenance and repair. In the centrally located Paco district—the site of the subsequent investigation—almost every street uses a different type of luminaire. The variety of designs corresponds to an equally wide range of uses and conditions. Some lamps are well-maintained, some broken, and yet others show signs of ad hoc repairs, such as wires pulled out from the lamp post and routed to a makeshift luminaire close by. Lamp posts are also appropriated in different ways, supporting makeshift structures or holding street decoration and clotheslines. Where light is needed but not available, it is provided by local actors such as residents or street-vendors equipped with batteries or jumper cables.

Local newspapers attribute the astonishing variety in street lamp designs to corruption, alleging that the extravagant streetlights were bought at inflated prices together with lucrative maintenance contracts (Marketman, 2007). City officials emphasize that the iconic lamps attract foreign tourists and investments. However, both explanations fall short in capturing the complex realities and social practices surrounding nighttime illumination in Manila, which involves a multitude of formal and informal actors. The sculptural “lollipop lamps” first appeared in Manila during Mayor Lito Atienza’s tenure (1998–2007). The project was close to the mayor’s heart; according to a city official, the mayor picked the models from the supplier’s brochures himself. Subsequent administrations were less enthusiastic; the current mayor, Joseph Estrada described them as an embarrassment and launched an initiative to replace them with a standardized design in 2015 (Sauler, 2013).
The lollipop lamp as a material artifact offers a window into a complex system of infrastructure governance. Urban infrastructure and service provision have traditionally been associated with long-term planning and extensive capital resources controlled by central authorities. However, during the past decades of infrastructure privatization, this modernist paradigm has shifted into a networked mode of system building that involves many public and private stakeholders (Steve Graham & Marvin, 2001; Thomas P. Hughes, 1998). In this model, the networked distribution of power, resources, and accountability involves constant coordination and re-negotiation of relationships between the actors involved. These conditions can also be observed in the system of street light and electricity provision in Manila, where international organizations, national and municipal governments, utilities, local interest groups and a large informal sector shape the distribution of electricity and provision of street lights.

Based on a case study of the social practices surrounding street light provision in central Manila, this paper conceptualizes this mode of distributed governance as a process of improvisation. The actors involved in this process respond to the results of each other’s actions based on the resources available to them, similar to jazz musicians drawing from their individual repertoires. Beyond offering a lens for describing existing conditions, we argue that principles of improvisational governance are also relevant for understanding future technological changes to the system. As the city of Manila embarks on a project to upgrade its street lights to LED technology and the power distribution utility Meralco launches a smart city initiative that involves drone-mapping the grid and installing smart meters in low-income neighborhoods, we argue that these modernization measures are again part of an improvisational process rooted in local conditions. Despite the globally interchangeable rhetoric surrounding these technologies, they are deployed as responses to specific local conditions and practices of appropriation.

We use the term “improstructure” to describe a mode of fluid, participatory infrastructure governance, where decisions are implemented immediately, but are at the same time historically contextualized in an environment structured by social conditions and power relationships. Drawing from literature on organizational improvisation (Cunha, da Cunha, & Kamoche, 1999; Hadida, Tarvainen, & Rose, 2015) we consider informality and improvisation not outside, but instead often located inside formal systems of governance.

Practices of improvisational infrastructure governance share similarities with co-production models of public services (Boavird, 2007; Joshi & Moore, 2004; Marvin & Guy, 1997; Ostrom, 1996). In both frameworks, collaborative approaches to service provision with an emphasis on individual agency are employed within an institutional environment. But there are important differences. In improvisational frameworks, collaboration can emerge in an unplanned and unmediated way. Furthermore, the interests of the actors involved are not necessarily aligned; they can be competitive or even adversarial.

The improvisational governance of infrastructure is tightly connected to its material and aesthetic dimensions, as the street lights of Manila illustrate. Policies are often driven by the aesthetic experience of infrastructure; “how things look.” Infrastructure is not merely a silent enabler, it is also a communication system that signals how systems are managed, represents powerful actors, and delivers promises of possible urban futures.

2. Manila’s electric infrastructure in historical context

During the past half-century, Manila has experienced extraordinary growth (Fig. 1). Almost completely destroyed during the Second World War, the city is today one of Asia’s most populous places. The municipality of Manila, occupying only a small part of the metropolitan region, also known as Metro Manila or the National Capital Region (NCR), has an average density of over 66,000 persons per square kilometer, which makes it one of the densest cities in the world (United Nations, 2015). Manila’s ascent to a global city has led to both climbing land values and a shelter crisis: over a third of Metro Manila’s population lives in informal settlements (Ragragio, 2003; Shatkin, 2004). The definition of informal settlement is somewhat blurry, mixing different criteria for low-quality housing, legality of land titles, income factors and including subjective assessments on a case by case basis. Public agencies distinguish between informal settlers, who may lack land titles but are tolerated, and professional squatters, who are not tolerated. (Ragragio, 2003; Shatkin, 2004).

The rapid urbanization took place despite of comprehensive urban planning efforts. During the past decades, planning authorities sought the solution in western paradigms of modernization and privatization, encouraged by policy advice and loan requirements of international lenders including the World Bank and the Asian Development Bank (The World Bank, 1993). As these models largely failed, the city kept struggling to provide basic public services such as transportation, electricity, and sanitation (Shatkin, 2008). Manila’s residents experience frequent power blackouts and brownouts, flooding, and suffer from air pollution caused by ubiquitous and permanent traffic gridlock. In this environment, policymakers are often forced to improvise to address the most pressing problems. Limited budgets and small municipal workforces require an agile, ad-hoc-style of planning. The planners of a large-scale urban redevelopment project described their experience of working in a space where technical, institutional, and organizational responsibilities are insufficiently defined, while more and more stakeholders kept coming to the table.

One manifestation of Metro Manila’s growing pains is the development of its electric grid. During the 1990s, the country experienced a severe power crisis characterized by daily power disruptions and a lack of access to electricity for significant parts of the population. In response to these conditions, the Electricity Power Industry Reform Act (EPIRA) from 2001 introduced sweeping privatization and deregulation of the electric grid, modeled after similar efforts in the UK and Australia (Sahakian, 2014, p. 50). These reforms, however, failed to resolve the technical and social issues. Today the region’s residential electricity tariffs are among the highest in the world — in Asia surpassed only by Japan and Australia and on par with New York (Lantau Group, 2013). Moreover, the tariff structure is complex and opaque, reflecting the entangled relationship between the regulatory commission, the distribution utility, and the local government (Mouton, 2014).

The mutual dependencies of different actors and the absence of clear leadership are the context in which improvisational governance unfolds. Since electricity tariffs are set but not subsidized by the government, the distribution utility passes on all costs to its subscribers, including mandated subsidies for low-income households as well as system loss due to inefficient infrastructure and electricity theft (Sahakian, 2014, p. 68). As a distribution utility, Meralco cannot generate its own power or directly set tariffs; the company therefore has to seek creative ways to minimize costs towards its customers and interpret and influence policies towards the regulatory commission. The government, in return, has chosen to take a weaker role in energy policy and empowered private actors. The barangays, the smallest administrative units in the Philippines with sizes ranging from a neighborhood to a medium municipality, have no formal role in electricity governance, yet remain present in all of its practical aspects (Mouton, 2014, p. 14).

3. Infrastructure and improvisation - a theoretical framework

Urban infrastructure is frequently described in dichotomies such as public and private, provider and user, top-down and bottom-up. Within the planning discipline, most accounts describe urban infrastructure services from the angle of the system builder or administrator. Under the concept of the large technological system (LTS), historian Thomas Hughes characterizes the evolution of the electrical grid as a complex
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