

# Chapter 2

## Urban Digital Infrastructuring and the (re)production of Privilege



The UDI Writers Collective

### 1 Introduction

A global digital and data revolution governs future urban strategies and profoundly influences the infrastructures built in cities. Numerous digital urban infrastructures remain hidden to city dwellers, all the while concurrently shaping, if not dictating, urban rhythms. Amin (2014) illustrates that an infrastructural view of the city enables us to perceive (i) the urban interweaving of social, material, and political elements; (ii) the degree to which smart city visions are infused with modernist ideals; and (iii) the way infrastructures mold positions and identities within city hierarchies. To underscore the final point, considering the processes within infrastructures helps us in understanding how they shape our daily experiences of cities. Simone notes (2015: 382) “urban residents are surrounded by discrepant infrastructural capacities” that are bound up with what infrastructures facilitate or restrict. An infrastructural perspective highlights the relational, and it questions how difference is constructed through relationships with human and non-human entities that either relegate people to the fringes or place them at the forefront of society (and often the city). This implies that the very systems that foster marginalization can also engender privilege. Consequently, we ask: what insights can we glean by focusing on how emerging digital urban infrastructures are scripting processes of privileging?

As digital infrastructures became more prevalent in cities, Longley (1998) asserted that “the cornerstones to urban digital infrastructure are hardware, software, and

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data.” However, what he overlooks in this characterization are the social and institutional components that also make up digital infrastructures. As Star and Ruhleder (1996: 113) remind us, “Infrastructure is ‘sunk’ into, inside of, other structures, social arrangements and technologies.” They thereby also underscore the relationality of what constitutes urban digital infrastructures (UDIs). In line with their argument, we adopt a broad understanding of UDIs that considers their digital, physical, and structural-institutional aspects as relational and embedded (Fig. 2.1). Although Fig. 2.1 represents the significance of data, software, and hardware equally, we acknowledge the increasing prevalence of data-based decision-making systems within UDIs (Bibri, 2021).

Eubanks (2019) shows how digital infrastructures and data-based systems have routinely denied the poor access to government assistance. By focusing on the evolution of infrastructure, or, in other words, the process of infrastructuring, we shift our

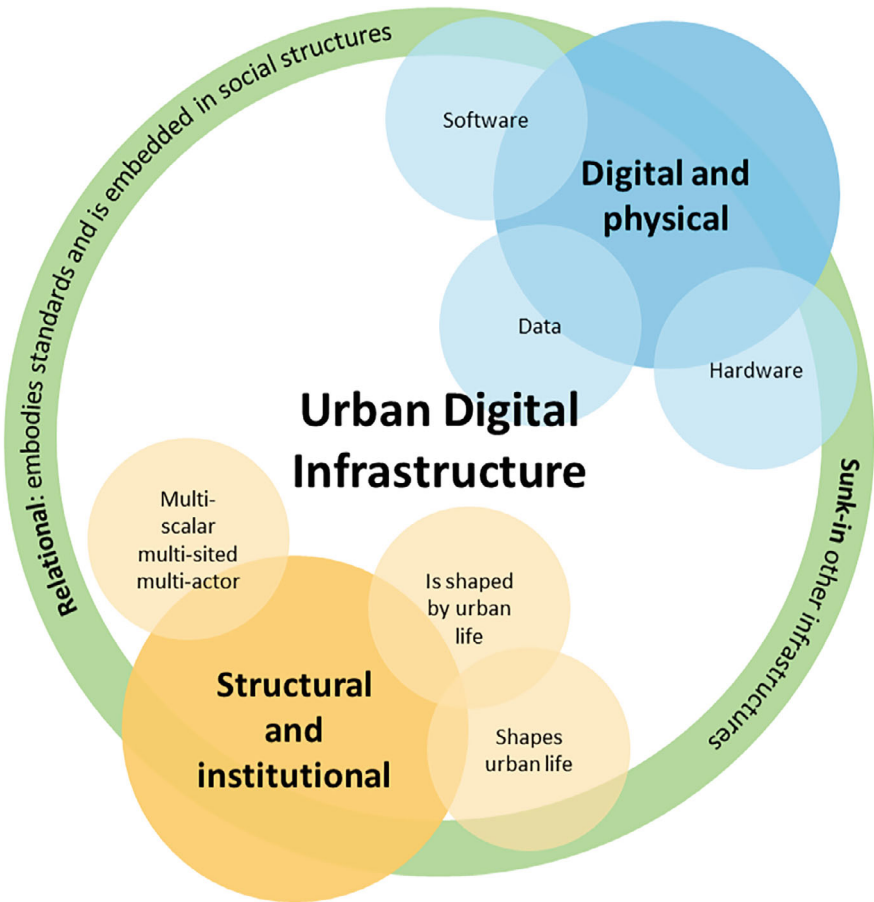


Fig. 2.1 Schematic depiction of the interrelatedness of urban digital infrastructures

attention towards the political frameworks and values that become ingrained in urban spaces. The science and technology literature highlights the tendencies of digital and information infrastructures to become invisible (Bowker et al., 2010) and emphasizes the importance of acknowledging that if systems work efficiently for most urban dwellers, they will scarcely be noticed. This is the case even if there are adverse social effects for some, either now or later down the line. As we observe in our discussions, UDIs are subject to such tendencies towards invisibility. Through this chapter, we argue that concentrating on processes of privileging may aid exposing those tendencies more clearly.

We provisionally define privilegization as the “hard-wiring” of access to power for certain urban population groups through newly developing digital infrastructures. We note that a focus on privilegization prompts us to pay attention to the processes and actors that make privilege possible, while seeing marginalization and privilegization as interconnected processes. Yet, as we explore in this chapter, reframing global urban transformations for sustainable development might necessitate understanding privilegization, and how its negative effects can be mitigated in the development and use of urban digital infrastructures.

To validate our suspicion that privilegization, through and with urban digital infrastructures, warrants attention, we chose to engage in a series of conversations with five activist-practitioners who are actively engaged in the creation, auditing, or challenging of emerging digital infrastructures or their usage in Colombia, India, Indonesia, and the Netherlands. Our conversation partners were not selected based on geographic location, but rather for their varied roles and knowledge about UDIs (see Table 2.1). To align with our broad definition of UDIs (Fig. 2.1), this includes people working on different “corners” of UDI, including individuals contemplating and developing social and governance structures of UDIs, activists interacting with local communities, and those involved in the innovation of UDIs. Each conversation adhered to a semi-structured interview guide. Besides encouraging our interlocutors to provide open-ended answers, we aimed to maintain the flow of the discussions by asking for feedback when possible and included comments from our interlocutors in this text. We quote directly from the transcribed conversations and present themes from a collective thematic analysis of those transcripts and the co-review process. The subsequent elaborations thus reflect on those conversations and themes we identified within them about privilegization as both an intended and unintended aspect of urban digital infrastructuring. Our conversations introduced two themes that are reflected in the structure of this paper. First, on the distinction between and asymmetry in focus on marginalization and privilegization. Second, on the understandings and actors of privilegization. In conclusion, we consider the potential of debating privilegization more directly to advance urban equity and sustainability.

**Table 2.1** Interlocutors contributing to this chapter

Interlocutor	Role	City	Initial
Hussain Indorewala	Action researcher/academic	Mumbai	HI
Ari Nurman	Action researcher/academic	Bandung	AN
Champak Rajagopal	Urban planner/academic	Bengaluru	CR
Luis Hernán Sáenz	Urban planner/activist	Bogota	LHS
Thijs Turel	Project manager on responsible urban innovation	Amsterdam	TT

## 2 The Asymmetry and Interlinkage of Marginalization and Privilegization

Marginalization and privilegization are interconnected so that “*the more privilegization, the greater the marginalization as well [...]*” (CR).<sup>2</sup> However, the majority of discussions on urban practices, policymaking, infrastructure development, and research tends to focus on processes of marginalization, with less consideration given to privilegization. In the discourses on UDIs, this chapter calls for a focus on two arguments from the UDI debate on privilege. First, focusing on privilege aids in understanding the vested interests of the rich within the city (Basu, 2019). Examining the relationship between privilegization in the city and the development of UDIs allows us to *explore how privilege is constructed through everyday urban practices*. A starting point here is the substantial body of research on *how the elite captures urban spaces through gentrification, gated communities, or the sanctioning of informal dwellings*. Fluri et al. (2022), for example, define the urban elite as the property and land-owning class capable of mobilizing governance and policy mechanisms to their advantage. Privilegization within UDIs seems to work in similar ways, though the digital aspect adds another layer of complexity to the uncovering of privilegization processes. Those complexities also entail shifts in who constitutes the urban elite as those who control, own, and promote UDIs’ experience as disproportionate gain in power.

Second, focusing on privilege reveals how biases and norms regarding poverty and wealth feed into the design of infrastructures. An important characteristic of privilegization is that those who are privileged are often unaware of the structural advantages from which they benefit. Their position is legitimized and often goes unquestioned within many societies. Investigating the processes of privilegization helps to challenge the dominant narrative of, for instance, racialized capitalism where *marginalized people are depicted as “underperformers,” while the privileged are seen as “winners,”* rather than considering marginalization and privilegization as consequences of socially unjust systems (Basu, 2019; Fluri et al., 2022). As one of our interlocutors noted, in the context of UDIs, the system propagating such processes does not necessarily have to be a capitalist one. Hence, our engagement with the concept of privilege and its production arises from the need to rethink the normative ways of how urban societies are categorized and question the promise of affluence and “modernist” progress.

Marginalization and privilegization within UDIs can be observed across various aspects of our day-to-day lives. Our interlocutor's comment on these, often relating to the access, development, and implementation of digital infrastructures' processes, strategies, and dynamics. There is a complexity attached to the set of roles we, the people, might play in UDIs (e.g., "*data producers*," "*data fiduciaries*," and "*data consumers*" (CR, see also: Khan & Pozen, 2019)). For instance, the ability to utilize (LHS) or be subject to collected data can determine how we experience UDIs (CR). These experiences are often driven by the roles we play within the infrastructures, our level of awareness of how UDIs operate, and how we can exercise our agency within such systems. The last two elements here are linked (CR). All these factors play into the degree of asymmetry in how we discuss the marginalization or privilegization of actors of urban digital infrastructuring. In this context of urban datafication and digital infrastructuring, how do we understand by marginalization? And, what do we understand by privilegization?

In our discussions, marginalization was frequently referred to in terms of spatial patterns of disadvantage, including forms of economic segregation. As one of our interlocutors noted "[...] *marginalized neighborhoods are those that are not connected to certain public services or that do not have proper access to certain urban services or that do not contribute in terms of taxation to urban development*" (LHS). The processes surrounding and embedding in the decision-making, design, development, and implementation of UDIs can generate different types of marginalization. These might be connected to how datafication—or "the growing presence, use and impact of data in social processes" (Heeks & Shekhar, 2019: 992)—unfolds, and how individuals' agency and power operate within it. Urban digital service provisions "*are designed to work for a large share of the population, and they're not necessarily designed to work for [...] the entire population. And the people who are kind of being left out of the design decision, those are the groups that are increasingly becoming marginalized*" (TT). The condition of being a "default data producer" leaves so-called data subjects with limited power to intervene in or make decisions about data collection, processing, and whom to trust with their data usage (CR).

In our conversations, there was a shared understanding of the processes of marginalization. In contrast, views on privilegization diverged, reflecting the diverse expertise of our interlocutors. Nonetheless, certain themes emerged that indicate privilegization as a multidimensional process within digital urban infrastructuring. Four aspects of everyday privilegization warrant emphasis. First, privilegization can be both structural and incidental. Overall, the concept of privilegization underscores the everyday practices in which the digital economy is widening the gap between under-connected and hyper-digitized spaces and communities within the city. In particular, structural privilegization through digital infrastructures must be considered within the context of capitalism and the ongoing legacy of colonialism (LHS). At the same time, digital technologies also privilege certain communities in incidental or haphazard ways, such as by facilitating political engagement for those who were previously disenfranchised (AN), or enhancing mobility for urban youth (TT).

Second, privilegization as a process and privilege as an outcome must be considered in relation to one another. In data systems and digital infrastructure, privilege is often discussed in terms of ownership and access or the capacity to benefit from using data and digital infrastructures. In such a context, having privilege involves possessing the power to access services, available spaces, and networks (CR); mobilize governments; or use UDIs as tools to further your own agenda. However, the conversations continuously emphasized the importance of considering the resulting processes as intersecting with structural inequalities within society such as “*class*” (CR), “*education,*” or privilege “*by where they live*” (TT), as “*people who can buy services,*” who have “*access to networks of social capital,*” or who are “*able bodied*” (HI and TT). Privilegization refers to the concentration and centralization of the data and digital infrastructures about and among some actors (CR).

Third, the actors involved in processes of privilegization are plural and multi-scalar. This includes public and private actors on local and global scales. The digital infrastructure created is designed, built, and controlled according to the logic of the private sector (LHS). Large corporations currently have the opportunity to operate without stringent governmental legislation holding them accountable (TT). Governments, functioning at different scales, are also seen as privileged entities within these contexts. For example, they not only act as “*custodians of data*” (CR) and utilize data for public benefit (LHS), but are also the enforcers of data-driven governance. Here, urban dwellers are viewed as consumers, and datafication processes are considered tools employed “*to control or dominate*” (HI).

Finally, privilegization can also be established, overturned, and resisted. However, it is essential to emphasize that not everyone currently possesses the ability to exert such influence. Recognizing these disparities also entails acknowledging that they are constructed, reproduced, and contested in diverse ways. While digital and physical infrastructures are intrinsically interconnected today, it was emphasized that digital infrastructures, unlike physical infrastructures, are less hard-wired and offer more flexibility in terms of how they operate and for whom. Often, a simple alteration of a single line of code is all it takes (TT). Power asymmetries are shifted in the case of digital infrastructures. It is less evident who is in control of this “*soft-wiring,*” such as data owners, custodians, and datafication promoters. This raises important questions about due democratic process (TT) and the actors involved in making privilegization more manifest. As several of our collaborators pointed out, marginalized actors are often not involved in re-imagining digital urban infrastructures. Marginalized communities do not have the opportunity to “*sit at the table*” and voice their suggestions or alternatives for digital infrastructural development due to the top-down fashion in which they are implemented. The speed with which UDIs are implemented and the power imbalances at play make it “*difficult to think about resistance. It is more about how I survive*” (HI).

### 3 Different Manifestations of Privilegization in Urban Digital Infrastructure

Next, our conversations provided initial insights into how privilegization manifested itself in the cities where our interlocutors worked. The purpose of UDIs in relation to privilegization was debated in four ways: (1) planning for the modernist city, (2) controlling the behavior of urban residents, (3) providing access to services and welfare, and (4) data as infrastructure. Many interlocutors discussed digital infrastructures that depend on mobile connectivity and the data as the by-product of widespread smartphone use. Some of them also reflected on the less immediately apparent or quotidianly haptic infrastructures that are also deeply part of contemporary city life, like transportation sensors, electricity flows, and digital health infrastructures. Our collaborators tended to point to the privilegization of those who have and know how to use mobile-connected devices and know to navigate the city [AN], while for the less visible digital infrastructures, direct privileging was often linked to pre-existing privilege among certain groups. Early adopters of technologies are placed in a privileged position by having the ability to request and utilize the necessary auxiliary digital infrastructures. Illustrative examples are the electric car charging stations and the decisions surrounding their placement and charging speed [TT]. What makes this example significant is the need for substantial foresight to anticipate how these early design decisions will impact future users.

Considering these insights on UDIs in the context of the marginalization/privilegization discussion, important questions arise: who holds control over these infrastructures and their products?, whom are they intended to serve? (LHS), “*who has influence over the functioning of these systems?*” (TT). Additionally, what values are embedded in these systems and infrastructure? (TT). In terms of equity and spatial justice, the most important questions center around the location of UDIs and who has control over and access to them. These questions do not have simple answers and are often accompanied by dual processes. For instance, the accelerated digitalization during the pandemic provided marginalized individuals with access to basic services that were previously unavailable to them (“*hack the pandemic*” (AN)). It also enabled their participation in online public meetings, which were previously inaccessible to them. At the same time, it is important to note that not all individuals possess digital literacy skills or have access to mobile phones. As a result, governments must maintain traditional methods such as in-person meetings and paper forms to ensure that people can apply for social benefits and engage with public services. Furthermore, during the pandemic, individuals in countries like India face exclusion if they are not connected to the digital ID infrastructure. As one of our interlocutors highlighted, “*a lot of people who cannot or are unable to sign up on that website find it very difficult to get vaccinated*” (HI). This underscores the barriers faced by certain populations in accessing vital services due to limitations in digital connectivity and ID systems.

Another important aspect that emerged is the ownership or control of the UDIs and the decision processes embedded within them. The traditional binary division

between private and public is becoming blurred, challenging terms such as “public–private partnerships.” For example, private companies often provide services in partnership with governments (LHS, CR, HI), blurring the line between public and private. The concept of the smart city is closely tied to what some refer to as “*corporate governance*,” where “*all city services would be linked to specific kinds of production of data and data being used as a form of management of those services; so, paid to use services and so on*” (HI). At the same time, residents and citizens function as both data consumers and data subjects, with limited rights and agency over the data processes that involve them (CR, HI). However, the complexity of these processes and the numerous actors involved in providing and controlling them pose challenges in holding responsible parties accountable when the usage, implementation, or impact of these infrastructures have adverse effects.

When asked about which actors should be involved in countering privilegization, our interlocutors generally suggested that those who are short-changed by the system are the ones who can educate us about the everyday impacts of digital infrastructures. They emphasized the importance of studying the interconnectedness of privilegization and marginalization. One of our interlocutors astutely noted, “*We have to walk those two ways at the same time*” [AN], connecting this assessment to urban sustainability and raising concerns about the possibility that the potential benefits of digitalization may bypass certain residents. At the same time, when questioning who needs to be included, the counter-question arises of how to ensure the preservation of spaces for resistance. In the context of demonetization—the transition to digital-only payments—one interlocutor noted that the top-down implementation approach provided little room for individuals to resist change [HI]. The pandemic crisis and the subsequent rapid acceleration of digital infrastructure programs often left little time for deliberation on whom to bring to the table. When closely examining these concerns in relation to sustainability, one of our interlocutors highlighted how market pressures hindered the establishment of a level playing field. In terms of sustainable energy, they noted, “*is very much dependent on data again, and so these certain kinds of markets will have much greater visibility of [] not just where development is going to occur, but where they can drive development*” [CR].

#### **4 Conclusion: How Can an Inclusive, Sustainable City Be Possible if Urban Digital Infrastructures Reproduce Privilege?**

Critical approaches to digital infrastructural urbanism highlight the connections between digital transformations and cities as sites where inequalities and exclusion are on the rise. There are clear tensions between the opportunities and threats presented by ongoing urban (digital) infrastructuring, particularly in relation to inclusive and sustainable city-making and digital urban citizenship. A focus on individuals in the most marginal positions has been crucial in our examination. However, in this



chapter, we have shifted our focus to understand the processes of privilegization that go hand in hand with the increasing significance of urban (digital) infrastructures.

Digital infrastructures have the potential to perpetuate deep-seated prejudices through their design and the distribution of access, resources, and influence over change (Eubanks, 2018). To examine the flip side of the coin, we began with a preliminary definition of privilegization as: the hard-wiring access to power for certain urban population groups through newly developing digital infrastructures. Through our exploration, we identified four key dimensions in our quest to define privilegization: (1) privilegization can take on structural or incidental forms, depending on the stage of development of specific UDIs and the unique characteristics of the spatial, political, economic, and social context; (2) privilegization is not only an outcome, but also an ongoing process; (3) the actors involved in privilegization are diverse and operate at various scales, encompassing multiple levels of influence and power; (4) privilegization can be both established and challenged, as it is not a fixed state but subject to change and resistance. A focus on privilegization necessitates examining who benefits from UDIs, when and under what circumstances, and how and why privilegization becomes embedded in the development of digital infrastructures.

To uncover the adverse effects of digital urban infrastructures and explore ways to mitigate them, we need to consider the interconnectedness and relational nature of these infrastructures. Although digital services and UDIs are intended to be accessible to all, certain factors such as digital literacy or access to smart devices can create privileged conditions for only a selected few within the same social group, thereby shifting from marginalization to privilegization. Moreover, the ability to redirect or repurpose existing digital infrastructures to align with new normative or governmental frameworks can present both risks and advantages. For example, in Indonesia, the accelerated digitalization during the pandemic enabled marginalized people to access basic services that were previously inaccessible to them.

As highlighted by several collaborators, marginalized actors are often excluded from the process of re-imagining UDIs. Marginalized communities are denied a seat at the table to voice their suggestions or alternatives for digital infrastructural development. Indeed, one of the most prevailing insights from our conversations is that while marginalization appears to be ever-present, privilegization is deeply entrenched with emerging digital infrastructures. Its tangible impact, however, may only become apparent when there is a scarcity of the resources provided by those particular infrastructures. A prominent example of this is the availability of Internet bandwidth, which affects the speed at which different actors can navigate UDIs. Similarly, access to electricity during periods of high demand and the ability to access specific healthcare services are other instances where the effects of privilegization become evident.

Therefore, we contend that in order to understand structural inequalities and their entrenchment, as well as perpetuation, by digital infrastructures, we have to study the various processes that contribute to both marginalization *and* privilegization. By delving into these processes, we can gain a comprehensive understanding of the powerful actors—privileged people and organizations—who develop and own digital infrastructures. Similar to how the car industry lobbied for suburbanization in

the early twentieth century, perpetuating privilege for some but not others, the urban tech industry is driving an international agenda of sustainable development that often prioritizes the vision of smart and green cities for privileged elites. Studying these processes and actors helps uncover the vested interests of the privileged in structuring digital infrastructure. Furthermore, it aids in understanding the relationship between the rich and the poor within the city. Looking at these processes as relational and processual provides a framework for understanding how digital infrastructures (re)configure the urban as a socio-technical context. It highlights the embedded normativity within digital urban infrastructures and the incentives it generates. Importantly, focusing on privilegization reveals what often remains invisible when infrastructures are “sunk-in” and cater to large parts of the population, yet inevitably exclude certain groups.

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