Urban Planning
2024 • Volume 9 • Article 8480
https://doi.org/10.17645/up.8480

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Open Access Journal

Digital Arrival Infrastructures: Housing Platforms and Residency Governance in Berlin's Rental Sector

Leah Aaron

Bartlett School of Planning, University College London, UK

Correspondence: Leah Aaron (leah.aaron.16@ucl.ac.uk)

Submitted: 22 April 2024 **Accepted:** 16 August 2024 **Published:** 31 October 2024

Issue: This article is part of the issue "Urban In/Formalities: How Arrival Infrastructures Shape Newcomers' Access To Resources" edited by Heike Hanhörster (Technical University Berlin), Martina Bovo (IUAV University of Venice / Politecnico di Milano), Miriam Neßler (Technical University Berlin), and Susanne Wessendorf (Coventry University), fully open access at https://doi.org/10.17645/up.i396

Abstract

This article explores how notions of formality and informality in housing are produced in relation to digital infrastructure and localized bordering regimes. Drawing on a research diary project conducted with "International" migrants in Berlin, Germany, I draw on scholarship in Digital Geography and Migration Studies to frame digital platforms as "arrival infrastructures," which allow "Internationals" to negotiate the legal process of becoming formally resident in the city. Rather than entry into the long-term "formal," rental sector, the opportunity to codify residency status becomes the decisive factor in determining housing choices. It also determines the type of housing platforms which are used to seek accommodation in the city and influences digital behavior. My contribution in this article is twofold. Firstly, I advance an understanding of housing in/formality as a concept which is formed according to one's own positionality in relation to State mobility regimes. Secondly, I describe how the interface of platform-mediated rental sites becomes a site of knowledge production about norms and behavior within an unfamiliar housing system. This is accomplished through the proposal of a typology which classifies platform services according to the ways in which they used to negotiate residency governance regimes: large and long-term housing platforms; "medium-term" platform-mediated rentals; platforms rented and shared; and supplementary tools. I conclude by highlighting the need for further research into the role of rental platforms as a bordering technology, especially in the European context.

Keywords

Berlin; housing; informalities; middling migrant; platform real estate; privileged mobilities; registration; sublet; tenant

1. Introduction

Over the last decade, the platform has emerged as a core technology of the digital economy. Platforms capture value and generate revenue by providing an arena for goods and services to be traded between various types of user. A key characteristic of platforms is that they embed themselves within previously "informal" sectors of the economy, regularizing transactions which would once have been difficult to trace (Richardson, 2020). Consequently, they have been framed as both social (Rodgers & Moore, 2020), technical (Srnicek, 2017), and economic (Andersson Schwarz, 2017) infrastructures, whose "logic" governs increasingly large aspects of contemporary urban life in cities across the globe. In this article, I draw on this infrastructural framing of the platform to explore the ways in which "Internationals," "middling" migrants (Conradson & Latham, 2005) in Berlin, Germany, leverage the platform as infrastructures for exchange within the rental market. In a city where housing is extremely scarce, different platforms gear themselves toward more and less formal sectors of the rental market. These are enmeshed with social media groups and messaging app "communities." I argue that these platforms form a socio-technical "infrastructure," which allow "Internationals" unfamiliar with the city's competitive rental sector a way to find accommodation by leveraging the technical. This infrastructural framing also allows me to demonstrate how this "International" group comes to form its own concepts of housing formality and informality in relation to Berlin's vast secondary rental market (Häußler, 2022). These are not formed with reference to normative housing trajectories but to digital platforms and their own positionality as ambivalently "privileged" migrants, linked to the governance of residency and to local-level border regimes (Gargiulo, 2023; Lebuhn, 2013a).

Platform services are constrained in different ways by residency governance regimes. Although middling migrants in Berlin are afforded relative flexibility in their housing choices in comparison to other migrant groups, often thanks to professional jobs and/or "strong" passports (Mancinelli & Germann Molz, 2024), their position in relation to local border regimes produces specific conditions of precarity. Platforms provide a means not only to access physical space but also Registration (*Anmeldung*), a bureaucratic status which "performs the existence" of residing at a specific address (Gargiulo, 2023). Drawing on data generated from a research diary project with "International" Berliners, I argue that Registered status predicates access to the long-term, "formal," rental sector, because the platforms which cater to this section of the market use identity verification features which require registration to work. Further, I claim that concepts of "formality" within Berlin's secondary housing market can be understood in reference to Registration. Preferential visa regimes mean that those without EU-Citizenship, or who are excluded from schemes such as the "working holiday," visa, are under more pressure to complete Registration than others. I show how visa status affects housing preferences, such as rent price and location, as well as digital behaviors.

Two central advantages of platforms as a technology are their interoperability and their ability to be adapted by their users (Helmond, 2015). I show that platforms operating in the rental sector are connected to one another not only technically, but also socially, forming a multi-platform socio-technical urban infrastructure. Further, I demonstrate how these platforms are embedded with the state at the federal and local level, through the laws and bureaucratic structures which govern residency through "registration" in a particular locale. These localized border regimes (Gargiulo, 2023; Lebuhn, 2013a) act as constraints against which newcomers, as well as platform services, adapt, extending Mancinelli and Germann Molz's (2024) contention that middle-class mobilities are enacted with as well as against the State. Although middling migrants in Berlin are afforded relative flexibility in their housing choices, in comparison to other migrant groups, thanks

to largely professional jobs and secure visa statuses, their position in relation to local border regimes produces specific conditions of precarity. These experiences begin at the platform interface and are further exacerbated by intersectional experiences of discrimination.

The article proceeds as follows: First, I give an overview of the current rental crisis in Berlin and trace the emergence of a secondary market governed by alternative "sub-rental" contracts. Then, I turn to the platforms, contextualizing their emergence within debates around the current shortage of affordable housing in Berlin and the exacerbating role of "privileged" migration. In the section thereafter, my attention turns to the role of local government bordering regimes in constituting this digital arrival infrastructure, drawing on scholarship which frames registration as a central technique through which the governance of border regimes is outsourced to the local level (Gargiulo, 2017; Lebuhn, 2013a; Lebuhn & Holm, 2020). Finally, I synthesize this with the empirical data, building up a rough typology of platforms according to the way in which their use is constrained by residency governance regimes. These are large and long-term housing platforms; "medium-term" platform-mediated rentals (PMRs); platforms rented and shared; and supplementary tools. I then conclude by calling for further research at the intersection of Digital Geography and Migration Studies which engages more fully with "PropTech" platform use (Fields & Rogers, 2021).

2. Housing in Berlin: *Hauptmiete* and *Untermiete*

The city-state of Berlin currently faces both a housing shortage *and* a housing affordability crisis. Its Senate has estimated that the city will require 197,000 new homes by 2030 in order to cope with rapid population growth (Senatsverwaltung für & Stadtentwicklung, Bauen und Wohnen, 2019). However, even with new-build completion at around 17,000 new homes per year (Lindenberg, 2022), the specific dynamics of tenure allocation give rise to vast inequalities. Berlin is a city characterised by low-rates of owner-occupation (around 17%) even for Germany, the "nation of renters" (Aalbers, 2016; Investitionsbank Berlin, 2022). Most policy debate has been focused on the provision of long-term rental contracts (*Hauptmietverträge*). This type of contract is directly between one or several "head" or "chief" tenants (*Hauptmieter*) and the landlord (*Vermieter*). They are often open-ended, with rent rises minimised or controlled. However, in a context of rising rents, strict affordability criteria for new contracts leaves *Hauptmietverträge* increasingly out of reach for many Berliners. The ongoing housing shortage has given rise to a vast secondary market of sublets, where long-term contract holders (*Hauptmieter*) sub-lease all or part of their home to an *Untermieter* (subtenant). These subletting arrangements (*Untermietverhältnisse)* are leveraged by a vast array of different actors, from individuals looking to rent out their flat while they spend time abroad, to companies renting out "furbished" apartments on a month-by-month basis. *Untermietverhältnisse* are highly heterogenous. While some are arranged completely verbally without the landlord's knowledge, others might be standardised, lengthy documents sent out by a serviced apartment company's legal department. The least formalised *Untermietverhältnisse* allow subtenants to live in the property without formally occupying it—this is an important aspect which will I return to throughout this article. Unlike *Hauptmietverträge*, which are federally regulated by Germany's civil code (*BGB §535—§548*, 2023), *Untermietverträge* exist directly between the "head" tenant and subtenant. Subtenants are much more easily evicted than "head" tenants, even under the most formalised contracts.

This growth in the use of *Untermietverträge* has developed in parallel with the accelerating digitisation of Berlin's Real Estate market. This has emerged in turn against a backdrop of increasing in-flows of

transnational mobility to the city, partly incentivised by the Federal government's push to address worker shortages through skilled migration (Die Bundesregierung, 2024). Digital platforms now play a central role in facilitating the exchange of both *Hauptmietverträge* and *Untermietverträge*, with the distinction between the two often unclear to the user. The relative flexibility of *Untermietverträge* means that they are characterised by fine gradations of rights, protections, and legality. Platforms follow an economic logic which monetises the exchange of an object rather than the object itself (Srnicek, 2017). The most popular platforms in Berlin, *Immobilienscout24* and *WG-Gesucht*, allow users to filter and sort listings by housing characteristics (size, rent price, or area). However, it is much harder to distinguish between different types of provider (e.g., "furbished" room providers, chief tenants, private landlords, or large housing companies) or to establish what the legal basis for occupation would be. Users are left to assess this through clues in the listing's text or images.

3. Rental Platforms: "Arrival Infrastructures" for the "Middling" Migrant

The figure of the "middling" migrant has emerged in recent years in concert with a growing interest in the way various forms of capital facilitate and constrain transnational mobilities. Studies of middle-class mobilities such as retirement migrants (Botterill, 2017) or digital nomads (Hannonen, 2020) emphasize that despite the heterogeneity of these groups' motivation for spending time abroad, their relatively privileged status "often hides financial insecurity, employment and visa obligations, or housing insecurity" (Mancinelli & Germann Molz, 2024, p. 190). Structures of the State designed to enforce the social contract through residency emerge as sites of "friction," which continue to contour how "middling" migrants are able to move through and across geographies (Cresswell, 2014; Tsing, 2005). Whilst they might be able to leverage privileges such as strong passports or desirable professional skills in order to negotiate residency, "middling" migrants often remain excluded from the welfare regimes enjoyed by citizens (Cook, 2022). Moreover, the forms of social and cultural capital they carry make it easier to live and socialize in prestige languages such as English, impairing their ability to accrue cultural knowledge necessary to negotiate institutions and infrastructures in the long-term (Barwick, 2022; Garcia, 2015).

Popular accounts attribute the current shortage of available homes in Berlin's rental sector to migration-fuelled population growth as well as affluent mobilities such as tourism (Guthmann, 2021; Hollersen, 2022; Mayer, 2013). Since the launch of *AirBnB* in Germany in 2013, the impact of short-term (ST) "holiday" style PMRs (ST-PMRs) have been the subject of extensive debate and controversy because of their relationship to increasing flows of affluent ST mobility (Aguilera et al., 2021; Coyle & Yeung, 2016; Gutiérrez et al., 2017). However, their role as facilitators of longer-term mobilities or permanent settlement in European housing markets has attracted less attention. Moreover, the intensive focus on ST-PMR's has distracted scholars from the diversification of the market. *AirBnB* now exists in Berlin alongside multiple "medium to long-term" digital housing providers like *Habyt*, *HousingAnywhere*, *Wunderflats*, or *SpotAHome*, all of which adopt different approaches to revenue generation. While some, like *Habyt*, offer serviced apartments with an *AirBnB*-style interface, others, like *Wunderflats*, make money by providing a space for "multi-sided market exchange" between landlords and tenants (Andersson Schwarz, 2017; Habyt, 2023a; Wunderflats, n.d.). These services exist alongside—and often advertise on—platforms which cater primarily to the long-term housing sector, whose existence long predates that of "disruptive" *AirBnB*. *Immoscout24*, and *WG-Gesucht*, two of the most well-known of these in Berlin, both of which have been around since the late 1990s (Rother, 2000). While discourses around *AirBnB* in Berlin link it to consumption-led, "taste-based"

gentrification and associated negative externalities, including urban displacement (Duso et al., 2020; Polat, 2015), the lack of attention on the emergence of the platform housing sector as a whole means that little is known about the way these platforms facilitate access to different housing arrangements. The current pressure on the rental sector in Berlin has also highlighted the importance of the platform as a stopgap for "middling" and affluent transnationals who can afford its elevated prices while they wait to access the formal rental sector (Novy, 2018).

Platforms operate "in the shadow" of formal rental regulations (Ferreri & Sanyal, 2022). Maalsen (2020a) and Maalsen and Gurran (2020) have highlighted how the high visibility of digital rental platforms makes them available to users far outside their geographical locale, making it theoretically possible to find accommodation from anywhere on the globe. Most rental platforms in Berlin offer multi-lingual interfaces, making them accessible to those without German language skills. In the absence of social connections, which Bernt et al. (2022) emphasize have particular importance in urban housing markets in Germany, they promise to quickly and efficiently facilitate access to accommodation. However, their position as commercial entities designed to extract revenue, combined with extreme imbalances in supply and demand in Berlin's rental sector, make this promise largely illusory in practice. Premium subscription programs, the processing and analysis of user data, and paid-ad space are commonplace means by which housing platforms in Berlin seek to generate profit. As Nasreen and Ruming (2021) point out, these profit motives would incentivize longer and more intensive use of housing platforms rather than quick securing of accommodation.

4. Registration, Residency, and Secondary Housing Markets

Registration is a bureaucratic process which allows governments to keep an up-to-date tally of the number of residents within a given area by recording changes of address. It is practiced in several European countries including Germany, Italy, the Netherlands, and Spain. In these jurisdictions, being "registered" is equivalent to occupying a property, ontologically preceding "the material condition of living somewhere" (Gargiulo, 2023, p. 68). As such, in the years since the Schengen Agreement, it has emerged as a tool to "outsource" the governance of non-citizen residents to local government actors. In the German context, Registration is a necessary perquisite to gain access to an array of essential services, including receiving government correspondence, ordering a SIM card, opening a bank account, or joining the library (Lebuhn, 2013a, 2013b), in part because of Germany's continued reliance on the traditional post (Distel, 2022). Since 2015, the registration process has required written permission from an apartment's owner, which is then checked against a land-registry database at an in-person appointment at a local government office (BMG, 2013).

Rental platforms have been seen to be generative of novel informalities (Ferreri & Sanyal, 2022). As Gillespie's (2010) now-classic paper argues, the term "platform" does extensive rhetorical work in sidestepping responsibility for platforms' content. Although landlords and *Vermieter* alike are legally required to provide the documents necessary to Register, in practice this is poorly enforced. Landlords retain powers of veto in allowing tenants to sublet. Many tenants therefore sublet their apartments with the explicit caveat that Registration at the property will not be possible. While the most well-known platforms, like *WG-Gesucht*, do little to police the large volume of "no Registration" listings on their pages, others in the "medium to long-term" space make the Registration an explicit part of their market positioning. For example, *Habyt* and *HousingAnywhere* both state that they offer only Registered accommodation on their FAQ page.

Remaining unregistered can have advantages. For those with EU passports, living without registration means no changes in tax residency as well as continuing to benefit from their home country's health insurance regime. Those who can enter Germany visa-free, such as US, UK, Australian, or New Zealand citizens, might be able to continue to work remotely for up to six months, leaving the EU once their tourist visa has expired. For those without these privileges, however, remaining invisible to the State can curtail one's ability to become embedded with institutions and infrastructures to an intolerable degree (Horton & Heyman, 2020). Both shared living and sub-tenancy arrangements can be difficult to negotiate and produce feelings of vulnerability (Clark et al., 2018; Ortega-Alcázar & Wilkinson, 2021). This is exacerbated by the legal structures which govern shared housing in Germany, in which head tenants dictate the terms of tenancy to other occupants or sub-tenants (Nöllke, 2023). Credit-referencing reports like the SCHUFA, a mandatory document for applying for most apartments, collect data on financial arrangements made within German territory (SCHUFA, 2023). Not being registered precludes access to the SCHUFA and other documents which can only be sent to a Registered address, such as letters from the tax office. Students are also unable to access the funds in the blocked account required to be opened for their visas—the amount currently required is €11,208 (Auswaertiges Amt, 2023). The following sections draw on empirical material to consider how the material condition of housing is negotiated for digitally, alongside, and sometimes secondary to, Registration.

5. Methodology

Digital practices are difficult to study in part because they are largely non-verbal, carried out through haptic gestures and touch. The insights in this article are drawn primarily from a research diary project, a method which aims to externalise the "emic perspectives"—the ephemeral and mundane thoughts and feelings of digital users—across a period of time (Shankar et al., 2018). By adapting the "Diary: Diary-Interview" method (Latham, 2003; Zimmerman & Wieder, 1977), participants were given space to reflect on the fluctuating nature of housing platform use, which tended to follow a pattern of high intensity followed by fatigue. The durational nature of the method also allowed me to track how participants' understanding and expectations of the housing system in Germany shifted over the course of the project. By the end of our time together, participants who were new to Berlin had shifted their understanding of what constituted a "formal" housing arrangement substantially, coming to reference it in relation to their own needs.

The research diary projected was conducted over a period of 14 days in Summer 2022. Six participants were involved, with an additional five participants supplementing this material with a one-hour semi structured interview. They were recruited via social media groups and email lists catering to "Internationals" in Berlin, a byword for educated "middling transnationals" (Barwick, 2022). Diarists completed an initial 30-minute intake interview, where they were asked about their experiences with housing in Berlin as well as elsewhere. Over the following 14 days, they were then sent a daily prompt via message asking them to reflect on their housing search that day. The intention was to capture the potentially hidden effects of "digital labour," the affective and repetitive work of clicking and checking the platform on a mundane level (Kuehn & Corrigan, 2013; Maalsen, 2020b). Following completion of this period, a follow-up interview was conducted. Here, participants were asked to comment on selected diary entries. Interviews took place mostly online, with one participant preferring to meet in person. Diary entries were sent via message, email and voice message, transcribed, and thematically analysed along with the interview material. What emerged from this process

was that the need to obtain or maintain Registered status determined the housing search's affective dimensions, correlating with increased feelings of stress.

The level of in/formality which participants could tolerate was also related to the institutional and social connections which underpin urban citizenship (Lebuhn, 2013a). Of the 11 participants in the study, 10 had citizenship from outside the EU and were on time-limited visas. Five had been living in the city for over two years, two had resided there on and off again for long periods, and three were new arrivals who had never lived in Berlin. Those with pre-existing connections to Berlin were more likely to have access to services which required Registration to access but not to maintain, such as bank accounts, or indeed social connections to homeowners or "chief tenants" at whose apartment they could register.

All those participating in the study had completed higher level education or equivalent. Participants' employment status had an effect on which platforms they favoured, as those with more secure employment were generally aiming to enter the long-term rental sector. Freelancers working in the arts ($n = 2$) those in postgraduate education ($n = 1$), and those on ST contracts ($n = 1$) were largely confined to shared and ST housing, as were those who had recently moved to Berlin to start a new job ($n = 2$). This meant engaging with platforms geared towards the shared and sublet sector. Only those in secure work—"working in tech" or consultancy—made intensive use of *Immoscout24*, which positions itself as offering entry into the long-term rental sector.

Table 1 lists all of the platforms participants used to seek housing over the course of the project.

The diary project revealed a rough typology of platform use, which depended on participants' required tenure type, required tenure length, and Registered/Unregistered status. Further analysis of the company information available for each of the 13 platforms mentioned in the project, as well as an additional 98 other digital housing entities currently operational in Berlin, allowed me to refine this further. The discussion is structured into four sections, which give an overview of how platform use is constrained by Registration as a residency regime. These are: large and long-term housing platforms; "medium-term" platform-mediated rentals (PMRs); platforms rented and shared; and supplementary tools.

Table 1. Platforms used by participants.

Platform	Used by × participants ($n = 11$)
Immoscout24.de	11
Kleinanzeigen.de	10
Facebook Groups	10
WG-Gesucht.de	9
Reddit page u/berlinsocialclub	3
Habyt	2
Immonet	2
Immowelt	2
HousingAnywhere	1
Wunderflats	1
WGCompany.de	1

6. Large and Long-Term Housing Platforms: *Immoscout*, *Immowelt*, and *Immonet*

Housing platforms which are geared towards entry into the long-term rental sector offer a range of automated identity verification and credit checks (Ferreri & Sanyal, 2022). These promise to make the process more convenient whilst reducing risk for landlords and estate agents. Yet these services usually require Registration,which "performs" occupancy in German territory (Gargiulo, 2023), in order to engage with them. It was through their use of *Immoscout24*, *Immowelt*, and *Immonet*, Germany's three largest housing platforms, that participants learned that they would not be able to enter into a long-term rental contract as a "head" tenant without first entering into a more informal one in which they could register:

> I wasn't even here [in Berlin] and already I had an *Immoscout24* premium membership. But then I mostly stopped applying on *Immoscout24*, because I figured that it wasn't really going to help. Even if I got any responses on *Immoscout24*, they were all really far away for one. But even if I got any responses, I did not have a SCHUFA, I didn't have any of that. It was really frustrating. (Participant A)

Housing platforms theoretically open up the practice of searching for housing from anywhere (Maalsen, 2020b). In practice however, a lack of formal residency in the location where housing is sought acts as a significant barrier. Whilst the SCHUFA credit check can be ordered online, it requires a registered address in order to confirm the applicant's identity (SCHUFA, 2023). Participant A had been advised by friends already in Berlin that an *Immoscout24* premium subscription—*MieterPlus+* was necessary in order to remain competitive on the platform, as it allows users to receive notifications of new listings first. However, compared to other premium user profiles, theirs attracted less attention. Without registration they were unable to produce a SCHUFA. They attempted to mitigate this handicap by applying to listings in more peripheral districts, further from valued amenities:

> It's never a matter of oh, it's close to a park, because that's not a choice that you can make anymore….I do know of people my age who would prefer to live like, within the more densely populated areas, but they couldn't find a place and now they're living on the outskirts. And they do dislike the fact that when they go out, there's nothing. (Participant A)

Immoscout24 and its competitor platforms, like *Immowelt*, incorporate tenant identity verification technologies which are embedded within national apparatuses of the regulation of non-citizens. Participants quickly come to see how these services enact barriers not only to entering the formal rental sector, but to living in desirable areas of the city, reifying existing exclusions experienced by migratory housing seekers (Bernt et al., 2022). Through engagement with these larger platforms, users begin to understand the importance of Registration within their new life in Germany as well as a barrier to accessing housing.

7. "Medium-Term" PMRs: *Habyt*, *SpotAHome*, *HousingAnywhere*, and *Wunderflats*

Sites like *Habyt*, *SpotAHome*, and *HousingAnywhere* have similar interfaces and functionality to ST-PMRs like *AirBnB*. However, they avoid the restrictions on the misuse of residential dwellings in Berlin by only offering rental periods of over 30 days (Zweckentfremdungsverbot-Gesetz—ZwVbG, 2013, § 1—§ 6a). They thus frame themselves as offering "medium- and long-term" furnished living (HousingAnywhere, n.d.).

This was seen as these "medium-term" platforms' central advantage, as in contrast to *AirBnB*, booking a property also confers "guests" legal residency, with Registration an explicit guarantee (Habyt, 2023b). However, their listings are generally more expensive than those seen either on "long-term" or "rented and shared" housing platforms. Four participants made use of medium-term PMRs over the course of the project, with the explicit aim of securing or maintaining Registration. Those with the requisite funds viewed the high rental prices quoted on the platform as worth paying in order to extricate themselves from the problems associated with no registration. For example, no registration meant that Participant F was unable to apply for his work visa, meaning he was unable to start the job he had relocated to Berlin for:

> So eventually I found an apartment on *HousingAnywhere*. I first saw an apartment in *Moabit* which was beautiful…but unfortunately, I didn't get it. And I had opportunity lined up to get something from *HousingAnywhere* for 900. It's terrible, like 15 meter apartments, somewhere like in some horrible little place, but it was, I think 900. And it was immediate and could get *Anmeldung* [Registration]. It was three months or something like that. (Participant F)

This framing of medium term platforms illustrates Novy's (2018) point about the potential for ST-PMRs to function as a housing stopgap as well as a tourist amenity, and illustrates longer-term changes in the sector as it responds to policy changes and post-COVID working and living patterns (Aguilera et al., 2021). Although investigations into middle-class mobilities such as "digital nomads" have highlighted the role short- and medium-term housing platforms play in facilitating living and working abroad (Mancinelli & Germann Molz, 2024), less is known about *why* and *how* people make use of housing platforms in response to local regulations, or across disparate mobile groups. In Berlin, the rental sector is predominated by long-term tenancies, meaning that there is a lower rate of turnover in the market compared to cities like London where tenancies generally run for twelve months or less. The rise to prominence in recent years of this new group of "medium-term" PMRs could be explained in terms of these migratory precarities. By only allowing "stays" of over 30 days, they operate within a regulatory framework of "temporary furnished apartments" and not holiday lettings, a middle space on a hierarchy of renter protections. Thus, they respond both to the increasing regulation of the ST-PMR space and to novel forms of precarity generated at the intersection of rental crisis and visa regulations.

8. Platforms Rented and Shared: *WG-Gesucht* and *WG-Company*

Shared rental housing platforms were considered to be the most accessible for those without Registration, whose status prevented them from accessing the required documents to make use of "formal" rental platforms and who might lack the funds to utilise ST-PMRs. All participants made use of this form of site, not out of any particular desire to live with others but as an accessible means to becoming Registered. *WG-Gesucht.de* and *WGCompany.de* were cited as the most important platforms designed to facilitate the selection of flatmates based on shared affinities and approaches to sharing space (Maalsen & Gurran, 2020; Nasreen & Ruming, 2021). However, the discrepancy between the supply of Registered living situations on the platform and the demand for them created power asymmetries. These were seen to be enacted through the repetitive and emotionally taxing work involved:

> It just seems like you can't have any personality or like, be a body that actually takes up space. And I get frustrated. It really feels like they want such specific people or they don't want to bother and have just,

> like, a statue. But at the end of the day, they have all the power so I just have to try and like, remove myself from it. (Participant B)

In contrast to ST-PMR style platforms, this set of sites is primarily "facilitative," generating revenue through ad space rather than by taking commission and offer little in the way of arbitration should things go wrong (Nasreen & Ruming, 2021). As such, while rental prices might be lower than on ST-PMR sites, monetary savings are offset by the degree of affective and repetitive work involved in selecting listings and self-positioning oneself as the "ideal" flatmate (Maalsen, 2019, 2020b). Rented and shared housing platforms in Berlin reflect the city's renter-dominated system of housing provision as well as its history as a hotbed of communal living experiments (Hannah, 2017). *WG-Gesucht* and *WGCompany* were both founded in the late 1990s and are primarily text based. *WG-Gesucht* offers the ability to filter by price, "temporariness," location and room size, as well as through generic categorisation of different styles of living arrangement which remain uncodified in the Anglophone world, such as the *Zweck-WG*, a flatshare in which only physical space is shared. Entering into the "informal" shared housing sector requires significant self-positioning work, in particular around the theme of attitudes towards the sharing of domestic space (Heath et al., 2017; Maalsen, 2019; Maalsen & Gurran, 2020). Consequently, not only is significant work is required to successfully obtain Registered housing on these platforms, but there is also a sense of Registration as a kind of asset, which can be traded in exchange for compliance with the "rules" of the flatshare:

> I kind of felt like if I applied to more ads of this kind, I was kind of going to have to cater to what the other person wants. Depending on how they write the thing, especially on WG-Gesucht, I alter my message to them accordingly….It's more like you're having to cater to their demands, and possibly when you do live together, it can be the same way….I've seen a lot of people be like "It's going to be temporary for a month and then we'll see how it goes. (Participant A)

Descriptions such as these were common among those interviewed and were felt to be emblematic of a more general power dynamic. New roommates, or indeed any nominally temporary occupant, are reliant on the existing tenant to correspond directly with the landlord in order to become registered (BMG, 2013). To participants, therefore, these existing tenants hold a prerogative over their access to much-desired services. Participants framed their "self-positioning work" primarily in terms of how to conceal their growing frustration at not being able to secure Registered housing in a context of precarious residency status. That recent migrants tend to be forced into more unstable accommodation is of course a longstanding concern in Urban Studies (Abrams, 1955; Glass & Pollins, 1961). The data here shows that the digitisation of rental housing exchange regularise these longstanding tendencies, not only through the functionality and design of the platform (Ferreri & Sanyal, 2022) but in terms of how choices between platforms are made.

9. Supplementary Tools

In addition to those discussed above, participants engaged with a further set of digital tools in order to develop their understanding of how these platforms fit together and thereby conduct "self-positioning work" most effectively (Maalsen, 2020b). A common theme here concerned how to navigate housing discrimination and overcome issues associated with Registration. Reddit emerged as an important digital platform used for this purpose, specifically the subreddits *u/berlinsocialclub* and *u/berlin*. Selecting new tenants on the basis of shared social, economic, or ethnic background is common, particularly in shared living situations (Clark & Tuffin, 2015;

Clark et al., 2018). Housing discrimination in urban housing markets in Germany is widespread. It has been framed as stemming from a desire to encourage appropriate "social mix" and avoid problems associated with urban segregation (Hanhörster & Ramos Lobato, 2021; Münch, 2009).

Using housing platforms on one's own means that there is little way of comparing the "success" of one application to those of others, although showing users their relative "chances" when viewing a listing is an important revenue generation strategy for *Immoscout* and *WG-Gesucht*. To most participants, who had experienced little friction when looking for accommodation in their home context, encountering barriers to accessing housing was a new experience. Reddit functioned as a way to compare their experiences with others'. In so doing, they came to understand themselves as subjects of a discriminatory housing system. The u/berlin subreddit allowed them to access tools and resources which promised to make the search for housing more efficient.

Four participants described making extensive use of the "wiki," an assembled body of knowledge pinned to the page summarising the forum's tips to help non-German users navigate Berlin's rental sector on *u/berlin*. It was described as a place to ask for advice and to debate current issues in Berlin's housing landscape. As such, it emerged as an important adjunct to the platforms discussed above, expediting the process of learning how to appear as a desirable tenant in a new and unfamiliar context, which was otherwise a process of trial and error. *u/berlinsocialclub* helped participants to navigate the problematics of registration by directing them towards specific housing platforms. It directed them to use "housing hacks" (Maalsen, 2022) such as telegram bots with access to platform APIs. It also functioned as a place where suspicions about potential housing discrimination could be confirmed:

> I don't know if you, you also saw this on the Berlin Reddit, the Social Club, that somebody posted an experiment that they had done. I mean, I've heard this already before. But this was just like, maybe that was pretty recently, actually, that he had an Indian name and his girlfriend had a German one. And they were doing the exact same application, and she would get called [back]. (Participant H, Interview 2)

Of course, this is a variation on a classical sociological field experiment commonly deployed in housing studies to measure housing discrimination (see Carlsson & Eriksson, 2015; Sawert, 2020). Similar instances were described by two other interviewees (it was not possible to verify whether they were discussing the same post). The use of experiments such as these indicates a familiarity with social science methods—which are also now widely deployed commercially in market research and service design (Grant, 2018). It also suggests the extent to which digitized housing discrimination has become problematized for this demographic of "Internationals," who tend to intervene individually rather than engage with local politicians or campaign groups. This reflects longstanding divides between themselves and the German-speaking political and media landscape to whom they are ambivalently "tourist" or "migrant" (Garcia, 2015). Here, *Reddit* acts as a supplementary resource and crowdsourced directory which gives a coherent shape to multiple and competing digital housing platforms.

10. Conclusion

This article has highlighted the way digital housing platforms are embedded within State regimes which regulate the presence of foreign nationals. My aim in doing so is to reignite debates around the role of

Registration in Germany as an everyday bordering practice (Lebuhn, 2013a, 2013b). I have explored how the literature on the digitization of the shared and "informal" rental sector might be extended in concert with a more contextualised understanding of the politics of mobility in the German context. Registered status has an impact on how digital platforms are selected and the way in which they are used. Further, registration is one criteria by which we might measure housing "formality" within Berlin's platform-mediated temporary and shared rental sector. However, the limited scope of this article means that there has neither been the space to discuss the ways in which other forms of regulation may affect housing platform use, or to engage with what Maalsen (2022) has called the "ambivalences" inherent to digitised housing informality, such as the potential for increased flexibility of tenure. However, the insights presented here point us in the direction of several further areas of research.

The first of these echoes and extends Gargiulo's (2017, 2023) call for further investigation into Registration as a bordering technology. This article has demonstrated that the necessity of registration for foreign nationals in many EU states is being leveraged commercially by digital housing platforms. However, the extent to which this plays out in similar ways in contexts which also have a form of Registration, such as Italy, is not known. Further, given the embeddedness of Registration within State and non-State services, the extent to which it is being instrumentalised in the service of revenue-generation by digital platforms outside the residential rental sector remains unclear. This could extend and deepen the existing scholarship around "migration industries" in Berlin beyond those seeking asylum (Bernt et al., 2022), allowing for a fuller picture of the commercial world involved in facilitating mobilities in Europe.

A second direction to explore would be the ways in which informal housing practices in the German context are structured through norms relating to shared housing practices. I have briefly alluded to the ways in which the history of shared living in Germany is intertwined with post-1968 "New Left" movements. Further research might investigate how these historic approaches to the sharing of space has impacted the design of housing platforms in the DACH-L region. A productive line of enquiry might seek to address these issues comparatively, with particular reference to the Anglo-American context. This study has shown how rental platforms are conceived as interrelated by their users in highly situated ways. The degree to which rental housing platforms explicitly position themselves as interconnected entities or "infrastructures" of housing provision across various contexts, and the ways in which this serves specific commercial interests requires further exploration. Further empirical work is needed in order to understand how these connections manifest technically, materially, and socially, generating new housing norms in the German context. Understanding more about how housing platforms are embedded with the governance of mobility are an important step in forming interventions which can equitably address the inequalities generated within secondary housing markets.

Acknowledgments

I would like to thank my supervisors Dr. Susan Moore and Dr. Andrew Harris for their support developing this article. I extend my thanks to the anonymous reviewers for their helpful and constructive comments.

Funding

This research has been supported by an Economic & Social Research Council 1+3 Studentship (grant number ES/P000592/1).

Conflict of Interests

The author declares no conflict of interests.

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About the Author

Leah Aaron is a PhD candidate at the Bartlett School of Planning, University College London. Her current research builds on this article, focusing on the role of the digital and migratory housing trajectories in Germany.