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of peer-to-peer (P2P) renting**

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Beyond informality: The rise of peer-to-peer (P2P) renting

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Abstract

The recent proliferation of peer-to-peer (P2P) renting, commonly associated with the 'sharing economy', is a unique phenomenon developing globally. This chapter focuses on a particular P2P platform, Airbnb, an online market for linking those who have accommodation to rent to potential renters. It is commonly considered as 'informal' or 'illegal' by many different groups because it is not heavily regulated by government unlike hotels and hostels. Our study examines Airbnb from multiple perspectives, including the nature of sharing in the 'sharing economy', the controversies surrounding Airbnb, its spatiotemporal dynamics, and the potential relationship between Airbnb to rapid gentrification in different areas of the city. From this study, we can draw preliminary conclusions that Airbnb is beyond 'informality' *per se* with it leaning more a more decentralised online service. By using London as a case study, our analysis also shows that there the majority of the listings are 'entire home' property that might be associated with areas where there is rapid gentrification. This chapter contributes to the discussion of Airbnb and the sharing economy by providing a preliminary yet comprehensive approach to our understanding of the platform, and its impact on the city.

Keywords: Airbnb, P2P, Sharing Economy, Urban Locations, Gentrification, Informality, London, San Francisco

At the beginning of 1970s, anthropologist Keith Hart published a work titled 'Informal income opportunities and urban employment in Ghana' that soon became one of the scholarly bases for the dualistic idea of separating the formal from the informal (Sindzingre, 2006; Hart, 1973). The International Labour Office (ILO), a permanent secretariat for International Labour Organization, also used the term 'informal' in many of their works such as the 1972 ILO study on Kenya (International-Labour-Office, 1973). But what exactly constitutes 'urban informality'? This dichotomy has been referred to various activities, and these are so heterogeneous that the definition of the term has become somewhat vague. Various studies referred to the informal sector as self-employed entrepreneurs escaping taxation, operating outside the 'formal' sector, lacking government regulation or happening outside the monitoring of financial institutions. It possesses several characteristics – such as hawking in the street, usually as an unregistered practice and having a low barrier to entry (International-Labour-Office, 1973; Moser, 1978).

In the hospitality industry – including accommodation services – it is easy to spot

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the formal sector: there are essentially hotels. The hotel industry can be dated back to the early middle ages, but only in the 1900s did hotels become an industry taking over in urban centres with grandiose buildings catering for the higher income travellers (Levy-Bonvin, 2003). In a way, the 'traditional' hotels that we know nowadays with their mostly uniform rooms are a new invention in the industry. Being an hotelier requires a lengthy bureaucracy process, as there are many laws, registrations and codes to consider. In the UK, for instance, licensing, fire regulations and food hygiene are among the top priorities that have to be followed, along with ensuring that hotels are located according to appropriate zoning laws and following the relevant tax compliance. Hotels are registered and operated following these rules; otherwise, they can be penalized for disregarding them. In the last couple of years, consistent with the advancement of technology, there has been a proliferation of peer-to-peer renting. This refers to activities where producers and consumers utilise the Internet as a platform for exchange, before translation of such transactions in the real world. Notable examples are the short-term vacation rental marketplace platforms – for example, Airbnb, Wimdu, Love Home Swap, Home Away, Roomorama, and Onefinestay. These platforms market a more intensive use of underutilised property in exchange for extra earnings for the the host and authentic local experiences with lower prices for guests. This chapter uses Airbnb (www.airbnb.com), one of the biggest players in the peer-to-peer rental marketplace as a case study to illustrate how this activity is changing the form and function of cities. Compared to hotels, Airbnb is considered experimental and under-regulated due to its unprecedented nature beyond traditional institutions (Dyal-Chand, 2015; Miller, 2016; Hacki and Lighton, 2001). Some studies associate this under-regulation with informality, such as Guttentag (2015) who refers to Airbnb as 'informal tourism sector'. His argument emphasises the very basic component that Airbnb allows ordinary people to rent out their rooms as 'illegal short term rentals' due to the fact that many of those rooms do not meet appropriate zoning codes and deviate from various ordinances (Guttentag, 2015). Slee (2016) devoted an entire chapter in his book to examining how Airbnb affects cities and how it has extended the 'deregulated free market'. Exploring Airbnb as a case study can thus contribute to the discourse of informality.

Before further analysis, it is beneficial to understand the background to Airbnb. Airbnb is a digital platform which aims to connect two domains through a market; these domains are people with spare or underutilised living spaces (known as hosts) and travellers who are looking for alternative accommodations during their travel (guests). As a relatively new digital infrastructure, this type of platform has changed the way we transact and exchange goods. Because the direct transaction happens between two individuals, rather than between a traditional company and a consumer, it is being called 'Peer-to-Peer (P2P)'. As a private entity, Airbnb monetises their role as a network orchestrator by charging hosts a 3% service fee and a 6-9% guest fee for each successful booking (the figures might differ between various cities). Airbnb is commonly associated with the term 'sharing economy', emphasising the notion that our economy has shifted heavily towards the idea that assets' accessibility has become increasingly more important than ownership (Albinsson and Yasanthi Perera, 2012; Heinrichs, 2013; Botsman and Rogers, 2010; McLaren and Agyeman, 2015). 'Sharing' is associated with the concept of P2P renting as an alternative term to invite people to participate globally as the entire success of the concept relies heavily on how large the network is. There needs to be a 'critical mass' in order for P2P to function, meaning that there are enough choices available in the marketplace (Botsman and Rogers, 2010). This ensures the possibility that P2P renting will compete with other types of market such as hotels.

Airbnb has experienced rapid development and growth in just a few years since

its first launch in 2008 by its founders, Joe Gebbia, Brian Chesky, and Nathan Blecharczyk. They started the idea of providing air mattresses for conference participants in San Francisco as a means for alternative lodging. In February 2017, according to the Airbnb website, it has expanded rapidly now with over 3 million listings spread out in more than 65,000 cities in over 191 countries. The platform relies on several important elements: anonymised locations of the property (for security purposes, guests are only able to see the approximate point of Airbnb location with 0-150 m distance from the exact address before successful bookings), pictures of the rooms, descriptions of the place, the host's profile and the reviews (both for the property and the host) to inform guests of the quality of the location and accommodation before making a booking. In order to reduce the safety risk while staying in a stranger's house, the platform provides two ways of rating the system after each successful booking, where hosts can review the behaviour of guests, and where guests can review the property as well as the hosts. Reviews can only be written up to 14 days after a recent trip in the form of verbal digital feedback and a rating system.

How much is shared in the 'sharing economy' Airbnb?

As mentioned before, Airbnb has been closely associated with the 'sharing economy' concept. We need to define what exactly is the 'sharing economy' for sharing concepts can be problematic. Dredge and Gyimothy (2015) found that no fewer than 17 terms are related to this concept including the access economy (Rifkin, 2000), the mesh economy (Gansky, 2010), pseudo-sharing (Belk, 2010), collaborative consumption (Botsman and Rogers, 2010) and the sharing economy itself (Richardson, 2015). Botsman and Rogers (2010) define collaborative consumption (CC) as a system that enables greater efficiency and access to assets through three systems: product service systems (enabling multiple products to be shared, thus maximising utility), redistribution markets (redistributing pre-owned goods), and collaborative lifestyle (sharing and exchanging to create social connectivity). Using four principles of collaborative consumption – trust between strangers, idling capacity, critical mass, and belief in the commons – they believe that CC creates a system that brings us closer to a more sustainable lifestyle (Botsman and Rogers, 2010). Richardson (2015) refers to the concept of a sharing economy, emphasising the open access approach of underutilised resources, motivated by for-profits or non-profits. Belk (2007, 2010, 2014) views sharing as an alternative to gift giving in the Internet society based on coordinated transactions. He coined the term 'pseudo-sharing as a business relationship masquerading as communal sharing' (Belk, 2014). These past studies provide us with a more critical view in examining the sharing concept.

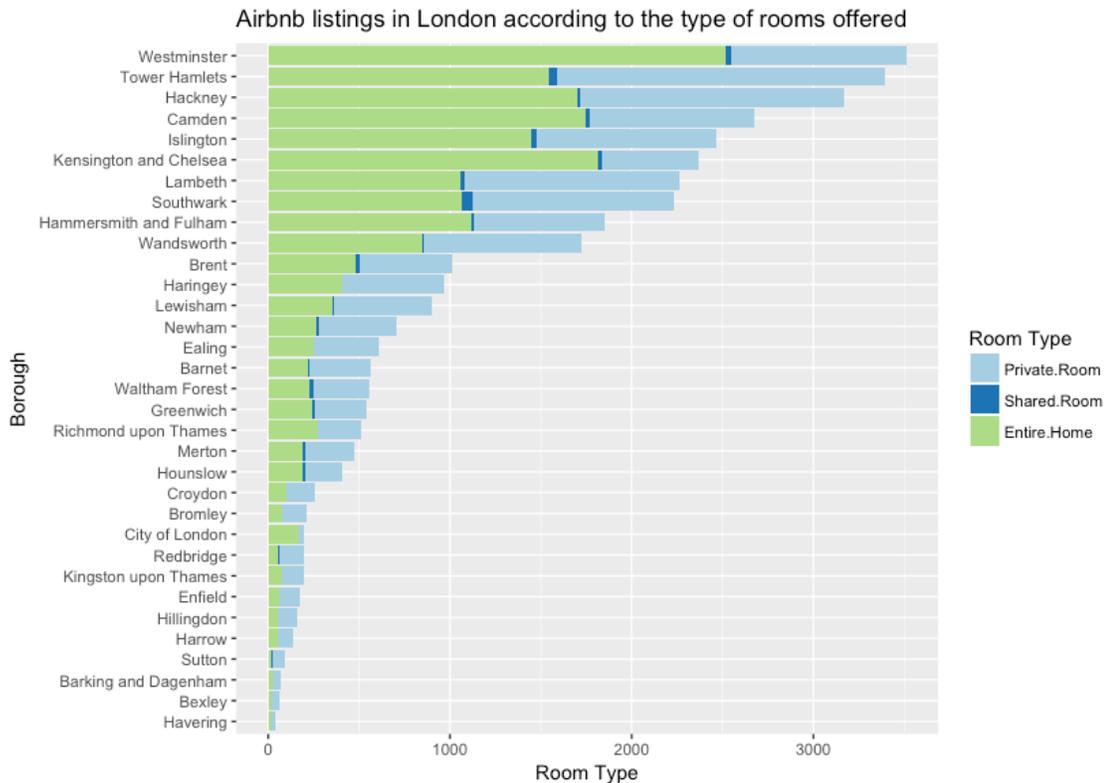


Figure 1: The distribution of 'active' Airbnb listings in Greater London (listings with at least one review) based on the room types. In nearly all the boroughs, almost 50% of the properties being listed are entire homes. Data from Inside Airbnb.

When a guest makes a booking using the Airbnb platform, s/he can choose the property type between: 'Private Room', 'Shared Room' or 'Entire Home'. But if most of the listings are an 'Entire Home' property, how much of the 'sharing economy' Airbnb is actually shared? Figure 1 visualises the number of aggregated Airbnb listings based on the room types in London. We only use listings with reviews as the proxy for active listings, as approximately 70% have had at least one review.³ By plotting the number of listings in each London Borough, and ordering them accordingly, we can immediately recognise an interesting pattern of the commodity types being rented in Airbnb marketplace. From the bar chart, we can see that in nearly every borough, most rooms being rented are 'entire home' properties. Westminster Borough have the most active listings in London, accounting close to 3500 listings, more than 50% of which

³ In London, 70.3% (34,701 out of the total of 49,348 hosts - using October 2016 data for distribution chart based on the room type) and 66.5% (28,398 out of the total of 42,646 - using June 2016 data for Space Time Analysis) of the listings have been booked at least once and have been received feedback from the traveller. The data represents the activities on the Airbnb website since 2008 when it was launched, until 2016. The limitations include the disappearing listings because of actions taken by the hosts that make listings invisible; cancelling, 'snoozing' and deactivating listings. The hosts can cancel their account entirely, thus removing their profile and listings; they can activate a cancelled account by contacting Airbnb directly. Alternatively, hosts can 'snooze' - pause listings and hide them from search results - and (temporarily or permanently) deactivate listings. Airbnb can also deactivate hosts' listings if they feel that the hosts are unable or have a poor response rate (let four consecutive bookings expire, decline consecutive requests constantly and consistently take more than seven days to approve an enquiry).

are entire homes - followed by Tower Hamlets and Hackney, respectively.

The idea of P2P such as Airbnb is to transform how we exchange and take a more decentralised approach. One of the purposes is to expand 'the economic pie for ordinary people' thus providing economic empowerment to those who share their homes.⁴ This has helped a large number of people who benefit from sharing their homes. Airbnb has enabled those with extra spaces to rent them out, thus maximising the utility of the space. The stories of these hosts are displayed on the company website. It ranges from a story of Kimberly in New York City with degenerative disease who can finally afford to pay rent and treatment because of Airbnb - "my husband and I spent countless nights wondering if and when we would lose our home, or if we would have to stop treatment to keep a roof over our heads... Airbnb saved us" as well as enabling Ivan in San Francisco to spend more time pursuing his passion - "hosting on Airbnb definitely allowed me to dedicate a lot more time towards publishing the book than I would not have been able to do otherwise".⁵ Looking back to the analysis in Figure 1, it is worth to ask what is the cost of this rapid development of home sharing, especially to cities?

Controversies surrounding Airbnb

The infiltration of Airbnb into major cities has sparked serious debates. The issues raised mainly concern the effect of Airbnb on the housing market, the regulations surrounding Airbnb and the loss of cities' revenue related to taxation. Airbnb is often blamed on creating 'unscrupulous behaviour within the housing market' (Guttentag, 2015) by removing houses from the market by conversion into short-term rentals thus creating depleted housing stock and increasing price (Farivar, 2016). These are the cases highlighted by the media, such as a front-page article in the New York Times by Benner (2016) titled 'Airbnb in Disputes with New York and San Francisco' along with an image of an older man holding a big red sign saying 'evicted' in the protest against eviction by landlords as we show in Figure 2. The allegation was that the owners converted their units into Airbnb rentals and thus evicted their tenants. There are various similar news stories linking Airbnb with the soaring house prices (Benner, 2016; Farivar, 2016; Truong, 2016; Mclean, 2016). Lee (2016) suggested a targeted restriction towards Airbnb to prevent distortion in the housing market through applying for limited permits, only allowing Airbnb in buildings that meet 'the affordability threshold', limiting the number of days per year as well as enforcing tax to fund enforcement.

Regulation and taxation are other aspects that have created many controversies surrounding Airbnb. When compared to the traditional hotels, hostels, and B&Bs (Bed and breakfast accommodations) as the established players in the accommodation industry, Airbnb lacks comprehensive policies that regulate customers, businesses, and government as key players in the tourism industry. In mid-2016, Airbnb sued the city of San Francisco over the new ordinance that forced Airbnb hosts to register their listings. The city tried to enforce this legally by putting a \$1,000 fine a day for every unregistered host operating via Airbnb platform (Benner, 2016). Just a couple of weeks later on June 26th, Mclean (2016) reported via CNN Money that Airbnb had sued its hometown, San Francisco, in federal court, objecting to the said ordinance that was to go into effect in late July 2016. The article mentioned that Airbnb contended the rule

⁴ <https://www.airbnb.com/citizen>

⁵ <https://www.airbnb.com/stories>

violates the Communication Decency Act's section 230 (protecting interactive Internet service providers from being liable for voluntary actions made by users), the Stored Communications Act (allowing Airbnb not to disclose user contents without subpoena), as well as the First Amendment's freedom of speech provision (McLean, 2016; Farivar, 2016). These kinds of battles on regulations have been happening all over the world wherever Airbnb have set up.



Figure 2: Left: A protest in San Francisco published in *The New York Times* in 2014 allegedly because the landlord converted their units into Airbnb rentals. Source: Justin Sullivan / Getty Images in Benner (2016). Right: Protest in supporting home sharing outside the City Hall in New York in 2015. Source: Beбето Matthews in Sanders (2016).

These problems of regulation and taxation have attracted many professional scholars to study these issues. The reason Airbnb is very popular is that it offers more competitive rates, providing authentic 'local' experience, and the convenience of living in residences, aligned with 'disruptive innovation' theory (Guttentag, 2015; Bower and Christensen, 1996). Airbnb is able to provide lower prices (initially) because it infiltrated the system as an informal market that is not regulated. As a result of waiving the cost of formalisation, the prices offered are more affordable than those in the regulated market (Hernando, 1990). Past studies have suggested that the mean rates and median rates of Airbnb are more competitive than hotels and hostels in the area based on a study of six major cities: Chicago, Montreal, Rio de Janeiro, San Francisco, Sydney, and Venice (Guttentag, 2015). Also, Airbnb is 'assets light', as there is no cost for the intermediaries to build the assets, as Airbnb accentuates the market for access to assets. This is not always the case, as nowadays the popularity of Airbnb has been continually increasing because it has the ability to offer an alternative lodging. Additionally, unlike the incumbent hotels and hostels, Airbnb offers to fulfil what MacCannell (1973) described as the tourists' desire to have authentic experiences, perceptions, and insights by being treated as part of the regional scenery – the 'back-region' – by living with the locals. Furthermore, most properties listed in Airbnb platforms provide the amenities of a home, fully equipped with amenities such as a kitchen and laundry room, making travelling more convenient. Due to these reasons, Airbnb has grown significantly, especially in urban settings. These reasons have made it possible for Airbnb to capture a certain portion of the market and even create new markets for travel.

The explosive growth of Airbnb due to its always-increasing number of participants has made many cities realise its potential benefit, as well as threats that come along with the concept. Cities all over the world have created various

attempts at formulating targeted policy responses to protect housing stocks. Amsterdam implemented 'Amsterdam short stay policy' in agreement with Airbnb in 2014, by putting a 10% cap on the amount of private housing proportion that can be converted into short-stay properties per district. Additionally, apartments with a weekly rent under EUR 710.67 should be available for households with lower incomes.⁶ Further analysis related to these types of policies is further examined in Table 1.

Table 1: Regulatory responses to Airbnb in various cities

Cities	Regulations	Details
San Francisco	Residential Unit Conversion Ordinance (Chapter 41.A) regulating the short-term rental of residential units (enacted on 1 February, 2015 legalizing short term rentals).	Buildings should be owned or rented by permanent residents of San Francisco who reside in the units at least 275 days/year. 90 days rule (not applied for hosted rentals). Register and obtain permit to the Office of Short Term Rental and pay \$50 fee good for two years. Rent Control Laws (not more than what the host is paying to the current landlord). Pay Hotel Taxes (14%) and obtain business registration certificates.
London	Deregulation Act 2015	Act amending the outdated 1973 Greater London Council laws 'requiring Londoners to get planning permission for rentals of fewer than 90 nights, or face a fine of up to £20,000 for each unlawful rental' making it legal to list and rent short term rental properties.
Amsterdam	Amsterdam Short Stay Policy	Rental of non-subsidised housing for periods from seven nights to six months. Owner of property must secure a permit for short stay rentals and pay a fee. Local city districts put a cap of 10% of total private housing on who can be granted a permit to ensure sufficient housing supply for residences.
Berlin	<i>Zweckentfremdungsverbot</i>	New regulation passed in 2014 with a

⁶ <http://www.iamsterdam.com/en/local/live/housing/rental-property/shortstay>

Cities	Regulations	Details
		two year transition period (began on 30 April) banning short-term rentals without explicit permission from the Berlin Senate. Fines of up to €100,000 for offenders.
Seoul	Banned	Existing regulation ruled against unregistered home sharing due to tax and health concerns.
New York	Senate Bill S6340A prohibiting advertising the use of dwelling units in a class A multiple dwelling	Rentals that last fewer than 30 days are prohibited if residents are not present.

Kaplan and Nadler (2015) suggest a collaborative approach that enables home sharing without releasing the hosts from a fair share of tax. Responding to these approaches adopted by cities, Airbnb has tried to address the issue of taxation and housing laws by conducting a more open and collaborative approach as well. Airbnb has included the explanation on their website to ensure that the hosts acknowledge that they 'need to understand how the laws work...these laws are often part of a city's zoning or administrative codes' and that every host is responsible for the applicable taxes (Airbnb Terms of Service). Also, in December 2016, Airbnb launched a 'policy tool chest as governments' resource' to craft progressive, fair rules for home sharing' offering four sets of policy options including 'tax collection, good neighbours, accountability, transparency and privacy'.⁷ The danger of over-regulating P2P or sharing ventures is that they have the possibility of stifling innovation. The Airbnb market and demand are very fluid, experimental and highly adaptable.

The spatiotemporal dynamics of Airbnb

The location and density of Airbnb hosts evolves throughout both space and time, and therefore it is useful to examine the platform spatiotemporally. Using publicly available data, we visualised the Airbnb locations in London using their spatial and temporal attributes.⁸ We used space-time analysis and aggregated the active Airbnb listings data into the 500 square metre space-time bins throughout the three-dimensional cube with regard to their positions in space (x and y-axes) as well as time (the vertical t-axis). Each bin was analysed using the Mann-Kendall Statistic to explain the trends and their dynamics. The purpose of this analysis is to analyse the dynamics of Airbnb evolution based on their age distribution (when they became available for the first time

⁷ <https://www.airbnb.com/introducing-the-airbnb-policy-tool-chest/>

⁸ The data extracted from the website 'Inside Airbnb: Adding Data to the Debate' (insideairbnb.com) by Murray Cox and his team, who analysed, cleansed, and aggregated data from publicly available information on the official Airbnb website. The detailed methodology for data collection and cleaning can be found on the website. The data is protected under a Creative Commons CC0 1.0 Universal (CC0 1.0) 'Public Domain Dedication' license. It contains detailed listing information including the room type, location, price, facilities, availability, and other essential information such as the hosts' detailed profile.

as hosts) in each city. In areas with significant agglomerations of Airbnb listings that show statistically significant increasing (or decreasing) trends, further analysis was conducted to explain the characteristic of the areas based on their profiles. The space-time analysis visualises as well as conceptualises space-time data that otherwise is not presentable in their original form. It provides more possibilities for understanding the spatial relationships and geographic dynamics of this phenomena (Nakaya, 2013).⁹

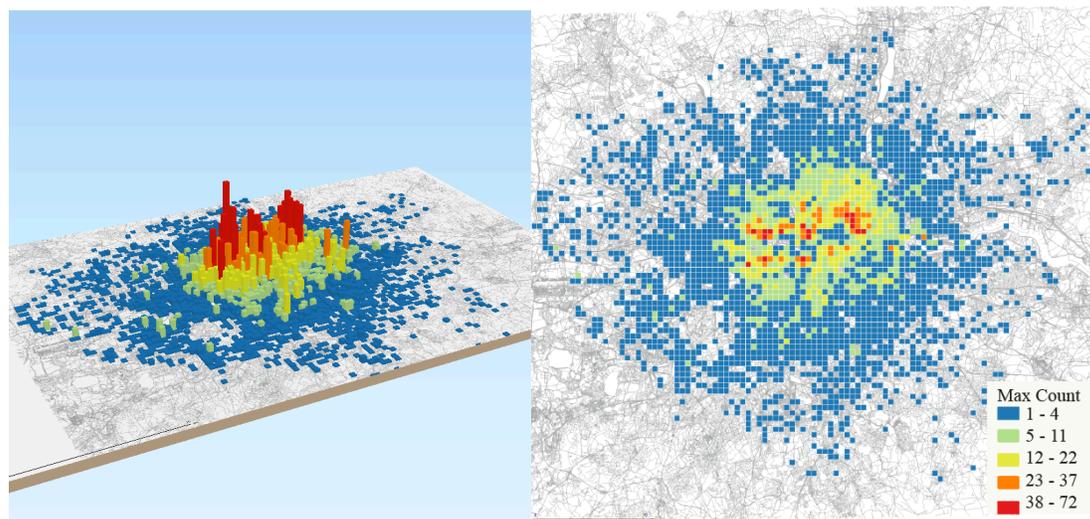


Figure 3: Cumulative Airbnb counts in London using 3D and 2D perspectives showing centre-periphery patterns.

Space Time Cube bins were created according to the given 6 months parameter window.¹⁰ Each bin represents the cube with its spatiotemporal information from 2008 until 2016. Airbnb experiences overall consecutively increasing trends in London shown by the positive Mann-Kendall trend statistic value. The basic descriptive statistic of each bin using maximum cumulative counts of Airbnb listings across the time and space shows a centre-periphery pattern. The Airbnb listings in London are agglomerated in the city centre areas where there are diverse urban functions as shown in Figure 3. This is logical considering travellers would want to stay where there is easy access to transportation, amenities, tourism areas, etc. Unlike other hospitality industries, Airbnb listings also cover residential areas (albeit the number is less significant).

Looking at the finer detail, we can see that the pattern of Airbnb listings in central London areas shows a complex spatiotemporal dynamics. Instead of clustering in only one area, the highest spatiotemporal counts are divided into three main areas. The next section explores and analyses further which areas in London that have the highest spatiotemporal counts and the characteristic of those areas.

⁹ We used spatiotemporal analysis as our methodology in presenting the changing patterns of Airbnb in London. We performed the analysis in the Space Time Cube (STC) available in ArcGIS using Airbnb spatial data, containing the approximate latitude and longitude, which was combined with the 'first review' temporal attribute. Any data with no reviews were excluded from the analysis. Firstly, the XY Data of the listings were transformed into vector data and projected accordingly to accurately provide distance measurements. The output summarised the listing points into NetCDF (Network Common Data Form), the independent data formats for array-oriented scientific data, and then aggregated them into space-time bins.

¹⁰ There are 14 time-steps, with a total of 8,549 bins.

Does Airbnb linked to the areas with rapid gentrification?

From Figure 3 we can immediately see that some areas in each bin have more active listings compared to other bins (shown by the red colour in the figure). If we zoom into see the six highest counts, we can further examine if Airbnb tends to thrive in areas with a certain characteristic. Figure 4 shows that five out of six areas with the highest cumulative Airbnb count across their spatiotemporal attributes are located in Hackney and Tower Hamlets areas.

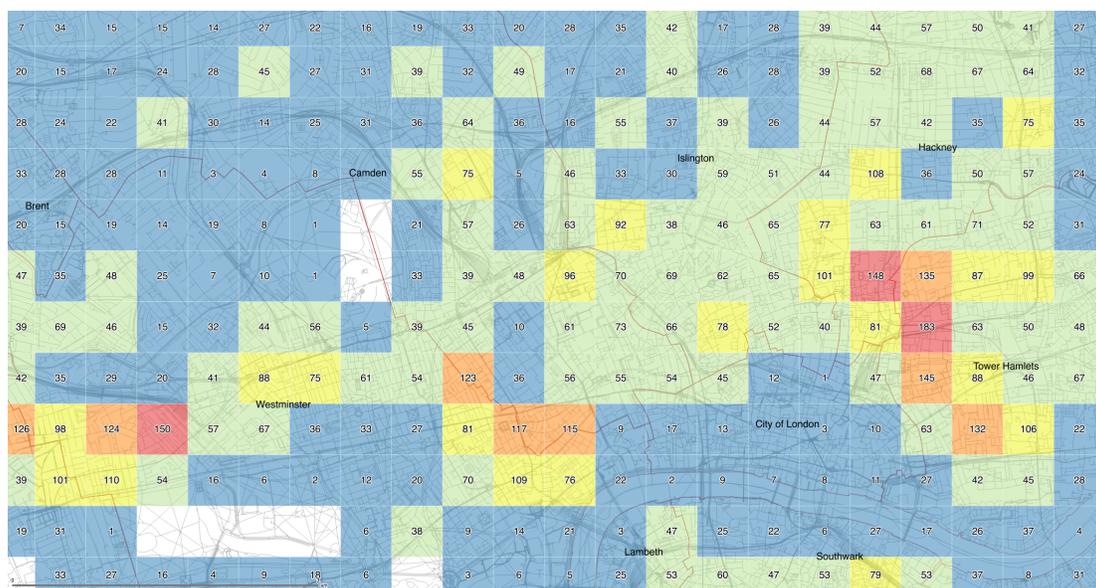


Figure 4: Areas in London with the highest cumulative Airbnb counts in each 500m x 500m spatiotemporal bins. Five out of six areas with highest cumulative counts are located in Hackney and Tower Hamlets, areas with rapid gentrification

Hackney and Tower Hamlets have been long described as areas commonly associated with rapid gentrification (Robson et al., 2008). The term itself is first coined by an urban sociologist Ruth Glass in her book 'Aspects of Change' published in 1964, and it is often closely associated with the class shifts which happened due to the process of redevelopment, regeneration or urban revitalisation (Glass, 1964). Later studies introduce the term 'tourism gentrification', commonly used to describe a condition when a neighbourhood transforms into a relatively more affluent condition due to the proliferation of tourism activities (Gotham, 2005) and this phenomenon is often blamed for displacing lower-income families (Slater, 2009).

Interestingly, over the last five years, Tower Hamlets and Hackney areas have been experiencing rapid changes. According to a comparison between the Index of Multiple Deprivation 2010 and 2015, the two areas are among top three authorities that have been experiencing the largest point decrease (Hackney with more than a 20% drop and Tower Hamlets with more than a 15% drop).¹¹ Both Hackney and Tower

¹¹ According to The English Indices of Deprivation from the Department for Communities and Local Government and calculated using change in the proportion of neighbourhoods in the most deprived deciles.

Hamlets are no longer among the top 20 most deprived areas in the UK and we query whether or not that this might be related to Airbnb? Further quantitative study needs to be conducted to answer this problem.

Increased housing prices due to a depleting stock has been a major concern among the Airbnb critics. As research about Airbnb keeps expanding, so does the research related to this issue. Lee (2016) stated in his study that Airbnb has exacerbated the problem of an affordable housing crisis in Los Angeles. The study shows that Airbnb listings are concentrated in the most expensive part of the city and is 'correlated with gentrification in adjacent neighbourhoods' (Lee, 2016). Gutierrez et al. (2016) and Gant (2016) studied the progressive expansion of Airbnb in Barcelona, and stated that even though problems of holiday rentals in Barcelona have been evident for a several years, Airbnb has extended the gentrification process.

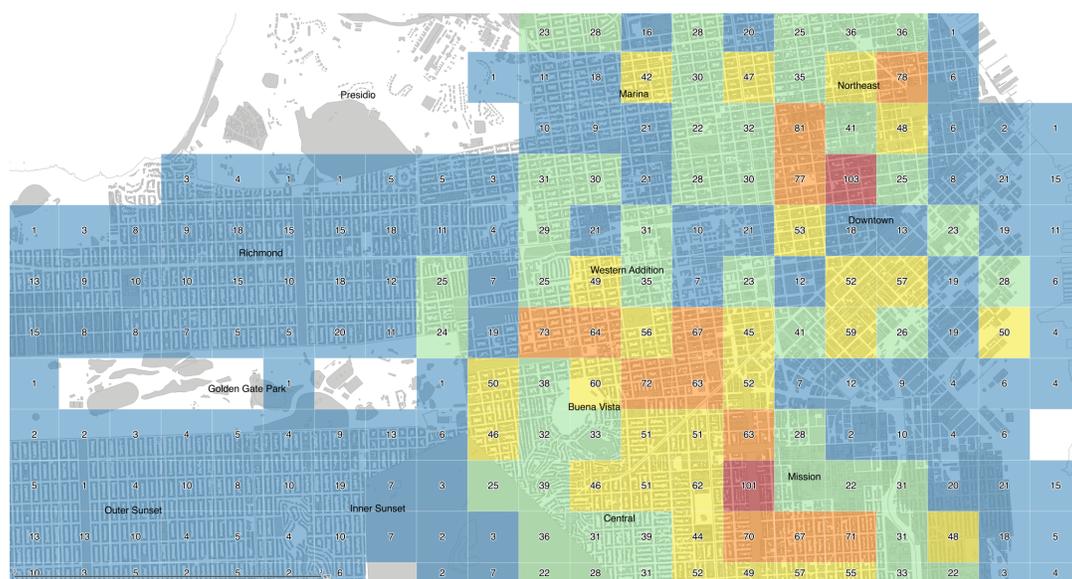


Figure 5: Areas in San Francisco with the highest cumulative Airbnb counts in each 500m x 500m spatiotemporal bin including Mission, Downtown and Northeast areas.

From these tendencies, we further our exploration by examining San Francisco, the home – town of Airbnb using the same spatiotemporal method, the Space Time Cube. In San Francisco, the spatial dynamics are more complex along the North East and South East Part of the city. The functions of those areas, according to San Francisco zoning, are commercial and mixed residential-commercial districts. Figure 5 shows that Mission in San Francisco, which has the second highest cumulative counts of the spatiotemporal bins, is an area that seems to be very well known as neighbourhood where 'gentrification is faster and more drastic' than elsewhere.¹² We speculate is this the trend in most cities? Given what we have observed London, and it might be also the case in San Francisco, further study globally needs to be implemented.

¹² <http://www.nytimes.com/2015/05/23/us/high-rents-elbow-latinos-from-san-franciscos-mission-district.html>

Conclusion

This chapter has explored Airbnb from various perspectives and provided a brief spatial and temporal analysis of Airbnb in two specific cities: London and San Francisco. We can draw several findings from the previous analysis.

First, it is not easy to categorise Airbnb as being formal or informal, although many studies have considered it to be 'informal' or even 'illegal'. Even though Airbnb shows some characteristics as an informal concept, such as 'escaping taxation', with alternatively low barriers to entry, Airbnb has been gradually formalised due to many movements across the globe originating from the controls and regulations that city government has begun to put in place. Even before these moves, hosts and guests who use Airbnb platform have bounded by many of institutional policies. Thus categorising Airbnb as informal is a matter of semantics, as it is currently located in the 'grey' area between formal and informal. Second, the majority of Airbnb listings (for example in London) is 'entire home' property. This has the danger of exacerbating the depleting housing stocks in major cities. From the spatiotemporal analysis, Airbnb tends to be located in or adjacent to areas with rapid gentrification. Further study needs to be conducted to further analyse these findings.

The Airbnb market in terms of demand by travellers and the supply by hosts is very fluid, experimental and highly adaptive. Much remains to be researched, especially using comparative studies, as Airbnb cases are unique in different cities. This study is preliminary in nature and seeks to provide a basic understanding for further advancing the study of Airbnb as a global as well as growing phenomenon. This study suggests that a firm quantitative grounding concerning the spatial dynamics of Airbnb provides a useful focus on the extent to which such disruptive economies are distorting the process of regeneration, gentrification, and segregation in large cities where Airbnb has taken hold.

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