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Integrating Retail into an Urban Data Platform from a Stakeholder Perspective: Network Approaches in Leipzig (Germany)

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Abstract: Growth rates in e-commerce, changing consumer behaviors, and COVID-19 have all put pressure on local retailers worldwide, threatening the resilience of city centers. Local online platforms (LOPs) have been considered as a solution to help local retailers increase their visibility and survive on the market. However, most platforms fail to attract a significant number of stakeholders. Simultaneously, digital platform solutions with more holistic urban perspectives, such as urban data platforms (UDPs), have emerged. However, a question remains: how can the integration of retail data (e.g., product availabilities) into a UDP succeed? Therefore, in this paper, we explore stakeholder-oriented networking processes to integrate local retail data into a UDP in Leipzig, Germany. Leipzig has increased its population by 26% since 2000, but presents the highest retail vacancy rate, compared to other major German cities. To investigate the networking process in Leipzig, we conduct a social network analysis which combines qualitative interviews, mapping, and ethnographic research. We interview ten stakeholders and uncover conflicts within the networking process: First, all stakeholders have different understandings of UDPs and how to integrate local retail data; second, the interviewees acknowledge the importance of, but none of them feel responsible for, initiating or managing the process; and third, the city administration has shown diverging interest, in terms of taking on more responsibility.

Keywords: retail; e-commerce; smart city; urban data platform; stakeholder networks; urban planning; network analysis; Leipzig



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1. Introduction

The past decade has been challenging for local retailers and has threatened the resilience of city centers [1]. In particular, smaller owner-managed shops have found it difficult to cope with the overlapping processes of digitalization [2], the rising dominance of chain stores [3] and upgrading processes such as commercial gentrification [4]. Notably, the current pandemic has particularly accelerated digitalization [5–7], and a general intensification of already-existing problems and challenges has been observed due to COVID-19 [8]. The retail sector has been hit hard during the pandemic [9]: local shops have been forced to close temporarily due to lock-down protocols or access restrictions for the unvaccinated [10,11]. Hence, it comes as no surprise that, around the globe, different approaches to cope with the crisis have arisen [12], as the resilience of local retailers is limited [13]. One feasible and highly discussed option is local online platforms (LOPs) [14–16]. LOPs mainly link local retailers and logistics companies by means of digital platforms, in order to ensure online sales for local retailers and delivery to customers [14]. Multiple obstacles exist when it comes to implementing such a platform. Their production and maintenance are cost- and time-consuming, which is why few retailers have chosen to participate. This, in turn, means that few customers have taken notice of the platforms [14].

At the same time, holistic urban solutions are developing alongside pure digital solutions for private data integration. Urban solutions aim to integrate various stakeholders into a digital platform, in order to ensure the digital resilience of cities. These solutions include urban data platforms (UDPs), as new “governance models for smart cities” [17]. The challenge is to map private and public data together on these platforms, as well as enabling the integration of both databases. However, at present, LOP and UDP are not exactly competing platforms, as the utilization of a UDP is not initially oriented to retail. UDPs were first used to map urban districts; for example, to monitor traffic volumes and air pollution in cities [18]. However, retail can still play a role in UDPs. With a UDP, retailers might gain more visibility than with a LOP, as the city administration is able to spread information more widely and UDPs are usually considered more trustworthy to a higher number of people than the private firms who initiate a LOP with the primary intent of earning money from it (most stakeholders that we interviewed wanted the city administration to take on more responsibility concerning retail development).

While both digital solutions were in the pipeline in Leipzig, the research project SURTRADE (2017–2020), funded by the German Federal Ministry of Education and Research, aimed to initiate a networking process in the city center of Leipzig, Germany. This network sought to bring together local retailers, as well as public stakeholders, associations, and other interest groups. The goal was to develop a joint digital solution for the city and the retail sector that would make local retail—and, thus, the city center of Leipzig—more resilient to external influences.

Leipzig is a compelling case to study. Embedded in the East German context, Leipzig was confronted with market economy overnight and faced urban shrinkage, de-industrialization, and suburbanization during the first years after the German reunification [19]. Paradoxically, the total sales area tripled from 1989 (160,000 square meters) until 1996 (507,000 square meters), and even quintupled until 2019 (889,000 square meters). Simultaneously, the number of retail businesses has decreased by 23% from 1999 to 2019 [20], representing a general trend towards larger shops. This growth in retail was accompanied by urban regeneration processes from the year 2000 onwards [21]. From this moment on, demographic growth rates accelerated. Over the last ten years, Leipzig’s population has grown from approximately 500,000 inhabitants (2010) to more than 600,000 inhabitants (2020) [22], making Leipzig Germany’s fastest growing city [23]. Within this setting of demographic and economic growth, it is surprising that the retail vacancy rate in the city center is more than 20%—the highest value among the nine largest German cities [24]. Consequently, there is a striking need for action, as the development indicated above permanently challenges the existing retail structure in Leipzig. Here, smaller and owner-managed retail stores are still of great importance and account for the peculiarity of Leipzig [20,25].

As researchers within the SURTRADE research project—and, therefore, stakeholders in the process—we have a complex position which requires a particular examination of the subject matter. On the one hand, our task was to design a stakeholder network that should help to integrate local retail data into a UDP and analyze the requirements to do so. On the other hand, we must critically question to what extent we, in our position of influencing the networking process through the research project, are able to analyze and evaluate this process well. Therefore, we chose a social network analysis approach, which combines qualitative interviews, mapping, and ethnographic research. This not only helps us to understand the emerging network as a social production, but also to reflect on our position as researchers and stakeholders within the process. We analyze the textual and visual outcomes of ten interviews with accompanying net maps [26], concerning the stakeholder-oriented networking process to integrate retail data into the UDP. This serves as the basis for the social network analysis. The remainder of this paper is structured as follows: Section 2 presents the theoretical background of our research, drawing from network theory. Section 3 details the material and methods. Section 4 describes our findings, and Section 5 provides our discussion.

2. Digitalization Provokes Network Dynamics in Space and Place

Urban space—and space, in general—“is a social product” [27]. Of course, Lefebvre [27] could not have foreseen the extent of today’s digitalization back then. Nevertheless, he also considered that “social space is constructed neither by a collection of things or an aggregate of (sensory) data, nor by a void packed like a parcel with various contents, and that it is irreducible to a ‘form’ imposed upon phenomena, upon things, upon physical materiality” [27]. In other words, social spaces vary according to the people who produce the respective spaces and to the materials or data people use, modify, and connect. Thus, the production of spatial and electronic networks within spaces cannot be understood isolated from the economic and socio-spatial dynamics that prevail in a society, as the example of Leipzig shows [28].

Going further, Graham [29] has stated that “the social production of electronic networks and ‘spaces’ co-evolves with the production of material spaces and places, within the same broad societal trends and social processes”. This means that electronic (social) networks form a ‘new geography’ [30], which co-exists with the physical space and its economic and socio-spatial dynamics. One example is the widespread enabling of ‘click and collect’ in the era of pandemic interdependencies. Customers are able to buy products online from the store and pick it up from the store’s door. This indicates that there is still a specific connection in retail between physical space and cyberspace. Both spaces coexist, “(. . .) providing a new layer of virtual sites superimposed over geographic spaces” [31]. Like Kitchin [31], and in contrast to Batty [30], we do not mean that cyberspace replaces physical space. Nonetheless, the pandemic has boosted e-commerce, which is likely to remain permanent, to some extent [9,32]. However, the COVID-19 pandemic has also proven that people hold on to both worlds—that is, physical space and cyberspace—as the change in retail varies depending on product range and retail sector. Groceries, for example, were often bought locally, even during the pandemic. Together with hospitality, apparel, and leisure, these sectors “appear to strengthen within the re-emergent city” [13]. Even before the pandemic, Massey [33] predicted the lasting importance of physical space with the simultaneously increasing relevance of cyberspace: “While ‘the end of cities’ [29] through technology-led dispersal is confidently predicted by cyber-futurists, cities are growing as never before”. Thus, cyberspace adds important possibilities to connect and re-connect people and influences physical space. Graham [29] and Wiig Aslesen et al. [34] have referred to this development as the recombination of physical and cyberspace and emphasized their relational connection.

Thinking about the relational connection between physical space and cyberspace, technological and social networks need to not only be considered, but also differentiated [35]. Technological networks are often described using actor–network theory (ANT) [36–39]. ANT “(. . .) aims at describing the very nature of societies. However, to do so it does not limit itself to human individual actors but extends the word actor—or actant—to non-human, non-individual entities. (. . .) It does not wish to add social networks to social theory, but to rebuild social theory out of networks” [38]. Referring to retail, an online shop of a stationary retailer can be an actant or entity that has been socially produced, connecting the retailer and customer, and relating to the physical space. However, the online shop has no individual social networks or relationships to other actants. For this reason, this perspective is less relevant to this study. Rather, we focus on social networks as we intend to analyze stakeholder-oriented networking processes.

2.1. Whose Responsibility? Social Networks and Digital Urban Planning

When exploring social networks, we refer to individuals and their relational connection to other individuals in both physical space and cyberspace. For example, Massey [33] has outlined how cyberspace promotes the development of communities through network processes: “Communities, in the sense of networks of communication of common interest, of similarity along selected dimensions, can easily be established at a distance; non-contiguous time-spaces of commonality (. . .)”. Despite that, a “connection to the

internet does not inherently make a community, nor does it lead to any necessary exchanges of information, meaning and sense-making at all" [40]. In their opinion, this lack refers to inequalities concerning information and access to technologies within a society [41]. Already in the 1990s, Graham and Aurigi [40] had pointed out that "access to networks (. . .) does not necessarily bring advantages or power." The authors thereby give insights into power relations connected with technologies within today's society [42]. "Just as cyberspace leads to a concentration of power, so it can also facilitate resistance by enabling small groups to access large audiences" [43]. Thinking of owner-managed retailers, they can gain visibility through cyberspace, in addition to the solely local physical space. In contrast, however, the unequal power relations of global retail enterprises and local owner-managed retailers are obvious, especially in cyberspace. Global players such as Amazon or eBay more than ever concentrate their internet power, but also contribute to the further development of internet presences of local retailers and are, therefore, relevant for social networks (eBay local; Amazon store, Berlin, Germany).

Facing these power inequalities, Graham and Aurigi [40] have recommended purposeful governance of virtual processes in cities. This goes along with the idea that localities can influence power relations in cyberspace as well as physical space. "Virtual interactions in virtual cities need to be shaped, as far as possible, to feedback positively on to the development of face-to-face, direct interactions embedded in the physical spaces and cultures of real cities" [40]. The positive development of city cultures includes small local retail as one of the cultural facets of European city centers [44,45]. However, digitalization has developed rapidly in recent years, which has had impacts in various areas and, thus, also on their digital and physical governance. "Networked ICT (information and communication technologies) is increasingly seen as an opportunity for more sustainable urban development" [46,47]. Smart city approaches, therefore, develop integrated solutions that include and network diverse fields of application [46,48,49]. Helping to integrate coherent and legible approaches in cities, institutions such as the EU or the National Urban Development Policy in Germany have developed informal guidelines and strategy papers towards digitalization and governance in smart cities, such as the "Smart City Charter" [50], the "New Leipzig Charter" [51], and "The Urban Resilience Memorandum" [52]. All guidelines name urban planning as one responsible stakeholder to govern, arrange, and organize digital activities that refer to the respective localities [50–52].

Urban planning, as a local institution, constitutes of stakeholder networks. Fuhse [53] has addressed the roles and institutions within the framework of social network of meaning and communication. He argues that "roles consist of expectations about the relational behavior in social positions towards another position" [53]. Concerning digitalization, the role of urban planning seems to concentrate on the involvement of diverse stakeholders, the promotion of creative ideas, and the organization of knowledge exchange [54]. Ferreri and Sanyal [55] have specifically pointed to the responsibility of urban planning in mediating between stakeholders with opposing interests. Fuhse [53], furthermore, has stated that "roles and institutions follow cultural models," which suggests that the role of urban planning can be understood differently according to the economic and socio-spatial context. This is also reflected in the different interpretations and applications of smart city approaches around the world, each with different responsible stakeholders [46]. "Roles and positions are (furthermore) part of the manifest structure of meaning in a social context. They are represented with symbols like the name of a position" [53]. Thus, the term 'planning' already gives the impression that an institution carries a predominant role and has an overview of all relevant structures. The pre-condition for fulfilling their role expectation is to be embedded within social relationships of a network [53]. Communication within the network is key to verifying or changing the respective roles [53].

2.2. Urban Data Platforms—Diverse Stakeholder Networking Processes in Smart Cities

The major role of urban planning is most likely the formation of networks between different fields of urban development, not least to promote the development of a smart

city [52]. Urban planning intends to bring together public and private services relating to the economy, mobility and transport, housing, retail, and health care [51]. These fields benefit from information gained and transferred from the other fields. Graham and Aurigi [40] have predicted a stronger exchange of diverse local stakeholders concerning those fields, as a result of cyberspace. “The growth of virtual cities and the general proliferation of locally-planned electronic spaces, may, in the longer term, prefigure a broader movement based around the ‘urban planning’ of cyberspace, based on creative local partnerships between the public, private and community sectors” [40]. The development of urban data platforms (UDPs) as infrastructure for the so-called smart urbanism reflects these predictions. Smart urbanism has been defined as “a loosely connected set of confluences between data, digital technologies, and urban sites and processes” [56]. Scholars have focused on different aspects of these confluences; for instance, data [57] or urban sites [58–60]. There are, of course, divergences in this critical scholarship, notably concerning how the politics of smart urbanism should be conceptualized: should it be conceived as a Foucauldian regime of “governing through code” [61] or, rather, as a broader Latourian cosmo-politics involving different political “moments” [62]? To what extent is discourse central in the rolling-out of smart city policies [63,64]? However, beyond this diversity of foci and approaches, these studies acknowledge the “centrality of data-driven processes of urban and social change in any understanding or analysis of smart urbanism” [65].

The platform concept within smart urbanism emerged from economic and business studies, mainly between the years 2008 and 2018 [66]. “In business studies, (digital) platforms have primarily been perceived as ecosystems that encompass a group of interdependent stakeholders that jointly develop a set of complementary assets” [67–70]. According to the authors, there exists an interdependence between the stakeholders. At the same time, this generates added value for every platform stakeholder. Grabher and van Tuijl [71] and Rochet and Tirole [72] have described how these diverse stakeholders connect on the platform. “In economics, platforms are primarily conceptualized as multisided markets” [72]. “Multisided markets are anything but novel, but in fact designate (an) interface configuration (. . .)” [71]. Typical stakeholders on such a platform would be “customers, advertisers, service providers, producers, suppliers, and even physical objects [referring to both Social- and to Actor-Network-Theory]. (. . .) These platforms also come with a series of tools that enable their users to build their own products, services, and marketplaces” [73]. “Crucially, the platform does not own the services, but only the underlying network infrastructure and the system architecture that controls it, which allows rapid deployment and “viral” network growth at low marginal costs” [74]. However, even if operators cannot control the content, they can control access to it. All the authors cited here refer to a “powerful form” of smart urbanism [65], which is called platform urbanism. Platform urbanism can be described as a collection of technologies that organize as a network on a common basis. “On a general level, platform urbanism refers to the ways in which digital platforms (. . .) reshape the economies, politics, infrastructures, and social lives of cities. Software-mediated social interactions and commercial transactions are here at center stage” [65]. In contrast to smart urbanism, platform urbanism is mainly more individual- than society-oriented, uses different materials (e.g., Uber cars), and is engaged in the daily emotional life of people, as well as being more profit-oriented [75–77].

From an urban perspective, “digital platforms (are) as both a concrete and important factor in the transformation of urban working and living conditions, as well as a radical expression of broader societal changes. These include the flexibilization of labor, the ‘logisticization’ of production and everyday life, and the data-driven and increasingly automated management of work and urban life” [78]. However, Graham [79] has demonstrated the difficulty of organizing such an extensive platform in urban space, which should connect a diverse range of stakeholders, thus complicating the development of interface configurations. “It may seem as if digital platforms represent an inevitable urban future of capitalism stripped down to its essentials. Platforms in the urban environment are fundamentally reshaping urban geographies while being apparently too big to control, too new to regulate,

and too innovative to stifle” [79]. “It is also interesting to note that recent activities by platform companies where they function as smart city entrepreneurs or planning advisors—such as Google’s Sidewalk Labs in Toronto or Facebook, Twitter and others in the Seattle’s Innovation Advisory Council—tend to blur the boundaries between smart urbanism and platform urbanism” [65].

In this context, UDPs (urban data platforms) can be understood as one type of smart city initiative by city governments, in order to implement data-driven services to offer, exchange, and publish open data, together with enterprises, organizations, and society. “The implementation of a UDP results (or is embedded) in a specifically digital form of the (re)production of urban space,” called a Smart City or Digital Twin; for example, the common project of the cities Hamburg, Leipzig, and Munich named Connected Urban Twins—Urban Data Platforms and Digital Twins for Integrated Urban Development (CUT). “A completely new economic and socio-spatial dynamic is emerging that needs to be explored” [80]. UDPs cannot be clearly categorized and likely contain aspects of both smart and platform urbanism, with the related difficulties, and the aspect of how to network diverse stakeholders on a UDP has not yet been analyzed. “(...) Research concerning retail and space as well as economic geography offer many potential approaches” to analyze these aspects [80].

Against this background, we analyze the stakeholder-oriented networking process regarding the requirements to integrate private retail data into a publicly organized UDP in Leipzig. This contributes to the research desiderata of (digital) network theory and smart urbanism, with respect to concrete practice-oriented instruments.

3. Materials and Methods

Our study draws from three different methodological approaches—network analysis, qualitative interviews, and ethnography—which we regard as complementary. From an operational perspective, we conducted a qualitative network analysis. We understand a stakeholder network as “a specific set of linkages among a defined set of [stakeholders]” [81]. Hence, social network analysis allows us to explore the social structures between these stakeholders [82]. There are quantitative and qualitative approaches within social network research [83]; we rely on the latter type. As we aim to explore an emerging stakeholder network in this study, this method will help us to investigate the importance, processes, and perceptions within the network [84]. We want to know which stakeholders are important when integrating retail data into a UDP, and how relevant stakeholders should organize the integration process within a common network.

Our network analysis consists of qualitative interviews, conducted with each stakeholder. We chose an ego-centered approach, which implies that the data were “collected from a sample of stakeholders (egos) reporting on the ties with and between other people (alters)” [85]. Consequently, the inter-personal network of the stakeholders was the focus of each interview [86].

The interviews were semi-structured [87,88], which means that we made use of guidelines to help organize the conversation. We used a mix of open and semi-open questions, which allowed us to focus on the research question (How should the stakeholder network be designed to integrate retail data into an urban data platform in Leipzig?). Apart from that, semi-structured interviews also provide enough space for the interviewees to put their own focus on certain aspects [89]. This is important, considering the explorative character of our investigation. In general, we started by addressing each topic within the interviews with a more general question at the beginning, such as their working field, with the aim of stimulating the conversation. After that, the interviewer was prepared to dig deeper by means of follow-up questions [90].

With respect to the guidelines, we proposed a two-step procedure. There was a difference between the first interview and the following nine interviews (see Table 1), in that the first interview served as starting point for the network analysis. As the interviewee was both the initiator of the research project SURTRADE and has contributed considerably

to establishing the network, this interview was carried out to identify the most relevant stakeholders in the network. There were two sections: first, we asked questions that aimed to generate names [91] (e.g., “Who did you have contact with while conducting the research project SURTRADE?”). Secondly, we used questions that helped to interpret the positions of stakeholders (e.g., “How often did you contact each stakeholder? What was their role in the process?”). This indicates, once again, the importance of the SURTRADE research project in the networking process. It also reveals that we, as researchers in the field of urban development, have a special focus on retail in the city center. However, due to the interdisciplinary nature of the research project, the requirements from an urban perspective were always aligned with our project partners in the retail, logistics, and IT sectors.

Table 1. Interviewees and functions.

No.	Institution/Association	Abbreviation ¹	Function of the Interviewee
I1	University of Leipzig	ULE	Project initiator SURTRADE (research project)
I2	City of Leipzig—Urban Planning Department	C-PLAN	Representative for retail
I3	City of Leipzig—Agency of Digitalization	C-DIG	Chief officer
I4	City of Leipzig—Office of Geoinformation and Land Management	C-GEO	Chief officer and staff
I5	City of Leipzig—Economic Development Office	C-ECON	Staff
I6	LTM GmbH (Leipzig Tourism and Marketing)	A-TOURI	Staff (2 persons)
I7	Chamber of Industry and Commerce Leipzig (IHK)	A-RETL	Staff (2 persons)
I8	City Marketing Association	A-MARK	Representative
I9	Trade Association of Saxony	A-RETL2	Representative
I10	Smartplatz GmbH (enterprise)	COMP	Sales Manager

¹ The abbreviation “A” stands for Association; “C” stands for City.

The following nine interviews had different structures but were comparable to each other. We conducted interviews with different stakeholders from the city administration as part of urban planning (I2–I5 in Table 1). Additionally, we interviewed associations, which represent different perspectives in the field of retail, tourism, and city marketing (I6–I9). The last interview (I10) was carried out with a representative of an external enterprise that offers platform solutions in the field of retail and tourism. The enterprise intensified the discussion about establishing a LOP in Leipzig and sought contact with both the city and us. It stands out that this was the only interview that was not conducted on our initiative, but on the initiative of the company itself. The majority of interviews were conducted with one interviewee at a time, although interviews I4, I6, and I7 each involved two interviewees. In the first part of the interviews, we asked the interviewees to describe their own position and network (e.g., “In the field of retail development, who are your most important contacts?”). The emphasis of the second part was put on retail data and the UDP. The questions were related to the stakeholder-oriented networking process and data integration requirements (e.g., “Who do you see responsible for coordinating and managing a platform where retail should be integrated?”).

We asked these questions with the intention to allow the interviewees to narrate, but also to start drawing their individual networks. This simultaneous procedure of drawing and narrating proved to be most fruitful, as drawing the network step by step provides multiple incentives to narrate [92]. Using these graphic representations of the social worlds of each of the interviewees is one of the key issues in social network analysis [93,94]. We collected social network data within each interview by means of a net-map, which

is a “low-tech, low-cost, interview-based mapping tool” [26]. A net-map consists of a simple technique that relies on paper and pencil. We provided each interviewee with white paper (A2), which was pre-structured with concentric circles (see Figure 1 for an example), as well as colored post-it notes and different pens, and then asked them to draw the network while talking about it. Apart from those circles, which were supposed to represent the different levels of importance of the stakeholders, we avoided pre-defining the networks. Our objective was, rather, to understand how the different stakeholders perceived the networking process [95]. Interviewees were free to add additional information to the networks, work with different colors, or highlight the most important stakeholders. However, the outcomes of the drawings were diverse. Some interviewees intensively used this means of visual expression (see Figure 1) and showed themselves to be surprised by the outcome. However, other interviewees did not really know how to relate to it, and preferred talking rather than filling out the net map. In the latter case, we did not force the interviewee to fill out the net map.

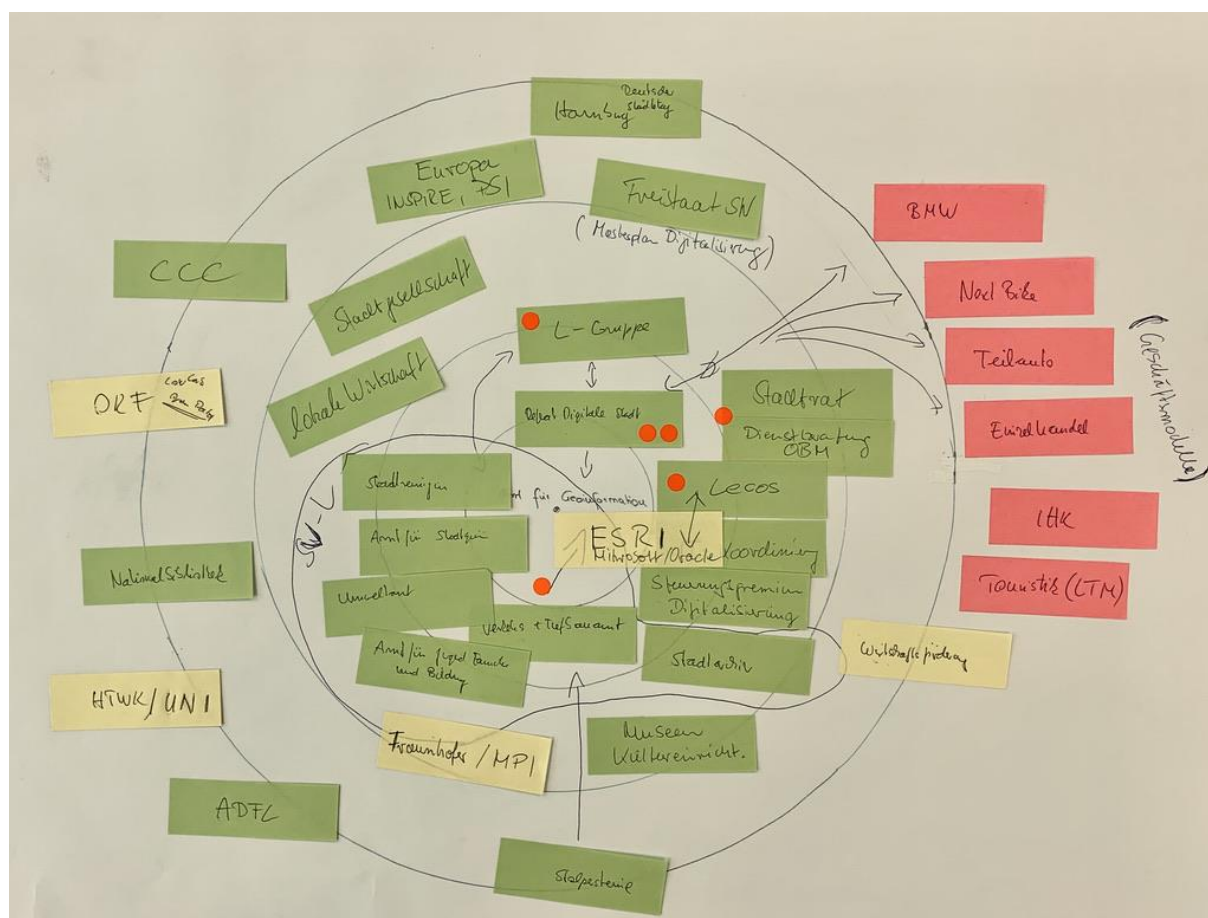


Figure 1. Example of a network drawn by one of the interviewees. Orange dots mark institutions that are most important for the interviewee when it comes digitalization, retail and the city.

The interviews were conducted between June 2019 and September 2019 in German and were recorded using a voice recorder. All interviews followed the data protection guidelines of the General Data Protection Regulation of the European Union [96]. With regards to the analysis of the material, we used both the interview (audio and transcript) and the map itself to answer the research questions related to stakeholders, relations, or ties [97].

Our qualitative analysis of the material was based on Mayring [98]. We focused on categories and codes, in order to analyze the transcribed interviews in a structured way [99] (see Table 2). With regards to building categories, we used a combination of inductive and

deductive approaches. Some of the main and sub-categories were identified based on other theories and were thus reflected in the interview guidelines (deductive); while most of the sub-categories were built using the material itself (inductive) [100].

Table 2. Analyzing the material: main categories and selected sub-categories.

Main Categories	Sub-Categories	References
Stakeholders	Public and municipal stakeholders	125
	Associations	45
	Educational institutions	12
	Others	33
Intersections	Concepts for the city center	27
	Wi-Fi initiative	8
	3-D plan of the Christmas market	4
	Workshop “City Center”	3
Retail data	Initiators	13
	Obstacles	54
	Merging with urban data platform	18
	Maintenance of the platform	15
Urban data platform	Urban data platform Leipzig	31
	Data availability in Leipzig	12

The third approach that we drew from was ethnography, referring to “a perspective on research rather than a way of doing it” [101,102]. Through this, we aimed to critically analyze our position as researchers within the research process. We discussed the interviews within our group of researchers, shortly after the interviews were conducted and a year after SURTRADE had finished (end of SURTRADE: September 2000). We also documented our discussions. This helped us to stay close to the research object, while also gaining distance from the research project, in order to better reflect on our own perspective. It is particularly the reflexive turn within ethnography that motivated us to critically assess our position as scientists within the research, and also to reflect on our influence on the network analysis [103]. Arguing from the point of view of focused ethnography, we are interested in how the stakeholder network was constituted within a certain set of temporal and spatial structures, and which personal attributions and constructions of meaning of the individual stakeholders were generated by us [104,105]. Our reflections are detailed further in the final section (discussion).

4. Towards Retail Data Integration—Requirements to Establish the Stakeholder Network in Leipzig

In this section, we present the results obtained based on the methodology described above. According to the research question, we explored how the stakeholder network should be designed to integrate retail data into a UDP in Leipzig. For this purpose, we first looked at the requirements of the stakeholder network and identified the importance of the common understanding of stakeholders on the matter as a major requirement. This led to the interpretation of relevant terms, such as “urban data platform,” and its relation to retail (Section 4.1). Second, we referred to the need for common perceptions and goals (Section 4.2). Third, we analyzed the stakeholder interpretations of each other’s roles and, therefore, referred to the requirement of a distinct allocation of roles and tasks to manage the data integration process (Section 4.3).

4.1. What Is an Urban Data Platform? Common Understandings and Applications as Framework Conditions

Before our survey took place, we had already not only had discussions about the possible introduction of an urban data platform (UDP) by stakeholders of the city administration in Leipzig, but also the groundwork on which such a platform could be built. Based in the Office of Geoinformation and Land Management (I4, C-GEO), the Geodata Infrastructure contains the “conceptual structure of a UDP”. The current purpose of the Geodata Infrastructure is to provide “data from the offices for the offices” (I4, C-GEO). Through the introduction of a UDP, the Geodata Infrastructure is to be extended to “data from the city for the city” (note: “city”, for German “Stadt”, in this context can mean both the city and the city administration). Challenges for the city administration are the different (municipal) originators of the data and the question of which internal data should be included in a UDP. Different understandings by the various stakeholders in and related to the city administration complicate the process, as a staff member explained: “We [...] are now also working on building a common understanding for a UDP together with the city operations. That is not so easy” (I4, C-GEO). There is already a working group for a common understanding of the UDP to deal with this issue (I3, C-DIG).

In its “project developer function” for the UDP, the Agency of Digitalization (I3, C-DIG) supports the Office of Geoinformation and Land Management (I4, C-GEO), which is primarily responsible for the technical implementation. The Agency of Digitalization was established in Leipzig in 2020. Similar to the Office of Geoinformation and Land Management, the head of the Agency of Digitalization considered various challenges; not only in the technical realization, but in the implementation of the UDP within the city administration:

“We have to first develop some kind of common understanding with our associated companies [city operations] of what the urban data platform is, because when someone says urban data platform, some people immediately think only of open data platforms, while others think it’s only about municipal data, i.e., city administration data. To sound this out, so to speak: What are we actually talking about, what function should it fulfil, what goals are we pursuing, where are the boundaries?” (I3, C-DIG).

Thus, the issue is not only about collaboration within the various offices of the city administration, but also about cooperation with “city operations” (I4, C-GEO) as other municipal stakeholders, especially the L-Gruppe (with about 5000 employees), which is a 100% subsidiary of the City of Leipzig. It includes various public utility companies in the areas of mobility (public transport and e-mobility), water, and electricity (both electricity grid and power plants) [106] L-Gruppe 2022). A potential conflict is already apparent here. The competition between (semi-)public and private data have made the L-Gruppe cautious about sharing data.

Another aspect that resonates within the city administration is open data. “Open data is data that can be freely used, reused and shared by anyone—the only restriction concerns the obligation to name the originator” [107]. However, the definition of open data and how to use it in Leipzig varies between the different stakeholders. If it were up to the Office of Geoinformation and Land Management (I4, C-GEO), “open data is the future (for our data),” but they also pointed at the need to discuss the term and topic between the relevant stakeholders of the city administration as potential originators of the data. The Agency of Digitalization (I3, C-DIG) also sees open data as a building block for the UDP, but would not describe the UDP as an open data platform. In their eyes, not all open data will be published freely on the UDP. This not only poses legal challenges but would also weaken the currently existing licensing model for urban data within the city administration. Thus, it requires changes at both municipal and federal state levels in Saxony.

In this respect, the (technical) foundations for a UDP already exist, but there are many challenges within the (semi-)public sector, regarding content, scope, rights, and even the fundamental understanding of such a platform. Private stakeholders or associations do not seem to play any role within the discussions. These ambiguities point to potential

difficulties in the introduction of retail into a UDP and might complicate its implementation, as detailed in the next two sections.

4.2. *Why and How to Integrate Retail Data—Common Perceptions and Goals*

Building on the city administration's plans to establish a UDP containing "data from the city for the city" (I4, C-GEO), the integration of retail data could be the next step for retail stakeholders in Leipzig. In all interviews, interest and a basic agreement to the introduction of a retail platform were indicated. Nevertheless, the various stakeholders had different understandings not only about the UDP but also the integration of retail and the chances and challenges involved. Similar challenges arise with retailers, as was found in the interview with the representative of the trade association of Saxony (I9, A-RETL2). He highlighted both the integration of (small) retailers and maintenance as possible challenges. (I9, A-RETL2): "You have to educate retailers (...) Leipzig's retail platform, that could be anything [for the retailers]." It remained unanswered who could provide this education in Leipzig. Stakeholder perspectives and priorities, in terms of retail data integration, further vary depending on their focus and field of activity. As indicated above, there is a basic openness in the Agency of Digitalization (I3, C-DIG) and in the Office of Geoinformation and Land Management (I4, C-GEO). According to the Agency of Digitalization, they could probably link retail information, as well as other information (e.g., C-DIG named information about the current traffic situation), with a UDP dashboard (i.e., graphic user interface). A similar view was shared by the Office of Geoinformation and Land Management: the integration of retail is theoretically feasible for the UDP, for example, to show whether a product is locally available at present. The representative of the Economic Development Office (I5, C-ECON) was the most critical. He understood the importance of cross-channel distribution but considered the funding and integration of small retailers to be difficult. Especially when considering costs, retailers already worry about the high rents in the city center. The urban planning department staff member responsible for retail (I2, C-PLAN) considered the integration of retail data as an "important piece of the puzzle" for successful brick-and-mortar stores, but "not as a panacea" for their overall problems. Overall, these statements were not very concrete, which is not surprising, given the stage of development. It became obvious that the information level varied between the different stakeholders. For example, in response to the question regarding retail data integration, the LTM interviewees (I6, A-TOURI) mainly pointed to their informative websites. However, neither did they have their own projects, nor were they informed about municipal projects, while they saw a platform to integrate retail and other stakeholder data in the context of urban tourism as an "utopia" (I6, A-TOURI). In general, financing was seen as a (central) problem in all four interviews with the representatives of retail associations (I6, A-TOURI; I7, A-RETL; I8, A-MARK; I9, A-RETL2).

It appears that some stakeholders directly linked the SURTRADE project to a potential platform for retailers, and that SURTRADE influenced their perception. While the governmental stakeholders tended to focus on initiatives within the city administration, this was especially the case for the retail associations. For example, the City Marketing Association (I8, A-MARK) did not make any precise statements about how the integration of retail could look, but oriented itself based on the approaches presented by the SURTRADE project and on examples from other cities. The interviewee pointed to the holistic approach of SURTRADE, which comes "on a plate" and which was missing so far in other approaches (e.g., private LOP initiatives). The interviewees from the Chamber of Industry and Commerce Leipzig (I7, A-RETL) pointed to examples from other cities and their challenges, but also to the chances provided by SURTRADE as a "sustainable, gentle process".

4.3. *Stakeholder Relations—Distinct Allocation of Roles and Tasks to Manage the Retail Data Integration Process*

While the previous sections primarily highlighted the specific perspectives of the individual stakeholders, this section focuses on their identified roles and connections to

other stakeholders within the process. To make the connections more obvious, we drew a stakeholder map, which includes the relevant connections and marks the potential roles of the respective stakeholders (see Figure 2).

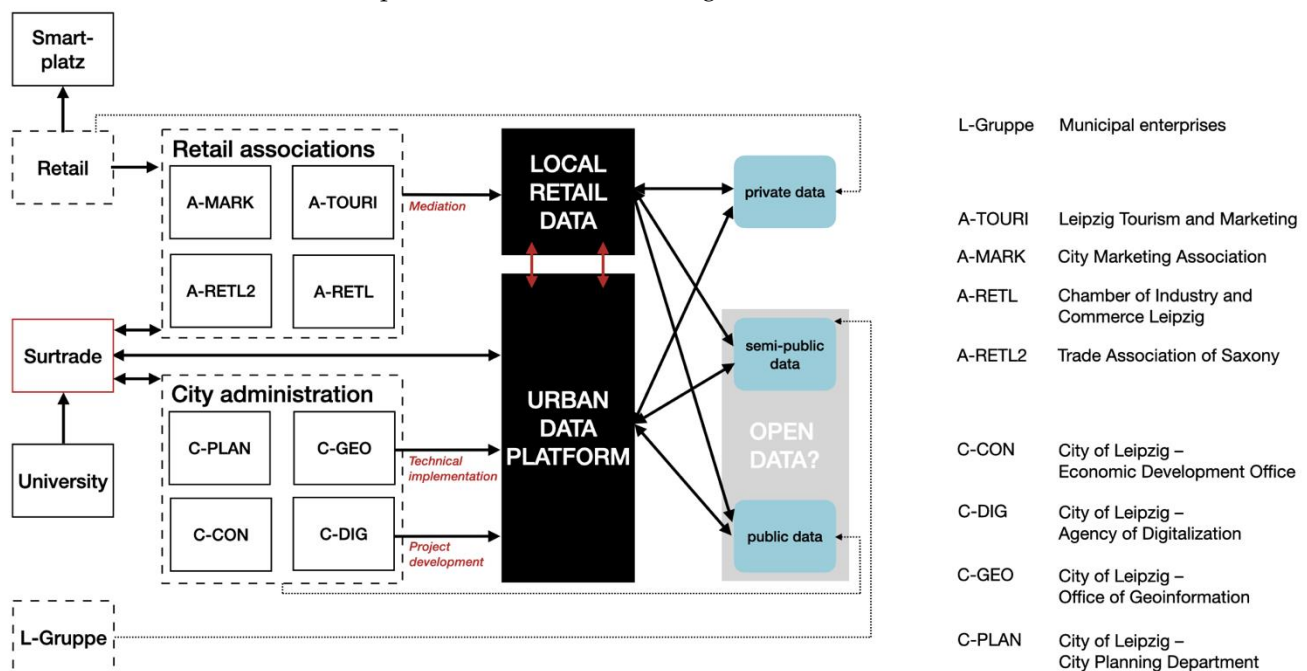


Figure 2. Schematic representation of the connections between a potential retail-integrating UDP and its stakeholders, using the example of Leipzig.

The interviewees were asked to specify the roles of the individual stakeholders. The recurring roles named were initiator, communicator, advisor, technical implementer, and maintainer of the platform. The interviewees frequently saw the initiator for setting up an urban data platform including retail being City Marketing Leipzig e.V. (A-MARK), as this retailer association bundles the interests of retail stakeholders and represents them in the city. However, the Digital City department (C-DIG) and the Office for Economic Development (C-ECON) were also seen as initiators. The stakeholders surveyed viewed the attractiveness of the city center through the lens of an intact retail sector, and considered it a municipal task. The Chamber of Industry and Commerce Leipzig (A-RETL) was considered to be the most important communicator. An advisory function was assigned to the University of Leipzig (ULE), due to its experience in the SURTRADE research project. The technical implementation was mostly carried out by the Office for Geoinformation (C-GEO) or an external company. Regarding the maintenance of the platform, the retailers were considered responsible for updating the data on a regular basis, whereas technical maintenance was the responsibility of the technical implementer; that is, the Office of Geoinformation (C-GEO). Interestingly, no stakeholder felt specifically responsible for initiating or managing the process of integrating retail data into the UDP.

The city administration's stakeholders mentioned the responsibility of retailers for their own business but could provide some support, even though its capabilities are limited, especially in terms of supporting individual stakeholders: "We have to make sure that the city acts in a competition-neutral way" (I2, C-PLAN). A potential consequence of a platform that is initially limited to municipal stakeholders and a few active retailers could also result in a free-rider problem if other retailers profit from the commitment of the initiators. This also means that the city center, which would be pre-destined due to its retail density, must not be favored over other neighborhoods. A city-supported platform would, therefore, have to ensure that stakeholders outside the city center could also be integrated. Such a lack of clarity regarding the scope of a platform leads to further potential conflicts. One of the interviewees referred to questions of financing, not only how much but, rather, who

may charge what from whom, summing it up with: “where do you start, where do you stop?” (I6, A-TOURI).

Concerning the interviewed associations, only I9 (A-RETL2) could imagine being an initiator to bring together retailers. The others (I6, A-TOURI; I7, A-RETL; I8, A-MARK) referred to their limited financial means, responsibilities, and resources. Still, they could imagine being active in a supporting and coordinating manner. The City Marketing Association (I8, A-MARK) saw its potential role as a communicator; for example, in establishing contacts with business stakeholders. Instead, municipal stakeholders were mostly identified as possible initiators and as responsible for maintenance, although sometimes different departments of the city administration were considered for these roles. The city administration was partly seen as responsible (I2, C-PLAN; I4, C-GEO; I6, A-TOURI; I7, A-RETL; I8, A-MARK), as well as the retailers/retail associations (I7, A-RETL; I9, A-RETL2) and external contractors (I2, C-PLAN; I9, A-RETL2). Subsequently, it was frequently mentioned that the responsibility not only for maintenance, but also for the content and business model, may be a potential source of conflict.

From the interviews with the retail associations, we concluded that the retail sector is made up of conflicting stakeholders who face different challenges posed by digitalization, and who possess varying capabilities regarding the digitization of their retail assortments. Small retailers could be challenged by the “effort to keep the data up to date” (I8, A-MARK), while chain stores usually already offer cross-channel and are, therefore, less interested in a joint platform. Furthermore, the willingness to participate seemed to be limited and the integration of individual product details could, therefore, fail: “Various other projects have shown that they cannot motivate retailers sufficiently. They might be able to motivate individuals, but there are few of them, to actively participate” (I8, A-MARK).

Looking beyond Leipzig, the city is in close contact with other municipalities, such as Hamburg, which already have UDPs in operation. Consequently, Leipzig is trying to learn from pilot projects in other cities. This exchange will support the development of private data integration processes in the future.

5. Discussion

Our stakeholder network analysis regarding the requirements for the integration of retail data into an urban data platform in Leipzig revealed some crucial conflicts that inhibit the process at present:

1. First, there are different understandings of basic and relevant tools, such as UDPs or open data, as predicted by Neiberger et al. [80].
2. Second, not all stakeholders share the same perception and goals regarding retail data integration and, thus, name diverse challenges.
3. Third, the stakeholders assigned different roles to each other, with regard to the task of data integration. They (at least partly) assign responsibility to other stakeholders who, in turn, cannot perform these tasks from their own point of view, and do not wish to take on any responsibility themselves to manage the process.

If the city administration, as the urban planning institution, is to take on more responsibility in this process in the future [50–52], a separate moderation process is required, in order to preliminarily reveal and discuss the mutual understanding and positions of the individual departments. The city administration’s role is too diverse in this process [53]. Even for the retailers, there are strong disagreements with regard to a common local and digital strategy. If the proportion of owner-operated stores in the city center continues to decline, this trend could become even more severe.

If we reflect on the role of the SURTRADE research project, we must note that the project had a decisive influence on the general initiation of the process. It is possible that the discussion to integrate retail data into an urban data platform would not have emerged at all without the project. The question, then, is who can initiate such a process most effectively, when we find that little activity has gone into continuing the process since the end of the research project. Moreover, as researchers in the field of urban development, we

assume a specific role and ascribe responsibility to urban planning. The question is whether the efforts to create an urban data platform from the perspective of urban planning have actually been as cooperative as stakeholders have stated to date. Ultimately, the discussion regarding this platform takes place very internally, possibly leading to this very different interpretation of what such a platform must and should be able to do. In particular, when it comes to the future role of retail in the city, and in the light of its difficult situation (not only since the COVID-19 pandemic), an openness of the communication process is certainly necessary when discussing the UDP (urban data platform). This includes private stakeholders and the consumers themselves, as consumption patterns constantly change due to diverse external shocks [9,13]. If not COVID-19, what kind of shock could accelerate change? This also applies to the attitude towards open data: retailers are understandably more reluctant to disclose customer-specific data. Here, too, an understanding process would therefore have to take place. Furthermore, it must also be noted that the Agency of Digitalization (C-DIG) was only established at the end of the SURTRADE project, and the initiator of the urban data platform was not yet in a position to think through such complex processes at that time. However, C-DIG, C-PLAN, and C-GEO are involved in the CUT project (Connected Urban Twins), a common project that initiated the process to establish UDPs in the cities Hamburg, Munich, and Leipzig. CUT is funded as part of the Smart Cities model projects of the Federal Ministry of Housing, Urban Development, and Building (BMWSB). The CUT project began in 2021 and will last until 2025, which means that the interim results are still being negotiated. The latest achievement of the stakeholders in these cities was to find a common understanding of the concept of a UDP. During a public online event in April 2022, initiated by the City of Leipzig and University of Leipzig, C-DIG, C-PLAN, and C-GEO explained how retail data could be connected to the UDP. In their eyes, retail data could appear as a kind of LOP in the form of a specialized UDP within the larger UDP. Specialized UDPs can have different foci, functions (e.g., visualizing, and applications), and stakeholders involved. It remains to be discussed who would be involved in this process concerning a specialized retail UDP, but urban planning, as the platform facilitating stakeholders would actually take on more responsibility [50–52,54,55].

The presented results indicate the complexities of initiating and operating a UDP at different levels of abstraction. The spectrum ranges from the business decisions of individual retailers and the establishment of relationships between the various parties involved, to the apparent binaries of public and private as well as cyberspace and space. At the same time, the difficulties that digitalization pose for both public and private stakeholders are shown in exemplary fashion. For the retail sector, ‘maintenance’ primarily means keeping their online offerings up to date. For the city administration, on the other hand, in its responsibility for the local social infrastructure, ‘maintenance’ should take on a much larger scope [108].

Digitalization in an urban context—be it within the administration or in the retail sector—does not simply happen with a mouse click or keystroke. It is embedded in the local conditions: the socially produced space [27]. A UDP (including retail) must, thus, also go beyond a simple dashboard that gives the appearance of being able to digitally map ‘the city’ in a few key figures (C-DIG concerning “dashboard”) [108,109]. The interviews showed that a diversity or coupling of functions is seen as an elementary component of a future platform. Accordingly, the initiation of a UDP cannot take place without negotiation processes between the various urban stakeholders and networks, if the goal is to digitally map the broadest possible diversity of the city.

However, “the assumption that e-commerce is merely a framework condition that exacerbates structural change falls short. It tends to stand in the way of a constructive examination of the relationship between virtual and local space. The idea of a dichotomy between e-commerce and bricks-and-mortar retailing, in which the former takes market share from the latter, is too simplistic. There are no independent worlds (...)” [80], referring to the recombination of cyberspace and space. In the same way, city administration and retail are not independent worlds. Both are part of complex urban networks that will

continue to develop in the coming months and years, both in response to the pandemic and otherwise.

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