

Review

Assessing Resources Management for Sharing Economy in Urban Logistics

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Abstract: Sharing economy requires cities to redefine their management strategies. As a consequence of the development of new ideas, the main aim of modern cities should focus on achieving the sustainable use of resources. In the existing literature, only a partial analysis of resources management in cities can be found. For this reason, the authors decided to prepare the framework for empirical research about resources management in sharing economy in cities, especially in the urban logistics system. The main aim of the study is systematizing criteria related to the assessment of the management of urban resources in the era of sharing economy. To achieve the goal of the research, a systematic literature review was made according to chosen approaches and procedures. This resulted in creating a set of criteria for the analysis and evaluation of resources management in urban areas. It contains five areas with 26 criteria and a map of assumed correlations between them. Those outcomes can be used by local authorities or even other urban logistics stakeholders to define or improve their actions aimed at developing a sharing economy services portfolio on the local market. Additionally, they constitute a set of initial information for further scientific research.

Keywords: resources management; city logistics; urban logistics; sharing economy; urban management

1. Introduction

Socioeconomic life depends, to a large extent, on the possessed resources. In a sense, the complexity of factors shaping socioeconomic structures, including resource-related factors, could be referred to by analogy with Tobler's law, according to which "everything depends on everything". Studies of literature allow us to state that, among all factors influencing the shape of socioeconomic structures, the following factors are synthetically distinguished: economic, political, geographical, demographic, cultural factors, technological, political, etc. Within a broadly defined range of factors, from the point of view of the adopted goal of the study is particularly important for economic factors, including resource-related ones [1]. However, it should be clearly emphasized that the groups of factors overlap and interact. For example, space and location belong to categories that should be identified with geographical factors. The city and non-urban areas refer to this criterion, which influence the resource management strategy. These sciences "by" category of place try to undermine existing research methods and "say something new about the world." An emphatic example can be the views of P. Krugman, according to which the economy has somehow rediscovered space and place, trying to include them in its own way of analyzing the economy, including resources management [1].

Regardless of the multi-faceted nature of various factors shaping socioeconomic systems, the possession and use of specific resources underlies the satisfaction of various needs, constituting a

factor motivating all human activity. The issue of defining resources and classifying them has already appeared in the thoughts of classical economists (as an example: W. Petta, A. Smith, J.B. Say, D. Ricardo), and the achievements of classical economic thought constitute the basis for contemporary approaches related to resources and their impact on the economy [2]. J.A. Schumpeter saw the essence of a specific resource in innovations, which he defined as new combinations of various material elements and the productive power of man [3]. This concept is also used in urban logistics [4].

Regardless of using the specific term describing the city, the main focus of the urban management became controlling resources. According to Parra et al. [5], the main aim of smart cities is “to achieve the sustainable use of resources”. A part of the smart city concept is sharing economy, aimed at improving the use of existing resources. It intuitively makes sense, from a sustainability point of view [6]. However, Schor [7] suggests that defining the sharing economy itself is “nearly impossible”. It is known that sharing economy shares unused idle resources with others, reduces waste and represents the interest of local society [8] Going further, for sharing economy, perhaps the better name is “collaborative consumption”, categorized as the “recirculation of goods, increased utilization of durable assets, exchange of services, and sharing of productive assets” [6]. This definition relates the sharing economy with resources management—more—embedding it in the 3R principle (reduce, reuse, recycle), which is a central element of green growth policies [9]. The modern city has many faces, and multiple researchers tried to describe its nature as a smart city, green city, sharing city, circular city, etc.

The literature shows only a partial focus on resources management. Numerous researchers contribute to the topic only in some very limited areas considering only individual resources, identifying them with—e.g., only natural resources or only information. The description of the topic in the literature is narrow, selective and limited. This gap was the reason for extensive literature review and the building of the research framework for the empirical research about resources management in sharing economy in cities, especially in urban logistics. Combining resources management in a broad sense (not only information, human and natural separately, as present literature review, results in this study) was not done in the literature. Therefore, the aim of this review paper was to organize issues related to the management of urban resources in the era of sharing economy, in particular defining the criteria for assessing the resources management in sharing economy in urban logistics and identifying their potential relations. This aim was achieved by carrying out the research divided into several steps described in the next sections.

The structure of the paper was subordinated to the objective. Firstly, resources management in urban areas was mentioned, with its specifics and main problems. Then, sharing economy in cities was discussed as a new direction of urban development. The next section presents the methods used in the research process inscribed in the research framework. The results show the full set of criteria for assessing resources management in the urban sharing economy. This section also presents interactions between those criteria. Section 5 discusses the results of the literature presented in Section 2. Section 6 concludes the paper, highlights its limitations and draws future research directions.

2. Literature Review

2.1. Resources Management in Urban Areas

In contemporary research, numerous theories relate to the defining nature and main characteristics of resources. Resources are often perceived through the prism of tangible and intangible character and monetary and non-monetary resources, as strategic factors for the development of the enterprise and its success on the market.

The basic assumption of the resource-based theory is the statement that specific, unique resources and skills (so-called strategic assets) enable enterprises to gain lasting competitive advantage. It is natural to refer resource theory to the main research area of this paper—logistics.

Logistics literature very often refers to resource elements of logistics systems, including city logistics systems [10]. Cities are specific socioeconomic systems, where the diversity and scarcity of aggregate resources in a small space and the need to control them is an important management problem. This issue can be solved by using multi-criteria logistics models, the theory of which can become the theory of sharing economy, sustainable development, green supply chains, CSR, etc. [11,12].

The specifics of resources management in cities result from a high density of population, infrastructure elements and traffic [13–15]. Some of the resources are available only in cities or suburban zones (e.g., related to public transport), some are managed differently than in non-urban areas (e.g., forests, parks) [13]. That is why some of the urban resources are treated as particularly important [14]. Schneider et al. [9] define six factors of the sustainable resources management in sharing economy as:

- The resource itself (resource scarcity and availability of waste);
- Actions of government (regulations and standards and financial support);
- Economy (economic benefit, financial payback and new business opportunities);
- Organization of social characteristics (short mental distance, trust, security and awareness);
- Technology (especially issues related to innovation);
- Society (social organization or support system).

That is why, apart from the issues related to sustainability, the other, similar and the widely discussed topic is the urban circular economy. It is defined as “economic model wherein planning, resourcing, procurement, production and reprocessing are designed and managed, as both process and its output. The aim of this model is to “maximize ecosystem functioning and human well-being” [15,16]. It directs the focus on sustainability with its three dimensions: economic, social and environmental [17]. Circulation of resources being sustainable can be based on collaboration (and communication) between the different groups of stakeholders or within one group (e.g., peer-to-peer logistics in C2C channel). It can be challenging, especially in big, diverse metropolitan areas [18]. Stakeholders’ participation in multi-stakeholder dialogue is a slow, gradual process that requires research and continuous stakeholders’ analysis [19,20]. A number of economic terms and measures should be included in this analysis, such as economies of scope and scale, costs of lost opportunities and benefits, especially when resources are scarce, finite, and their use-restricted [21].

A very complex approach to defining the resources presents C. Mańkowski [22], who adopted the A.W. Scheer’s approach to resources management to logistics. It is widely used in mapping, modeling and simulation of processes and systems according to the EPC notation (Event-driven Process Chain) dividing the resources into four groups:

- Material (e.g., raw materials, tools, machines etc.);
- Human;
- Capital (money);
- Information.

This approach of classifying resources, widely used in business and public space (e.g., also in transport) is appropriate to use in this study because takes into consideration all of the possible resources, not only the natural ones, IT-related, only human, etc. It is used to describe the whole organizations: their structures, main processes (map of all processes and maps of those detailed processes), data management, IT architecture and products.

2.2. Sharing Economy in Cities

In the last ten years, the number of concepts about sharing economy has grown as fast as the number of theories about resources management in cities. The most popular one is constituted by the United Nations [23]. According to this, sharing economy combines the elements of peer-to-peer

economy, circular economy (being related to sustainable development) and access-based economy (opposite to owe-based economy) (see Figure 1).

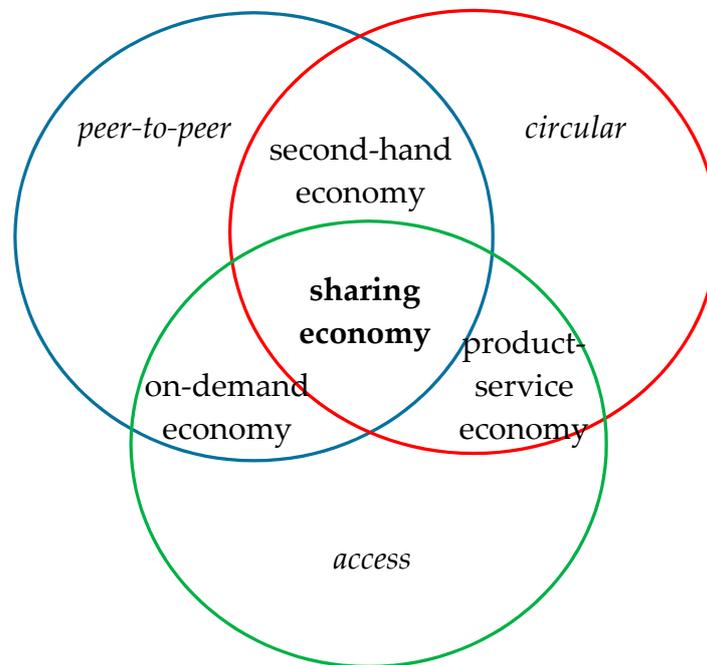


Figure 1. Different kinds of economies creating the sharing economy. Source: [23].

Sharing economy is a concept involving the sharing and exchanges of products and services, giving access to resources in case their capacity is not fully used [24,25]. This notion can be defined as an alternative social and economic movement that shares unused idle resources with others to reduce waste and ultimately contributes to the increase in common interests in society [26]. Idle resource sharing has previously been used in small communities, where individuals can sell or trade excess goods to other people. The initial system was designed to utilize idle resources rather than to make a profit. Both the provider and the consumer of the product were individuals who were to share the remaining goods [27]. In a sharing economy, consumers can be both the main customer and a provider of items.

In recent years, collaborative practices have multiplied and expanded, giving rise to various sharing initiatives. In fact, we have to realize that the idea of sharing is not new; people have used sharing since the beginning of civilization. However, the concept of collaborative initiatives began to attract a lot of attention since the development of new digital technologies that put a glimpse for collaboration as well as sharing. The current sharing economy has grown to become a business model capable of economies of scale due to the popularization of smartphones, the development of Internet technologies and social network services [28]. The sharing economy term is used in contrast with notions such as: collaborative consumption [29], circular economy [30–32], peer-to-peer economy [33] and consumer-to-consumer economy [34,35].

Cities around the world have become central places in research of the nature of the sharing economy solutions. Current sharing initiatives are perceived mostly as an urban phenomenon and actually, the majority of them takes place in the metropolitan areas. These facts make cities' authorities responsible for the development of urban sharing economy initiatives, similarly as for any other initiatives emerging locally. Issues of governance in sharing economy are numerous and touch upon various policy fields and areas of law, such as ownership, labor, consumer protection, data protection, insurance and liability, trade, competition and taxation [36].

Sharing economy has a direct impact on cities' functioning as well as dwellers' quality of life. Mainly it can be characterized by the potential benefits for both of them in economic, social and environmental (in whole—sustainable) dimensions:

- Enhanced efficiency in urban areas [37];
- More entrepreneurial activities [38];
- Improved services [39];
- Efficiency in urban transport system [40,41];
- Helping in solving current urban challenges [42,43].

It is worth noting that, for an industrialized country that has achieved economic development, the sustainable character of sharing economy will be different from those of developing countries. For such a country, sustainability would mean the management of scarce resources efficiently while ensuring the continuity of current economic growth. Thus, environmental sustainability would be superior, or at least ranked equal, to economic sustainability [44].

Taking into account all dimensions of sustainability, generally, in the sharing paradigm, society's reputation and relationships—the “social capital”—matters more than the financial capital. It enables sharing to be more inclusive, regardless of our financial means. Traditional communal and sociocultural forms of sharing have always brought reputation to the fore. Nowadays, we can notice commercial sharing platforms actively investing in replicating these benefits of communal sharing [45].

In the sharing economy, the border between professionalism and non-professionalism of services is blurred. Nevertheless, by looking at the particular characteristics of the to define providers of services in collaborative economy models, some general criteria services can be identified [46]:

- Frequency of service—if the service is provided on a regularly it is more likely to be treated as professional;
- Reason for service providing—if the primary purpose is to earn, the provider is more likely to be seen as a professional;
- Level of income—the higher is the income, the more likely the service will be classified as professional.

Sharing economy initiatives in cities are applied in various spheres. The most known are associated with mobility, transportation and spaces sharing. However, actually more fields with sharing initiatives are being applied in cities. They are related to financing, health, learning services, utilities sharing, as well as different goods demising (see Table 1).

The sharing solutions in cities mentioned and described in Table 1 are initiated by individuals or private entities. Worth noticing are initiatives leveraged by cities themselves. For cities' authorities, the problem in sharing economy initiatives comes mostly from the lack of their efficiency. Nevertheless, cities' authorities notice the potential of sharing in various areas; the most popular cases of sharing are mentioned in [47,48] and are presented in Table 2.

Table 1. Private sharing economy initiatives in practice.

No.	Group	Solution	Characteristics	Practice	Sources	Resources Managed [25]
1	MOBILITY	Ride-sharing	Matching drivers of private vehicles to those seeking local transportation services Resources(R): private vehicle, Smartphone Application Support (SAS): yes	Blablacar (France)	[49–53]	Information, human, material
2		Ride sourcing	Enabling traveler the request of real-time ride by part-time riders R: own vehicle of driver; SAS: yes	Uber (US), Bolt (Estonia)	[54]	Information, material, human
3		Ride splitting	Using the shared vehicle and splitting the fare R: shared vehicle; SAS: yes	Uberpool (US)	[55–57]	Information, material, money
4		Vehicle sharing	Car rental where people rent cars for short periods of time R: vehicles owned by sharing company; SAS: yes	Traficar (Poland), MiiMove (Poland), zipcar (US)	[58–60]	Information, material
5	SPACES	Accommodation	Peer-to-peer, ICT-enabled, short-term renting, R: private house/apartment SAS: no/yes	Airbnb (US), HomeAway (US)	[61–65]	Information, material
6		Workspace	Workstations rented by remote employees, who may not have a central office R: space; SAS: no	WeWork (US), shareDesk (IS)	[66,67]	Information, material
7		Storage space	Connecting people in need of storage space with people who have space to share R: unused storage space; SAS: mostly yes	MakeSpace (US), SpaceOut (US)	[68–70]	Information, material
9		Crowdfunding	Funding a project or venture by raising small amounts of money from a large number of people, typically via the Internet. R: money; SAS: no	Gofundme (US), Kickstarter (US)	[71–73]	Information, money
10	FINANCING	Insurance	Allows members to increase and ensure each others' deductible, thus lowering the premium paid for their individual auto insurance policy. R: money; SAS: yes (sometimes)	insPeer (France), friendsurance (Germany)	[74]	Information, money
11		Money lending	Online credit marketplace at a lower cost than traditional lending programs, passing the savings on to borrowers in the form of lower rates R: money; SAS: mostly yes	lendingClub (US), Prosper (US)	[35,75,76]	Information, money
12	LEARNING/SKILLS	Open courses	Creating a set of online tools that help educate people in various spheres by offering short lessons in the form of videos R: skills; SAS: no/yes	Udemy (US), Khanacademy (US)	[77,78]	Information
13		Peer-to-peer learning	Online learning community for people who want to learn from educational videos or from other by joining the learning circles R: skills; SAS: no/yes	P2PU (US), Skillshare (US)	[79,80]	Information, human
14		Professional services	Online platforms that connect professionals to conduct business or to share experiences R: professional skills; SAS: no/yes	Upwork (US), crowdspring (US [39])	[81,82]	Information, human

Table 1. Cont.

No.	Group	Solution	Characteristics	Practice	Sources	Resources Managed [25]
15	HEALTH	Medical services	Provision of medical services online thus elimination of barriers that prevent people from traveling to appointments R: medical skills; SAS: yes	Dr. on demand (US), CrowdMed (US)	[39]	Information, human
16		Medical equipment	Reallocates medical equipment, so hospitals make the best use of assets they already own, decreasing redundant purchases and costly rentals R: medical equipment; SAS: no/yes	Cohealo (US)	[83,84]	Information, material
18	UTILITIES	Telecommunication	Peer-to-peer mobile Internet connection sharing with faster and more efficient data transmissions by automatically and actively choosing and switching to the best available network without requiring users to manually sift through available networks to find the best one available R: data transmission; SAS: yes	Open Garden (US)	[85,86]	Information
19		Information	Developing, sharing and reusing the data of companies and public administrations R: data; SAS: yes	Opendatasoft (France)	[87,88]	Information
20		Energy	Enabling using green energy produced by independent producers, sold with help of dedicated platforms to individuals and business customers R: Energy; SAS: yes	Vandebroon (Netherlands), Gridmates (US)	[89,90]	Information, material
21	GENERAL GOODS	Used/unused products	Reusing and recycling surplus redundant resources such as furniture, equipment, fixtures and fittings within your organization R: goods; SAS: no/yes	letgo (US), OLX (France)	[91,92]	Information, material
22		Loaner products	Online service that provides designer dress and accessory rentals. R: goods; SAS: yes	Rent the runway (US), peerby (Netherlands)	[93,94]	Information, material

Table 2. Municipal sharing economy initiatives in practice.

No.	Group	Solution	Characteristics	Practice	Sources	Resources Managed [25]
1.	ASSETS	Assets sharing	The initiative concerns city-owned machinery, equipment and vehicles that are shared among departments or with neighboring municipalities	Munirent	[95,96]	Material, information
2.		Assets tracking	The solution is related to asset-tracking, rental and sale features to manage surplus equipment. It is used by the cities to create product subscription services.	myTurn	[97,98]	Information, material
3.	SPACES	Municipal spaces sharing	Civic spaces, such as gardens, subways, city-run schools, hospitals and libraries, and city recreational centers. Idle capacity in municipal spaces can be used for urban farming, pop-up shops, parking and start-up hubs, supporting local business and culture	NYC “This land is your land” initiative	[48]	Material, information
4.	SERVICES	Municipal services sharing	Municipal authorities have collaborative agreements in many areas, to facilitate providing services to the citizens they serve and have been working together in this way since long before the sharing economy	Alberta, Canada: “Intermunicipal Collaboration Framework”	[99]	Information, human
5.	SKILLS	Municipal residents’ skills sharing	Sharing of residents’ skills or professional experiences organized by the municipalities	“My Real Trip” Seoul	[100]	Human, information
6.		Municipal time-banking	Residents give up their time for public tasks while having access to the public resources	“Programme of Time and Caring Economy” Barcelona	[101]	Human, information

3. Methods

3.1. Research Framework

Due to the conceptual chaos and fragmentary nature of the description of resources management in sustainable urban logistics, the authors came to the conclusion that the literature review should be carried out in accordance with a selected procedure or several procedures and a set of variables should be drawn up to assess the planning, implementation and improvement of these solutions in cities. Moreover, the papers about the rural/suburban areas, which are also impacted by the processes of urban sprawl and urbanization should also be included in the review. Omitting them if they were not formally parts of the city, would be incorrect. Therefore, the literature review did not omit papers that dealt with non-urban areas but those that were related to the city's resources management policies.

As a result of previous research, it was indicated that there are no criteria or a system of criteria that allows for an unbiased, complete description of resources management in a city in the age of sharing economy. After the identification of this research gap, filling it became the aim of this research. It was assumed that the research framework would consist of several areas connected with each other (see Figure 2). In the first place, the "resource" term was defined, resources were classified in the context of urban logistics, and an approach was selected that would allow for their description in a clear, legible and comprehensive manner. Secondly, the place, roles and functions of the sharing economy in the creation of urban logistics systems were identified. These solutions had to be classified (presented as groups of solutions) and the resources they use—indicated (one or more categories of resources). Both of the described steps were carried out at the stage before the main study and presented in Section 2. The third step (the main part) was the classification of the criteria for assessing resources management in the city logistics system in terms of implementing sharing economy solutions. This stage consisted of two elements: specifying the areas of assessment, and within those, individual criteria. This phase ran as follows.

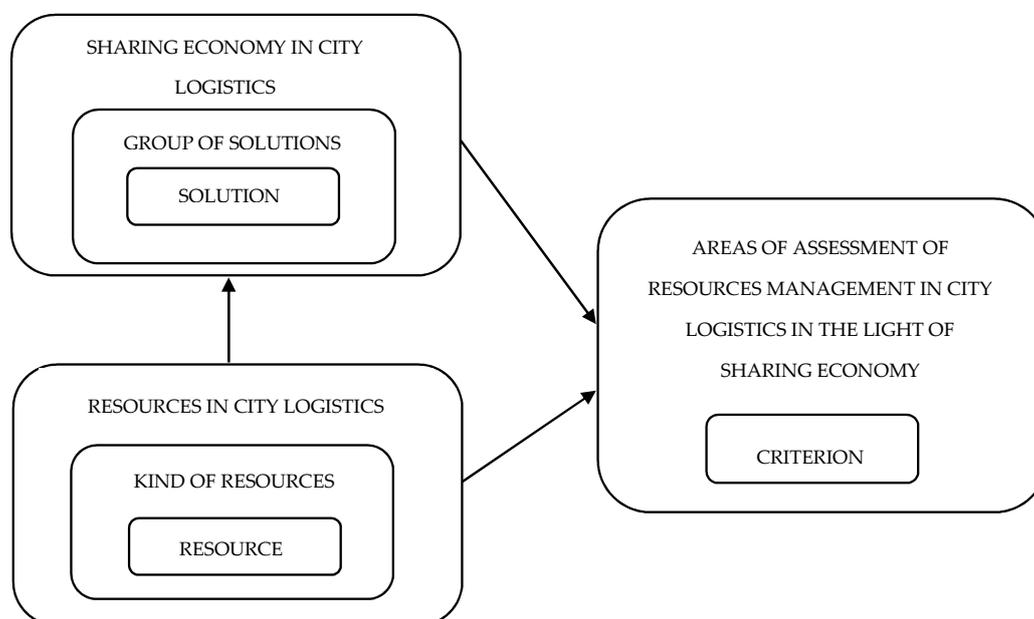


Figure 2. Research framework.

The semi-systematic literature review was adopted as the main method. In creating the procedure, several studies in the field of literature review in social sciences [102–104] and a few from the papers similar to this one [105–107] were used. It was decided to collect all the information concerning

resources described individually (the largest group of papers) and collectively. The following steps were adopted in the review procedure:

- Step 1. Defining the research problem for the literature review;
- Step 2. Defining the scope of searches (search engines: DOAJ, EBSCOhost, ScienceDirect, Scopus, Springer, additionally: Mendeley online);
- Step 3. Defining keywords and search logic (see Section 3.2);
- Step 4. Conducting search, creating a literature database (see Section 3.2);
- Step 5. Literature analysis (see Section 3.3);
- Step 6. Preparation of the study report (see Section 4).

3.2. Literature Search

This section further highlights steps 3 and 4 from the procedure steps (see Section 3.1). Firstly, similar research, according to the topic of the literature review, was identified [107–111]. The search itself was designed according to Rowley’s and Slack’s approach [104], improved by the approach of Snyder [112]. Primarily, it was aimed at building the theoretical model. It included searches in six search engines. The advanced search algorithms were used to refine the lists of literature sources with the keywords. The search criteria (with Boolean operators) included:

- “Resource*” in abstract (The asterisk mean different possible word endings appearing together with the core of the word, e.g., for “resource*” they can be “resources”, “resource-based”, “resource-related” etc.),
- AND “urban” OR “city” OR “town” OR “cities” in abstract,
- AND “sharing economy” in text,
- Only full-text records,
- Sources published in 2010 or later (because of the topicality of their research results),
- English-language sources,
- Only sources indicated as scientific (if the search engines provided such an opportunity).

The word “logistic*” was not used in the search because previously it was recognized that, in many cases, papers concerned freight transport or passenger mobility and they were elements of urban logistics system but not named as such. After reviewing the abstracts, part of the primary database was eliminated, and then the final set for content review was determined. Finally, 161 literature sources were accepted for a detailed review. Then, a conceptual framework was developed by use of the mind mapping to understand the relations between the concepts.

3.3. Literature Analysis

The primary concept map, mentioned in 3.1, was then improved into the criteria map presented in the Results part of the paper (see Section 4). They were scanning the sources allowed for grouping them into those related to particular kind(s) of resources and their characteristics, which should be assessed. In this step, the Microsoft Excel and Mendeley Desktop were used to refine the large amounts of text and indicate only those parts relevant for the purpose of this study. At this stage, it became evident that the final results would be divided into two main groups: those related only to natural resources and the remaining part.

As indicated by Snyder [112], a semi-structured review aims at detecting themes, theoretical perspectives or their components, resulting in mapping field of research (based on tracking development over time) and create an agenda for future research. In our case, the theoretical framework serves as the guideline for future interviews and surveys.

Within the main review itself, the kinds of resources described in the sources were firstly identified and then the criteria of evaluation of resources management were developed. Later, the relations

between criteria were identified and presented in graphical form with the use of mind mapping software (MindMup).

4. Results

While reviewing the literature, a few first results were visible without any detailed analysis. Firstly, the term “resource” is differently understood and described by the researchers themselves. The main division, which should be made, while initial, ad-hoc analysis, concerns natural and non-natural resources. Many literature sources mentioned the resources in urban areas as water, land, space (see Table 3). However, from the logistics point of view, which should be perceived as a holistic one, a city is a logistics system containing many different resources. According to the 5R rule, widely known in logistics literature, the right resources (characterized also by right quality) should be delivered in the right quantity, to the right place, at the right time, at the right (agreed) price [113]. Delivery of resources is a result of the needs of consumers and provides value for those addressees. Because their needs are various, perceiving the resources only as natural ones does not meet the requirements of 5R (e.g., in takeaway delivery, ride-sharing). The holistic approach should include all of the resources needed by consumers of goods and services. Secondly, in the literature, there is a very fragmented view of resources management, also in the context of sharing economy development. Most of the selected literature (and the search criteria were very wide) concerns only one or sometimes a few elements of resources management. They rarely describe the wider set of solutions or interdependencies, treating them as separate areas without any further consequences. This approach is not appropriate, while the urban logistics system should be treated as a whole, a system containing the interrelated components. Therefore, all of the resources identified in the literature were gathered, analyzed (see Table 3) and the relations between them identified (see Figure 3).

The biggest number of sources mention natural resources management, especially water management [114]. The others refer to not so popular approaches to see the city as a place for human resources management—e.g., social resilience, cultural ecosystem services, knowledge sharing and intellectual and cultural resources [28]. While those human resources are addressed in organizational management research, they are not explored in the urban environment. [115].

The data about the criteria gathered while analyzing the literature were very chaotic. The same criteria were defined differently or had different names (e.g., social structure, social values). Rarely the described criteria presented more than one area of resources management. Mostly, the selected papers addressed only one kind of criteria (e.g., only administrative, economic) or even single criterion (regarding especially land-related and water-related). Interpreting the definitions presented in all of the gathered papers was very demanding and often required very deep analysis of their texts. Therefore, the initial landscape of the criteria for assessing resources management in sharing economy in urban logistics was a very dispersed one. Only the one-by-one analysis of papers allowed for identifying the same resources and the same criteria for assessing managing them.

Most of the criteria can be treated as qualitative (except for a few economic ones, concerning, for example, costs). All 26 criteria can be divided into five areas (see Table 3): administrative (4 criteria), social (5), economic (9), technological/infrastructural (4) and environmental (4). The detailed descriptions of criteria are presented in Table 3; therefore, in this section, only the main findings are presented. The administrative criteria influence almost all other groups. Especially the legal issues, regulatory frames should be assessed since they constitute the operating conditions for private and public sharing economy solutions. They should be constituted mostly at a local level, but also at the national (e.g., taxation system for service providers) and even on a macro level (especially in the European Union, since some international associations (with varying degrees of integration) may regulate some spheres of economic life.

Table 3. Criteria for assessing resources management in sharing economy in urban areas.

Area of Assessment	Criterion (Subarea)	Lit. Sources	Resources Management—Short Description	General Kind of Addressed Resources	Sharing Economy Solutions Group
ADMINISTRATIVE	Constituting regulatory frames (regulating and licensing)	[19,23,45,46,116–125]	<p>Regulations should address most of the issues of resources management in sharing economy (most of the social elements of sharing economy are excluded), but in particular:</p> <ul style="list-style-type: none"> • Licensing system; • Rules for urban planning interventions (also land use); • Working conditions (according to labor law); • Consumer protection system; • Data protection regulations; • Insurance; • Other (anti-trust, anti-discrimination). <p>Regulation should both target sharing economy platforms but also their traditional competitors to encourage innovation and adoption of information technologies.</p> <p>They should be constituted at local, national and macro levels (e.g., EU-level).</p> <p>Governance gap can occur (technology development faster than regulation).</p>	All	All
	Development policies—public strategy	[45,115,116,119,120,123]	<p>Creating a public development policy (strategy or sustainable urban mobility plan; by local authorities) organizing the life of the city. The most popular are promotion and regulation, usually used together.</p>	All	All except financing
	Environmental policies	[6,9,17,19,46,120,122,124–128]	<p>Can be a part of development policy or a separate one. Include the regulations and recommendations about, for example, resilience for climate changes, limiting GHG emissions, use of energy, sharing of public resources.</p> <p>Access instead of ownership thus seems both sensible and resource efficient.</p>	Information Material	Mobility, spaces, health, municipal goods
	Co-governance	[6,22,25–27,40,41,43,44,51,52,54–57]	<p>Deciding democratically about the investments and solutions while city authorities are leaders (public consultation). Close collaboration with local authorities—essential for the fair allocation of the generated benefits within local communities—also based on collaborative consumption. Discussions and bilateral agreements on a series of issues: city taxation, local employment, investment in infrastructure, sharing assets, improving living standards.</p> <p>Includes collaboration of resources management between different groups of stakeholders, excluding the public ones.</p>	Human Money	Municipal goods

Table 3. Cont.

Area of Assessment	Criterion (Subarea)	Lit. Sources	Resources Management—Short Description	General Kind of Addressed Resources	Sharing Economy Solutions Group
SOCIAL	Social structure and network	[8,14,18,23,45,115–117,119,122,129–132]	<p>Usually, urban communities are very heterogeneous populations with a rich variety of relationship networks and governing mechanisms. The structure including different stakeholder groups and subgroups—e.g.,</p> <ul style="list-style-type: none"> • Small businesses (e.g., divided in different sectors); • Big businesses (e.g., divided in different sectors); • Individual city users (residents, guests, people working in the city, tourists etc.; people in particular age groups); • Local authorities; • Public transport operators; • Private transport operators (e.g., transport companies, shippers, carriers, 3PLs, 4PLs etc.). <p>This part should also include the relations between the groups and subgroups, such as their preferences, goals. The ways of managing the clash of conflicting interests and priorities in the urban space where the sharing economy primarily unfolds (trade offs).</p>	Human	All
	Social values	[6,45,116,129,130]	<p>Social values perceived as the priorities, trust to other people, trust to local authorities and other stakeholders, attitude to the possession and use of things, social and property status, etc. The efforts of the social enterprises (also sharing economy enterprises) have fallen short against conflicts between private profit and social values; so-called “pseudo-sharing” can be distinguished, by for-profit orientation, and the absence of feelings of being a part of the community. In some way, sharing economy is based on solidarity, and does not aim for profit. Private sharing stimulates more prosocial behavior</p>	Human	All
	Social interaction/ communication and information sharing	[6,8,28,45,115,116,119,122,123,126,130,133–139]	<p>Can also be called social communication, information sharing, social experience, activity, cohesion, resilience. It is a set of relations between peers in a peer-to-peer network, not between groups of peers (like stakeholders) but individual ones. A base for those is mutual trust and the idea of “shaping a warm city in terms of people’s heart.” Its tools are, for example, co-workings, community areas (e.g., gardens).</p>	Human	Municipal goods, learning/skills, utilities, general goods
	Human resources management	[23,115,120,140–142]	<p>Aimed at improving labor conditions, including talent management. It is especially important in developing countries where the informal economy is usually large, as are the structural inequalities and discrimination. Sharing economy seems to be accessible to all, but not where the digital exclusion is high. Most workers or “entrepreneurial consumers” have full-time jobs (also that are well-paying), but use the platforms to augment their income. Its tools can be, for example, e-learning, e-assessment, e-rewarding—eHRM.</p>	Human	Learning/skills

Table 3. Cont.

Area of Assessment	Criterion (Subarea)	Lit. Sources	Resources Management—Short Description	General Kind of Addressed Resources	Sharing Economy Solutions Group
	Intellectual capital of city	[115]	Includes creating, sharing and using knowledge stimulating city's renewal and growth. In urban communities, knowledge is often deeply anchored and affected by remote or recent history. In cities, change is typically a slow, gradual process determined by relationships between key stakeholders. There are four categories of city's intellectual resources: processes, people, market and renewal, and development. In this field, cities can be characterized by the level of creativeness, culture, entertainment, innovation, intelligence, learning, science, service, technology (also being smart) and artistic and historical heritage, as well as the success of the city's image strategy implementation Tools: active scientific, industrial and technology parks. In fact, it can be monetized, so can concern not only human and information resources but also money.	Human, information	Learning/skills
ECONOMIC	Economic framework	[8,17,115,117,119]	Competitive cities accumulate both intellectual and financial capital complementing each other, forming the "economic breakthrough conditions". However, financial incentives and market success important for businesses are less relevant in motivating urban communities. For them, more important can be quality of life, level of participation, identity and vision.	Money, human	All, but mostly financing
	Cost savings	[17,23,119,137,143]	Cost savings for different groups of stakeholders. Usually, they are presented for the cost of ownership, the unused capacity of means of transport, effective waste management and reusing resources. Tools: spreadsheets for calculating costs, applications and platforms for cost controlling.	Money, material	All
	Waste reduction	[15,17,122,128,135,143,144]	In sharing economy, it is possible to reduce different kinds of waste—e.g., the electrical and electronic equipment, end-of-life vehicles, their parts, or even usual municipal waste. Can be perceived partially as an environmental subarea.	Material	Mobility, general goods, municipal goods
	Additional income	[8,45,117,119,122,137,145]	Generating additional income for peers being service providers. Enabling the development of a permanent class of small business owners/partners, being or not serial entrepreneurs. Diversity of business models produces different kinds of income mechanisms.	Money	All, but mostly financing, except municipal goods
	Focus on local economy	[133,145–148]	Additional income for service providers should produce the tax income for local economy (depending on the taxation system in particular countries). If the practice includes monetary exchanges, they all directly benefit those involved so create a local economy. This means that the assets involved are highly specific to avoid opportunism by external stakeholders.	Money	All
	Accessibility	[8,117,133,137,145]	The practice strives to be open to all, and its identity is redefined as people join. Additionally, very important are the constant access to solutions and flexible capacity.	Material, information	All

Table 3. Cont.

Area of Assessment	Criterion (Subarea)	Lit. Sources	Resources Management—Short Description	General Kind of Addressed Resources	Sharing Economy Solutions Group
	Financial resources	[119,122,149]	The access to financial resources and their structure build the business model together. One of the areas within this field is the careful management of PPPs and financial loans because of political interests; the need for strict regulations and mechanisms to share the risk—a lack of them is a barrier.	Money	All, but mostly financing
	Use of capacity	[6,28,117,124,126,131,137,140]	Using the capacity of resources (their productivity), both physical and non-physical resources, coordinated and non-coordinated, in the ground and in the underground urbanization. An example can be using the capacity of spaces, such as park spaces, parks, water resources; in fact, all of the resources shared within the city, both public and private.	Material, information	All
	Insurance mechanisms	[46,119]	Insurance can be related to many issues in sharing economy: means of transport, drivers, whole companies, peers and investments. The barrier here is avoiding healthcare insurance by employers. Producers meet or exceed industry certification standards (including providing sufficient floor area to accommodate employees, ample parking, delivery vehicle access points, fire and plumbing safety and sanitation of internal operations, proper insurance coverage of building and other insurance.	Money, information	All, but mostly financing
	V-2-X communication	[147,150,151]	Preparing the system for communication between different objects, especially between vehicles and others, but also, for example, between apartments and houses with mobile devices (when flat-sharing systems)	Material, information	Mobility, spaces, health
	Real-time information sharing on IoT smart city platforms	[23,117,119,120,122,123,126,129,130,136,138,139,145,147,150–156]	The city (especially local authorities) should focus on building smart environments (with free wireless internet, online parking systems, online trip planning systems for planning routes and the use of means of transport, traffic control, commercial sharing platforms and public platforms. blockchain etc.) Additionally, tools for measuring the traffic can be, for example, congestion indices. Very important is avoiding information asymmetry.	Information	All except learning/skills and spaces
INFRASTRUCTURAL/ TECHNOLOGICAL	Data acquisition and processing	[23,45,46,117,119,124,127,137,138,140,147,152,157,158]	In this group the following practices and tools should be checked: mapping software tools to show online, real-time traffic updates, traffic flow damaged roads, accidents, SMS services for traffic updates. Those tools can help in maintaining road light and the signaling system and implementing policies to modernize the current traffic management, Various IT and software programming with flexible architecture (modular) for data acquisition from dispersed sources (cameras, phones, intelligent transport systems, drones, quad-copters, social networks, GIS and sensor networks, also for environmental monitoring). The IT should be made as a control tower, similarly to those ideas used in supply chain management (centralized data storage, processing and mining).	Information	All

Table 3. Cont.

Area of Assessment	Criterion (Subarea)	Lit. Sources	Resources Management—Short Description	General Kind of Addressed Resources	Sharing Economy Solutions Group
	Green infrastructure	[6,8,28,45,118,119,128,131,134,135,148,159]	Planning, building and maintaining green infrastructure in order to enhance the sustainable production of ecosystem services, but also all the services within the urban area. This group includes both the elements of technical nature: systems of green gardens, bike-sharing systems and other vehicle-sharing systems. Can be perceived as partially environmental.	Material	Mobility, spaces, municipal goods
	Water-related	[5,9,19,21,114,160–165]	The most popular in the resources management literature concerning urban areas. Includes practices such as: water recycling and reuse, water conservation, drinking water management, promoting modest water consumption among residents and other city users, stormwater storage, outdoor water-use restrictions, efficient irrigation. It can depend on climate, impact on agriculture.	Material	Municipal goods
ENVIRONMENTAL	Land-related	[9,17,19,114,117,119,124,134,148,162,163,165,166]	Land-use is very linked to water management, air management and law restrictions. It can be divided into residential, commercial and industrial ones, with different specifics and potential kinds of pollution. It influences underground urbanization and agriculture; of course also forests. Positive phenomena can be afforestation or reforestation; negative ones—urbanization, deforestation, desertification, floods and abandonment of agricultural land. More technologically and non-environmentally, it can concern integrated parking management programs, encouraging alternative transportation (park and ride solutions), improvement of non-districts, get the right people to the right parking space, and support and enhance economic activity. Additionally, it can include on-street strategies (parking space management programs) as follows: <ul style="list-style-type: none"> • Unregulated (typical of residential and suburban areas—e.g., may have a seventy-two hour limit to prevent car storage); • Time-limited (e.g., two-hour parking or loading/drop-off); • By time of day (e.g., hours of enforcement); • By permit (e.g., permit only); • By permit and time stay (e.g., two hours or by permit); • Priced (by hour, time of day, demand) using various technologies (e.g., meters, pay stations, pay-by-cell). It includes almost all issues of underground urbanization process—e.g., mining.	Material	Municipal goods, spaces
	Energy-related	[9,124,161,163]	Renewable and non-renewable, especially fossils, the energy efficiency of buildings and infrastructure, photovoltaics, the use of wind energy and underground (geothermal) energy.	Material	Municipal goods, utilities
	Air-related	[9,131,163]	Air quality testing system, air quality management policy, monitoring with use of sensors, avoiding of air pollution by reducing traffic—e.g., bike-sharing systems, climate changes, reduction in GHG emissions influencing the buildings on the temperature in cities.	Information	Municipal goods, utilities

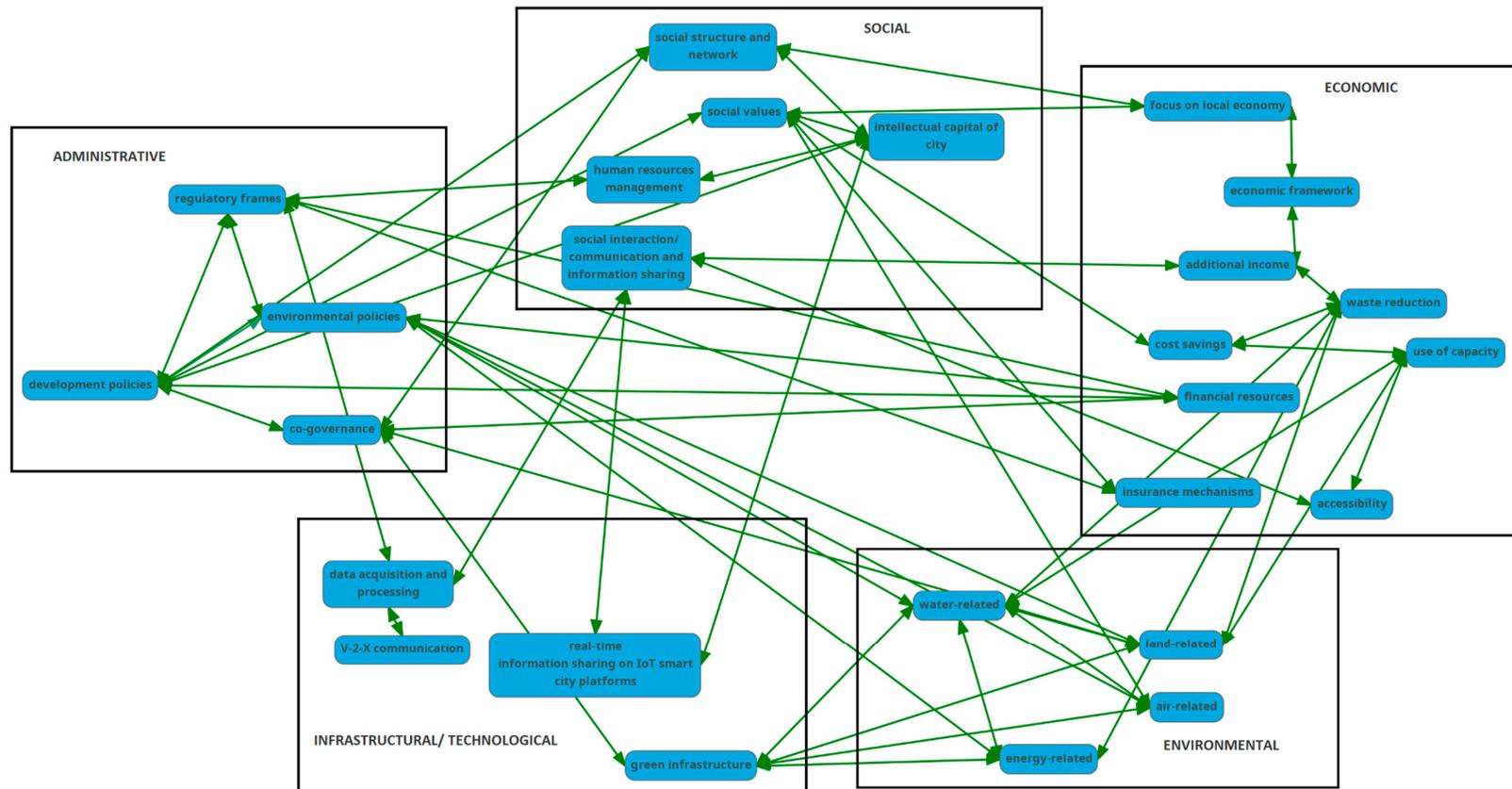


Figure 3. Suggested correlations (green lines) between criteria according to the literature review. Source: [5–166].

The other administrative criteria have various scopes of impact on resources management. Current local authorities' actions in many countries provide a wide, various scope of solutions for sharing economy development but not exactly for service providers. There is not only the governance gap reported in the literature but also the regulatory gap—no regulations at all. Cities, agglomerations and metropolitan areas create development policies and environmental policies to meet the requirements of sustainable development. Usually, development policy contains an environmental part (e.g., Sustainable Urban Mobility Plan), but in some specific circumstances (water shortage, unique climate, highly industrialized areas, high GHG emissions) there is a need for stronger focus on the environment. The next criterion was the co-governance, so participating in the local community in decision-making about the shape of the resources management. The scope of co-deciding is different in various cities, although is perceived as a good practice useful to address the needs of different stakeholders, individual, business and public ones, other than authorities (e.g., public transport companies). City residents and other users shape their own neighborhoods by disposing of the available resources.

Within the social group of criteria, a few subareas can be derived, focused on relations (social network, values, communication) and human resources (people and intellectual capital of the city). Among those, the literature addresses especially social structure/network and social interaction/communication. The plurality of names calling the same criterion is due to the different terminology used in the studied literature. The social structure is built from different stakeholders taking part in the life of the city—for example, co-governance—but not limited to it. Building the network from various groups of stakeholders willing to cooperate is very challenging, especially when they have the opposite aims. Then, the task of urban logistics is to prioritize them and agree on the tradeoffs. Social communication, including information sharing and other interactions, is a part of operating within the social network. Here, communication technology is also essential, so this is correlated to IT solutions and other technological ones. The aim of the sharing economy is to connect peers in reality, and virtually. Therefore, among the sharing economy internet platforms, the other forms of people integration are made (especially when managing municipal resources), such as co-workings, gardens and other areas.

Social values are essential to build a strong community and efficient logistics system, including the sharing economy solutions. Initially, sharing was aimed at promoting prosocial behavior, not aimed at generating profit. With time, the financial dimension of the collaborative consumption dominated the sharing economy. Therefore, some researchers call Uber-similar solutions, such as those representing the “pseudo-sharing” practices. The idea of real sharing should build the feeling of being a part of the local community. Therefore, the local authorities became the most important stakeholder in almost all the sources analyzed within the review.

The last two social criteria were human resources management and intellectual capital of the city. The description of the first was not clear in the identified papers. Nevertheless, it focuses mainly on reducing inequalities, discrimination and increasing interest in talent management by developing sharing economy initiatives. Again, the support for that is on internet platforms. On the other hand, developing the intellectual capital of the city concerns mostly knowledge management (also correlated to IT), but also refers to social values presented by, for example, artistic heritage, culture and development strategy.

The largest group of criteria has an economic character. In this group some further division can be made for a few subgroups: general (economic framework), strictly financial (cost savings, additional income, financial resources), indirectly financial (accessibility, use of capacity). Some of them can be related to other areas (waste reduction-to environmental criteria; focus on the local economy to social ones; insurance to social and administrative). First and foremost, the economic framework should be created (again, mainly by local authorities) not only to promote the financial incentives, by motivating more the prosocial behavior in the local community. This general guidance should specify the aims of the sharing economy solutions. Cost savings are primarily important for customers of sharing economy solutions (when they use shared resources, they do not bear the cost of ownership), but also

other groups (e.g., service providers who maximize the use of the capacity of resources). Getting additional income as a result of providing services is an obvious outcome of such an activity. They give access to some kind of mostly private resource—car, another vehicle, apartment, house, etc. In this regard, the regulatory framework is needed to avoid unfair treatment, especially of service providers (peers). The diversity of existing business models produces diverse income mechanisms (fixed hourly rates, commissions only, mixed models). Access to financial resources relates mainly to mechanisms of financing common goals, initiatives, sharing financial resources in order to implement investments, crowdfunding, various forms of PPP (public–private partnership). This subarea also needs appropriate legal regulations to promote fairly treating all sides of transactions.

Indirectly, financial criteria are strictly related to the capacity of resources. Firstly, the accessibility addresses the flexibility of access to resources. By definition, they should be available on demand. In practice, sometimes the issues with the constant access to resources occur (e.g., sharing apartments and tourist season, sharing cars and traffic hours, etc.). The higher the flexibility, the higher the demand for services offered by a given provider. In turn, maximization of used resources' capacity lies in basic assumptions of sharing economy. The primary reason for sharing resources, next to the lack of willingness to owe those resources and only to use them, was exactly using only some part of their capacities. In the case of cars, it was only a few percent. Therefore, it was justified to seek some solutions helping to increase it.

The economic criteria related to other areas of assessment are very few. Waste reduction is multi-dimensional because of the diversity of possible waste. The analyzed literature paid the greatest attention to the waste related to resources with very short product lifecycles, so mostly built of electronic parts, such as phones or vehicles. Nevertheless, this group is not limited to them because others derived municipal waste (clothes, shoes, food). The next criterion, the focus on the local economy is related to the economic condition of it. Sharing economy solutions should be focused on locally available resources and their capacities, contributing to the overall development of the region, and also its economic situation. Thus, they should be concentrated on providing services for the local community and, therefore, generating income and taxes. Finally, insurance is crucial for the safety of transactions and their possible results, especially in the case of sharing valuable private resources. This is discussable if this area should be regulated by some national or local authorities or be a part of the competitive advantage of given individual solutions. It is easier to provide the freedom to shape this aspect for individual service providers. However, some literature sources postulate the interference of the authorities in developing the conditions of insurance.

The core of sharing economy is the technology enabling sharing all of the kinds of resources. The digital era and the Internet of Things in this area address primarily data acquisition and real-time processing and sharing. Therefore, it was not surprising that the literature mentioned mostly those two criteria of the assessment the resources management in the area of technology. Firstly, gathering data from different sources is crucial to carry out those processes. Dispersed sources generate big amounts of data, which should be refined and relevant data selected. Then, those should be processed to obtain the needed results. Here, we want to present our view on that matter. We think that sharing economy platforms, which are focused on the discussed processes, should create a software analogous to the control tower in supply chains. Platforms are the integrators of different stakeholders, providers and customers (sometimes the same peers being both), and also the integrators of different data streams, so they should be equipped with the advanced tools allowing for big data analysis. Moreover, real-time data sharing is the core of the sharing economy platform. A smart city should have such a platform (provided by the municipality itself or private company) to manage sharing resources within the urban logistics system—both private and public.

Those strictly IT-related criteria are supplemented by the other two—green infrastructure and V-2-X communication. Green infrastructure means not only the public buildings and other sites (e.g., parks) financed by public entities but the ones set by private stakeholders, even if focused primarily on earning money. Green infrastructure helps not only to achieve goals of sustainable resources management but

also to improve resources management in the economic area, which is the focus of most of the service providers (except public ones). V-2X communication is inevitable in the age of the Internet of Things. Information sharing between objects allows for more efficient resources management—e.g., in the area of use, their capacity (remote control of the shared resource shortens the service provider's reaction time and accelerates the conclusion of the transaction). However, V-2-X communication is strictly a technical issue. Nowadays, the most popular kinds of such solutions are Vehicle-to-Vehicle and Vehicle-to-Infrastructure solutions. Those can also be based on the blockchain technology; although, for now, it is only in the initial stage of development.

The last identified area was related to the environment (more precisely: natural environment). The group of papers within the literature analysis in this group was very hermetic. As mentioned before, many papers considered the urban resources in a very narrow view as natural ones. Therefore, in Table 3, the group of sources assigned to that area was different from the ones mentioned for the previously presented areas.

Nevertheless, four criteria were derived in this area. The largest group of papers was focused on water management, combined, which is not surprising, with land use. However, the specifics of both are partially separable. Usually, water management focuses on the protection of existing resources, the way of their reuse and maintaining the current level of owned resources. Since water resources are becoming more and more scarce all over the world, cities suffer from their lack quite strongly. As the same water circulates within the city, it is a shared resource, even if not perceived as such in most of sharing economy literature sources. Therefore, managing water should be a part of assessing the urban sharing economy.

Similar reasons apply to land sharing, mentioned mostly as land use. The same land can be used by different urban logistics stakeholders even if it is obvious, and no one thinks about it, treating this fact as obvious and irrelevant. It should be very related to green infrastructure and co-governance since sharing it relates mostly to land owned by local authorities. A core element of land use is managing space, especially parking space, which can be regulated or not. Less important, but gaining more interest in cities without free space, is managing the underground urbanization.

Managing energy is very focused on local natural resources and their energetic potential. It can be related to water management if the energy is produced by the water power plant. Special focus in cities should be put on renewable resources producing energy—even if not now, then having the potential to do it (photovoltaics, the use of wind energy, geothermal energy). In this context, focus on the energy efficiency of new buildings and improving it in the case of old ones (modernization) is significant.

The air-related criterion is gaining popularity among cities around the world. The quality of life depends on the quality of air. Therefore, all of the issues mentioned here should be included in a legal document—e.g., the city's environmental policy.

The criteria within presented ones as presents Figure 3 should or can be correlated with each other. This needs further verification. Those correlations show the interdependencies between the actions of different stakeholders, especially local authorities and the group of remaining ones (residents, tourists, workers, transport companies, small and medium entrepreneurs, big ones from different sectors, etc.). Within those, some more probable correlations can be derived since they were mentioned in the analyzed papers. Firstly, as mentioned before, administrative criteria can correlate mostly with social and economic ones. The map of potential correlations can help to design the empirical study based on this extensive literature review. They should be verified, and after this step, they could be used to build the latent variables or even the regression models for assessing the resources management in sharing economy in urban logistics.

5. Discussion

The concept of sharing has existed for centuries but has recently developed more, mostly because of the influence of digital technologies' growth. Many sources, mentioned in Section 2, concern the relations between sustainability and sharing economy. Indeed, they have common areas. However,

the core of those definitions are resources, and the main area of implementing the innovation are cities. Most of the sharing initiatives take place in the cities and that is why municipalities are made to redefine their strategies in management and cooperation with other stakeholders. Various benefits of sharing go beyond enhancing the use of idle resources. To make sharing more economically, socially and environmentally effective, new regulatory and monitoring mechanisms should be applied, taking into account resources' management. The results presented in the paper allowed the authors to gather and analyze the whole set of criteria concerning resources management in sharing economy in cities.

The comparison of the results with the already published papers will be provided, but worth noticing is the fact that the approach where resources mentioned as the whole set of the resources within the sharing economy in cities was not applied before. Usually, the authors of the analyzed literature items focused on the chosen resources, but most often only on the natural, ICT or only on sustainable ones (mentioning economic, social and environmental). Additionally, in the identified literature, the chosen criteria are indicated as dedicated to the special group of stakeholders who should manage them. According to this approach, municipalities are presented as a group responsible for resource managing in administrative [167,168], social [169] and—most often—environmental [170,171] dimensions. Private stakeholders, most often the providers of the sharing solutions, are those who should be interested in the economic [172] dimension of resource management, as well as for the infrastructural and technological side of the initiatives [173,174].

The result of the literature review was the identification of differences in defining resources and criteria. It was not surprising, since it is usually a result of almost every review. However, the scope of those differences was very wide and caused difficulties in building a unified approach to resource management. Another result was that usually the resources management was described only for the chosen groups of resources even if the authors mentioned the holistic approach to resources management in urban logistics. It has to be clearly stated that only the holistic approach can lead to valuable conclusions for sharing economy in urban logistics. A very dispersed network of stations, employees and other kinds of resources requires managing the whole city and even the suburban areas. Therefore, the peculiarities shown in this research for the studied topic should be some kind of warning to future researchers.

The methods for managing all the resources efficiently should be discussed here, which indicate that such a thing is impossible. Many tradeoffs between the goals of managing different resources and tradeoffs between the goals of the stakeholders will occur, and some compromises have to be made, especially when the natural resources are scarce or under the risk of being such, because mostly they are not renewable. It has to be stated that the resources should be seen as a combination of those two approaches since all those resources can be shared but are not renewable.

The main advantages of the presented paper can be listed as a holistic approach related to analyzing resource management issues in sharing economy initiatives in cities, multiple methods applied in the research process, and additionally defining criteria for assessing resources management in sharing economy in urban areas.

6. Conclusions

The chaos of the different definitions of the same things occurs—digital city, smart city, sustainable city, circular city, etc. The same definitions for the different terms cause the blurring of ideas of managing resources efficiently. The pursuit to achieve this consists of recognizing the kinds of resources and the ways for improving this management. One of them is the sharing economy, and helping, for example, by using the (near) full capacity of them. Additionally, supply–demand systems in different sectors, such as energy, transportation and telecommunication, are the subject of dynamically spreading technological transformations—e.g., Internet of Things. Usually, supply–demand systems involve actors producing and consuming resources, and they should be regulated such that supply meets existing (or forecasted) demand, or demand meets available supply. Mismatches in this regard

may increase operational costs, can cause substantial damage in infrastructure (e.g., temporary power blackouts), and may lead to social instability (e.g., security threats) [151].

Very few papers covered the empirical analysis of many kinds of resources, which should be managed by different stakeholders within urban logistics system. Actually, no paper was found which included the whole scope of resources management in the field of sharing economy. Therefore, this paper extends the literature by presenting the full view not only of the resources being managed, but also the criteria for assessing this management. Then, to some extent, the mentioned literature gap was filled.

This paper has a few possibilities for being applied by different urban logistics stakeholders. As mentioned earlier, the most important ones in this regard are local authorities responsible for creating the right conditions for the development of the local economy and creating innovations. Moreover, improving the quality of life of residents became, a few years ago, one of the main purposes of authorities' actions; therefore, sharing economy solutions should be a key point of urban development policy. Then, local authorities in different cities and in different countries will benefit the most from the results of this study. Assessing the sharing economy system in their own city will provide suggestions about what has to be improved and what should be included in the actions of particular city authorities. However, the residents can also monitor the actions of local government in the area of sharing economy using the set of criteria presented in this study. The other stakeholders—e.g., service providers (both public and private)—are less impacted by the results of this study. However, they can also assess their services to check if they meet the requirements set for those kinds of services.

Despite the strong points of this research, it has a few limitations. Firstly, as always in the literature review, this study could omit some important and significant papers—e.g., about Sustainable Urban Mobility Plans. We tried to set the search criteria used in this study as wide as possible to allow for extensive literature review, but there was a risk that some of them could be not found. Therefore, in the next study, we plan to analyze the SUMP's in this field. The analysis of the SUMP's will allow for identifying all the important management areas from the perspective of the local government and residents. Secondly, this study is only an initial recognition of the resources management in sharing economy in urban logistics, and should be further developed—e.g., by creating scales for measuring the particular criteria and their subcriteria (especially required in the administrative layer, but not limited to it). This builds the next research gap, which will be addressed by the authors in the subsequent studies—assessing the importance of particular resources for different stakeholders, including the local authorities. This will also allow for the verification of the proposed correlations between the presented criteria.

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