

IC-SHARE 2024

International Conference on Sharing Economy and
Contemporary Business Models: Theory and Practice

May 10th-11th, 2024 Belgrade





IC-SHARE 2024

Belgrade, May 10-11, 2024

**Proceedings of the first International conference on
sharing economy and contemporary business models:
Theory and practice**

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FOREWORD

We are honoured to present the Proceedings of the first International Conference on Sharing Economy and Contemporary Business Models: Theory and Practice (IC-SHARE 2024). This landmark event marks a significant milestone in the field of sharing economy research, bringing together a diverse cohort of esteemed scholars and industry practitioners.

The Conference aimed to dive into the research fields encapsulating the concept of the sharing economy (platform and gig economy, collaborative economy and consumption, on-demand economy, mesh economy, access-based economy, P2P economy, etc.) from theoretical and practical perspectives. We believe that the Conference served as the gateway to the range of sharing economy topics surging in popularity encompassing the academia, policy-makers and the general public; altogether shedding the light on the impact of sharing economy practises and the dire need to foster the capacity of the sharing community.

The conference attracted 41 distinguished researchers and professionals representing 9 countries, culminating in 36 meticulously crafted contributions. These scholarly works, encompassing a wide array of topics within the field of sharing economy and innovative business models, have undergone a rigorous peer-review and revision process to ensure the highest standards of academic excellence.

The Conference proceedings covers 14 distinct themes, showcasing the wide range and complexity of studies featured at the conference:

- Advanced data analytics in the sharing economy
- Behaviour of users in the sharing economy
- Regulation and policy of the sharing economy
- Sharing economy business models
- The role of trust in sharing economy
- Crowdfunding and financial aspect in the sharing economy era
- Sharing economy and smart cities
- Sharing economy in transportation, tourism and hospitality
- Learning, sharing knowledge and education in the context of sharing economy
- Managing human resources in sharing economy
- Sharing economy in transportation, tourism and hospitality
- ICT-enabled sharing economy
- Security, privacy and application of blockchain in the sharing economy
- Sharing economy and sustainable development

Our heartfelt gratitude extends to our distinguished keynote speakers: Professor Shaul Shalvi, PhD - Amsterdam School of Economics, Professor Vadim Grinevich, PhD - University of Bradford, School of Management, Assistant Professor Jovana Karanović, PhD - Rotterdam School of Management, Erasmus University and Božidar Vlačić, PhD - Católica Porto Business School.

We greatly appreciate respected Editors from the journals Technovation (prof. Wim Vanhaverbeke, PhD and ass. prof. Ching T. Liao, PhD) and International Marketing Review (IMR) (prof. John W. Cadogan, PhD) for demystifying the submission process and offering invaluable advice on crafting impactful manuscripts.

The Organizing and Program Committees hereby express their profound gratitude to the Science Fund of the Republic of Serbia, along with all partners and contributors whose support was instrumental in realising this conference. We extend special recognition to the reviewers for their role in ensuring the quality of this publication. Our deepest appreciation is reserved for the authors and presenters, whose scholarly contributions have been pivotal to the resounding success of IC-SHARE 2024.

Belgrade, 9th September 2024

Milica Maričić, PhD

Veljko Jeremić, PhD

Nikola Zornić, PhD



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Table of Contents

Exploring Guest Preferences: A Focus Group Study on Airbnb Accommodation Attributes Ignjatović, Marina; Bojkovic, Natasa; Zornić, Nikola; Kuč, Vukašin	1
Online labor platforms and taxation: A scoping review Vukmirović, Valentina; Spasenić, Željko; Milosavljevic, Milos	6
Sharing Economy Index: How Can it Be Altered? Maričić, Milica; Uskoković, Veljko; Drinjak, Nikola; Panzaru, Emil	11
Segmentation of ride-sharing consumers: The case of BlaBlaCar users from the Republic of Serbia Golubović, Teodora; Maričić, Milica; Drinjak, Nikola	16
Preferences of Gen Z towards using sharing economy platforms in the fashion industry: Evidence from Serbia Rajković, Teodora; Maričić, Milica; Nikolic, Dejana; Lečić-Cvetković, Danica	21
Crowdfunding In Serbia: What do We Know So Far? Tepavčević, Aleksandra; Veljkovic, Jelena	26
Unveiling the Green Potential: Exploring Sustainable Value Creation in Serbia's Sharing Economy Stanimirovic, Petar; Borozan, Tea; Petrović, Dejan	31
The Role of Trust: The Cornerstone of Sharing Economy Services Brkljač, Milan; Sudarević, Tomislav; Marić, Dražen	37
Trust Dynamics: Shaping Trust in User Reviews Within Serbia's Sharing Community Nikolić, Mina	42
Crowdfunding and Entrepreneurial Drive: A New Paradigm in the Sharing Economy Borozan, Tea; Đorđević, Anđelija; Stanimirović, Petar	47
Navigating the Gig Economy Landscape: Assessing Methodological Challenges through the Lens of Gigmeter™ Radonjić, Ljubivoje; Anđelković, Branka; Jakobi, Tanja; Kalinić, Zoran; Ivanović, Vladan; Milošević, Marko	53
A trade-off between negative externalities and performance in the sharing economy Meggiorin, Katia	58
Institutional Work of Sharing Platforms and Incumbents in Brussels: Comparing the Ride-Hailing and Hospitality Industry Distelmans, Michael; Scheerlinck, Ilse	64
Experience in implementation of Internet of Things technologies in management practices: from optimization to innovation Shumyliak, Lillia	69
Sharing Systems in Urban Mobility Senić, Danijela; Mirović, Valentina; Mitrović Simić, Jelena	75
Reducing Transaction Costs of Epistemic Recognition through Online Platforms: Empowering Marginalised Academic Communities to Challenge Epistemic Injustice Ilbiz, Ethem; Akbar, Yusaf; Tracogna, Andrea	81



Mapping Sharing Economy Landscapes: A Segmentation Analysis of World's Cities Veljkovic, Jelena; Tepavčević, Aleksandra	86
Application of blockchain in the sharing economy: Use case of ride-sharing platform Mitrović, Dušan; Minović, Miroslav; Milovanović, Miloš	91
Serbian Gen Z and the Gig Economy: Unveiling Perceptions and Motivational Factors Drinjak, Nikola; Živković, Danica; Ignjatović, Marina; Komazec, Stefan	96
Airbnb in Academic Focus: A Bibliometric Analysis of Research Trends and Author Productivity Jovanović, Vuk; Zornić, Nikola; Marković, Aleksandar	101
Enhancing Trust and Security in Peer-to-Peer Transactions through Blockchain Technology: A Comprehensive Exploration Antić, Katarina; Milosavljević, Katarina	106
Unveiling Crucial Factors Shaping Ridesharing Usage Intention: Insights from Serbia Živojinović, Tanja; Zornić, Nikola; Petrovic, Marijana; Marković, Aleksandar	112
Unlocking Opportunities for Logistics Operators: An exploration of the sharing economy in automotive industry Raković, Kristina; Petrovic, Marijana; Živojinović, Tanja	117
Backer Profiling: What Drives Engagement in Crowdfunding? Uskoković, Veljko; Živanović, Milutin; Ribić, Maja; Janjić, Jovana	122
Farm to Fork Initiative Towards Sharing Economy in Serbian Agriculture: A Case Study of Farmit Startup Čudanov, Mladen; Pavlović, Sava; Jovanović, Lazar	127
Navigating the Landscape of Sharing Economy: Servitization-based Business Model Innovation Đorđević Tomić, Anđelija; Stošić, Biljana; Milutinović, Radul	132
Sharing economy value perception and employees' workplace satisfaction in co-working spaces Kovačević, Ivana; Anđelković Labrović, Jelena; Jovanović, Milica	138
Attitudes of Young Engineering Students Towards Sustainable Transport and Its Infrastructure Petrović, Luka M; Bjelica, Dragan; Pamučar, Dragan	143
Profiling Shared Accommodation Users: A Segmentation Study of European Countries Babić, Aleksandra.....	147
The Link Between the Psychology of the Leader and ESG Influenced Business Models in Family Businesses Milos, Luli; Jeremić, Emilija	152
Implementing a smart city in a developing country: The case of Guatemala City Juárez Brenner, José Rodrigo	158
The Power of Sharing in Disaster Management: Insights from a Bibliometric Review Radaković, Jelena Andreja; Petrović, Nataša	163
Towards Sustainability: A Quintuple Helix Approach in the Circular Economy Framework Petrović, Nataša; Lazović-Lønningen, Aleksandra	168



Shared Urban Mobility as a Part of Shared Economy

Slavulj, Marko; Vidan, Luka; Slavulj, Aurora 174

The digitalization of the social economy: The case of the city of Barcelona

Rodríguez, Nuria Vega; Espelt, Ricard 179

Examining the Sensemaking Process of Economically Vulnerable Groups in the Sharing Economy Context

Ramadan, Nora; Hassan, Mohamed; Filipović, Jelena; Micevski, Milena 184

Exploring Guest Preferences: A Focus Group Study on Airbnb Accommodation Attributes

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Abstract. *This research paper examines the hospitality industry, which was significantly transformed by the sharing economy, focusing on peer-to-peer accommodation platforms like Airbnb. Through a study involving a focus group of 13 students, we aim to determine the hierarchy of accommodation attributes valued by guests in this new era of travel. The paper meticulously analyzes 14 potential attributes, ranging from the type of accommodation to host communication, and evaluates their relevance based on guest preferences. Our findings highlight that the type of accommodation, cleanliness, location, and overall rating emerge as principal considerations for guests, shedding light on the nuanced expectations within peer-to-peer accommodation. This study contributes to a deeper understanding of consumer priorities in the sharing economy and provides strategic insights for hosts and platforms striving to enhance guest satisfaction and competitive advantage.*

Keywords. *Sharing economy, shared accommodation, Airbnb, focus group.*

1 Introduction

The intersection of the hospitality industry and the sharing economy has redefined how people travel and experience accommodation. It is not an exaggeration to say that the hospitality industry has undergone the most significant transformative shift of all economic sectors with the advent of the sharing economy. Traditionally dominated by hotels and resorts, the landscape is now populated with diverse platforms and services facilitating accommodation sharing, creating new opportunities for hosts and guests. Guests can enjoy personalized experiences while usually having more affordable accommodation options than traditional industry offers (Guttentag, 2015). Hosts can easily offer their spare properties on the market, turning them into a source of income. The accommodation choices have been diversified beyond traditional short-term rental of various lodging units to co-living spaces offering unique experiences and encouraging community and connectivity among travellers.

Out of a certain number of platforms operating in the accommodation sector on a peer-to-peer model, Airbnb stands out mainly for its global presence and diverse accommodation options. As the company's value increased, it became one of the most prominent players, profoundly impacting the sharing economy world. According to the statistical data, there are over 5 million Airbnb hosts worldwide and over 7.7 million active listings on the platform (Airbnb, 2024). To stay ahead, the company and hosts should navigate the evolving requirements and service quality standards imposed by guests. Thus, the attitude towards the inherently different service attributes must be continuously monitored and explored.

Recognizing that not all service attributes are equally important to (actual or potential) guests, this research aims to identify high-priority areas that require attention. As these attributes are related to the platform and hosts' service, their identification facilitates strategic decision-making for both platforms and their registered hosts. Understanding customer expectations and what matters the most is the foundation for attracting guests and successful peer-to-peer transactions. The paper proceeds with a literature review followed by a focus group study, presenting and discussing the findings. In the last section, concluding remarks are given.

2 Literature Review

Shared accommodation has been a stimulating topic for many researchers (Drinjak et al., 2023; Maričić et al., 2023; Maricic et al., 2023). Existing academic research and scholarly articles that focus on Airbnb service attributes identification and prioritization brought many valuable conclusions. Some of the most relevant studies and findings are listed below.

Ding et al. (2023) analyzed online reviews under Airbnb listings to develop relevant attributes. A total of 21 topics were identified and classified into the following dimensions: facilities, service, location, value, and general experience. The study highlights how people prioritize these topics concerning chosen property types and price ranges.

Comparing Airbnb to hotels, Sánchez-Franco and Aramendia-Muneta (2023) have identified key topics influencing guests' (dis)satisfaction. Their results indicate the differences in prioritization of crucial topics – while hotel guests highly value facilities and staff professionalism, Airbnb guests prioritize staff recommendations and proximity to tourist attractions. The specificities of Airbnb service quality dimensions concerning those offered by hotels were also discussed by Sun et al. (2019). In this study, the authors emphasized the importance of the following attributes: accuracy, cleanliness, rooms and facilities, location, personalized service, and authentic experience. Most attributes are more complex in Airbnb than in the hotel industry. For example, personalized service includes timely communication and check-in arrangements before arrival, unlike in hotels where this and other service attributes are evaluated only upon arrival.

Jaka and Helgadóttir (2016) found that perceived hospitality and service are the most influential factors for the satisfaction of Airbnb guests, having an advantage over physical amenities and the property's location. By the term "hospitality and service," the authors refer to several sub-dimensions like personality and empathy of the host, tangibles provided by the host, local knowledge sharing, responsiveness, reliability, and easy check-in and check-out. Similarly, the study of Ju et al. (2019) emphasizes that the service-related attributes can be associated with 1) hosts (like friendship, caring, kind behavior, provided photos, etc.), 2) accommodation facilities, and 3) website/platform (like information quality or transaction experience).

Some authors provided valuable insights into service and product attributes. Nawi et al. (2019) studied the effects of the physical environment, that is, ambience, decoration, and layout, on customer behavioral intentions; Fagerstrøm et al. (2018) and Fagerstrøm et al. (2017) investigated the impact of personal profile image of hosts on rental rate, while Edelman et al. (2017) warn of a significant influence of both hosts' and guests' race on Airbnb transactions.

When it comes to the applied methods, although there are examples of field experiments (e.g., Edelman et al. 2017), the exploration of online reviews under Airbnb listings using big data and text analysis is the most represented. Ding et al. (2023) used a big data technique, namely structural topic modelling, to identify crucial topics. Sánchez-Franco and Aramendia-Muneta (2023) used improved text mining techniques to extract relevant topics. Ju et al. (2019) explored a mixed-method approach. They utilized content and sentiment analysis and then conducted an online survey to relate customers' expectations to Airbnb's performance.

In summary, different methods have been demonstrated to extract information of interest from online reviews, implying that analysis of the existing users prevails over the analysis of potential ones.

3 Methods and Results

This study serves as a pre-research phase for the prospective conjoint analysis we aim to conduct. To provide feedback on this topic and insight into the Airbnb guests' comprehension and behaviour, we performed the study on a focus group of 13 students at the University of Belgrade's Faculty of Organizational Sciences in the first half of December 2023. The results of the focus group research are presented in Table 1.



Table 1. Proposed attributes mean rank and attribute levels acceptance rate (Source: Authors' work)

Mean rank	Attribute	Level	Acceptance rate
1.62	Type of accommodation	Entire accommodation unit	100%
		Private room with private bathroom	92.3%
		Private room with shared bathroom	38.5%
2.92	Cleanliness rating	4.8+	100%
		4.5 to 4.79	92.3%
		4.0 to 4.49	38.5%
		Below 4	0%
3.08	Location	Up to a 15-minute walk to the city center (or other locations of interest)	100%
		15 to 30-minute walk to the city center (or other locations of interest)	92.3%
		More than a 30-minute walk to the city center (or other locations of interest)	30.8%
3.92	Overall rating	4.8+	100%
		4.5 to 4.79	100%
		4.0 to 4.49	84.6%
		below 4	0%
6.23	Photo presentation	Accommodation is photographed in detail (all rooms and additional facilities are clearly visible)	100%
		Accommodation is partially photographed	61.5%
		Accommodation is insufficiently photographed	15.4%
8	Host communication and availability	Host responds within 1 hour	100%
		Host responds within 24 hours	69.2%
8.31	Additional facilities	Basic (Wi-Fi, air conditioning)	92.3%
		Standard (Wi-Fi, air conditioning, kitchen, TV)	100%
		Luxury (Wi-Fi, air conditioning, kitchen, TV, swimming pool/jacuzzi, etc.)	100%
8.46	Check-in time	Possibility of check-in from 14:00 to 20:00 (limited time)	92.3%
		Check-in at any time after 14:00	100%
8.62	Number of guest reviews	Up to 5 reviews	15.4%
		6 to 25 reviews	69.2%
		26 to 50 reviews	92.3%
		Over 50 reviews	100%
9.62	Cancellation policy	Free cancellation up to 24 hours before the stay	100%
		Free cancellation up to 5 days before the stay	100%
		50% charge in case of cancellation	30.8%
10.31	Host reputation	Not a Superhost	53.8%
		Superhost	100%
10.31	Size	Up to 12 square meters	46.2%
		12 to 30 square meters	92.3%
		Over 30 square meters	100%
11.46	Parking availability	Free parking	100%
		Parking with extra charge	46.2%
		No parking nearby	53.8%
12.15	Minimum stay	At least two nights stay	61.5%
		No limitations	100%

Based on the previous literature, examples of good practice, and the study of Airbnb accommodation, we have extracted the set of 14 possible attributes of accommodation that are likely to be important to guests. The attributes include Type of accommodation (entire unit, room with a private bathroom, room with shared bathroom), Location (distance from the city center or other location of interest), Overall rating (by other guests on a scale of 1-5), Cleanliness rating (by other guests on a scale of 1-5), Photo presentation, Host communication and availability (responding to messages frequency), Check-in time (limited 14-22 or not), Size (square meters), Additional facilities (Wi-Fi, air conditioning, kitchen, TV, swimming pool/jacuzzi, etc.), Parking availability, Host reputation (Superhost or not), Cancellation policy (free cancellation within a certain period or not), Minimum stay (defined minimal number of nights for booking or not), and Number of guest reviews.

The focus group participants were initially asked to rank the set of potential accommodation attributes by relevance from their standpoint. Table 1 first presents the attributes sorted by the mean rank, calculated as the average rank provided by all the participants in the focus group research. The focus group found the Type of accommodation to be the most important attribute when choosing accommodation, with a mean rank of 1.62. It is followed by Cleanliness rating, Location, Overall rating, Photo presentation, etc. We foresee extracting a condensed set of 6 to 7 attributes from this list for subsequent conjoint analysis. The most eligible candidates are the first seven attributes from the list sorted by the mean rank. However, deeper analysis is indispensable to probe this subset.

We have further examined the levels for all the potential attributes of the pre-research for the prospective conjoint analysis. The levels are also extracted from the previous literature, examples of good practice, and the study of Airbnb accommodation. We asked the focus group participants to declare whether they found each level of the attributes acceptable when making the reservations. The results of the acceptance rate for each level, calculated as the percent of focus group participants that find the given level acceptable, are presented in Table 1. As can be seen, levels of the first five attributes have various spectrums of acceptance. For example, regarding the location, up to 15-minute and 15 to 30-minute walk to the location of interest have an acceptance rate of 100% and 92.3%, respectively, while more than 30-minute walk has an acceptance rate of no more than 30.8%. This attribute is likely to be included in the prospective conjoint analysis. Still, it is to be discussed whether to leave all three proposed levels or merge the first two levels and present two levels in total to future study participants: up to 30 and more than 30 min walk to the location of interest. Host communication and availability, Additional facilities, and Check-in time do not vary much across levels. It might be considered to exclude these attributes from future analyses, even if they were highly important to the focus group participants.

It is interesting to note that both the Cleanliness and Overall ratings are highly important to the focus group participants. Photo presentation, for example, was not expected to gain such a high rating, while accommodation Size gained a less-than-expected rating.

4 Conclusion

To better understand customer expectations and determine the most crucial factors in deciding on accommodation, we conducted a study with a focus group of 13 students as a pre-research phase for the prospective conjoint analysis. Drawing on previous literature, examples of good practices, and a study of Airbnb accommodations, a set of 14 potential accommodation attributes was tested. Our findings indicate that the accommodation type plays the most important role, followed by cleanliness rating, location, overall rating, photo presentation, host communication and availability, and the number of guest reviews. Numerous studies have found that Airbnb users who stayed at different types of accommodations have varying practical needs. Guests staying at an entire property generally require more interactions with hosts throughout the whole stay, while those at the shared property, who can interact with other guests, rely less on the host but expect timely communication mostly during check-in (Ding et al., 2023). Surprisingly, the photo presentation exceeded anticipated ratings, whereas the accommodation size received a rating below expectations, especially with guests who prefer the entire property (Han & Yang, 2021). When queried about the acceptability of each attribute level during the reservation process, the first five attributes showed various spectrums of acceptance. Attributes with the highest rank and significant differences in the acceptability of different levels of attributes are the most suitable candidates for further testing that we plan to conduct using conjoint analysis.

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Online Labor Platforms and Taxation: A Scoping Review

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Abstract. *Online labor platforms have been disrupting the landscape of employment in recent years. The efficient model of taxation of this new employment model has, however, lagged. This paper aims to provide an early scoping review of the literature on the taxation of online labor platforms. When observed through the stakeholder point of view, we see that cross- and transnational, government-to-platform, and platform-to-employee relationships are the only topics examined so far. This paper can serve other scholars in navigating their investigations related to the taxation of platform work.*

Keywords. *taxation, online labor platform, scoping review*

1 Introduction

Digitalization has been accelerating the change in employment business models across the globe in the last few decades. As a part of the so-called gig or sharing economy, novel employment models are usually based on independent contractors providing personal paid service to other parties via online platform-run intermediates. This advent of such online platforms is praised by scholars as one of the most significant economic novelties in this century (Van Dijck, 2018) particularly in low- and middle-income countries (Graham et al., 2017).

Recent works on the online labor platform ecosystems usually put upfront stakeholders such as gig workers, job requesters, and platforms – as first-tier actors – and unions, activists, rival platforms, labor regulators, and investors – as second-tier actors (Keegan & Meijerink, 2023). Oddly, revenue services and tax administrations are not recognized as important parties in the ecosystem.

Nonetheless, the research on the interplay of taxation and online labor platforms has been steadily developing over time, both as empirical and theoretical works: [1] When it comes to empirical studies, a scholarly body of knowledge has been developing around different aspects of OLP taxation. Most common are papers addressing the regulatory environment and the status of OLPs considering the legal aspect and publications focusing on the adaptation of concurrent tax systems to the one required by the worldwide digital transformation (Harpaz, 2021) and potential tax evasions in real online labor platforms (Mill & Schneider, 2023). Another important stream of research is the one focusing on the best international practices in OLP taxation, whether through the lens of failure to regulate the platforms (Collier, Dubal & Carter, 2017), examining the flexibility of tax regulations for unconventional forms of employment to include gig workers (Black, 2020), or by focusing on potential “tax dodging” (Wood, Graham & Anwar, 2019). Even some very narrow-focused research advances our knowledge of the effects of taxation on OLPs, such as the impact of taxation changes on the intended labor supply on OLPs (Mol & Molho, 2024), and the potential of OLPs to play a role in collective bargaining (Ilsøe & Larsen, 2023). [2] The underlying theories have been developing at the same pace as the empirical studies. Some of the seminal papers isolate the main theoretical models to analyze the effects of taxation in the digital economy (Bacache et al., 2015). Other papers conceptualize the gig economy which allows for further classifications and regulations (Koutsimpogiorgos et al., 2020).

Even though the body of knowledge on taxation in the realm of online labor platforms has been rapidly developing, high-quality reviews are still a scarce resource. This paper aims to fulfill this lacuna and provide a scoping review of the taxation of online labor platforms. For this purpose, we have browsed

the Web of Science (WoS) core collection and isolated papers dealing with this topic. Accordingly, we have systematized the concurrent knowledge and provided some recommendations for further development of this research field.

The remainder of the paper is organized as follows. Section 2 explains the methodology of the scoping review. Section 3 dissects the main findings. Section 4 contextualizes the results, elaborates the main contributions and implications, and draws conclusions.

2 Methods

In our most recent study (Vukmirovic, Spasenić & Milosavljević, 2023), we presented a comprehensive bibliometric analysis of the OLPs explaining how various aspects of this emerging form of labor engagement are researched from various academic points. The current study offers a further contribution to the scholarly landscape on OLPs with the modification of the focus on the taxation aspect of OLPs. We applied a similar methodology approach as in Vukmirovic, et al. (2023) utilizing the comprehensive WoS and SCOPUS databases. Previous studies in various fields such as business (Qiu & Freel, 2019), finance (Spasenic, Milosavljevic, & Milanovic 2022; Goyal& Kumar, 2020), and share economy (Cheng, 2016; Hossain, 2020) confirmed the reliability of WoS and SCOPUS for various types of academic reviews.

The publication search employed a word string with 15 keywords linked by the Boolean OR operator, covering various facets of online work platforms with the main goal of comprehensively capturing the expanding nature of this research field. The rationale behind selecting the combination of keywords is in detail explained in Vukmirovic et al. (2023). Further, the research string is extended by an additional two words, “Tax” and “Taxation”, to narrow our search exclusively to taxation aspects of OLPs. The search resulted in 11 papers. Keywords are presented in Table 1.

Table 1. Boolean taxonomy for the search (Source: Authors’ work)

Group	Keywords
Group 1	“Platform work” OR “Online labor platform” OR “Digital labor platform” OR “Employment platform” OR “Job platform” OR “Job marketplace” OR “Job posting site” OR “Labor market-place” OR “Gig platform” OR “Freelance platform” OR “Freelancer platform” OR “Task platform” OR “Gig economy platform” OR “Talent marketplace” OR “Remote work platform.”
AND	
Group 2	“Tax” OR “Taxation”

The subsequent phase involved a content analysis of the obtained publications, aiming to refine the research sample to publications specifically centered on taxation aspects of online work platforms. Each author independently reviewed the full text of all 11 publications, selecting titles relevant to the research questions. Following predefined criteria, articles were included if they strictly pertained to the taxation of OLPs and had a full English text available. Conversely, articles were excluded if only marginally related to the taxation of OLPs, unrelated to the study's focus, or article is non-research publication. The final sample included 10 research papers. We conducted a scoping review by examining the full text of selected papers to (i) clarify key concepts of OLPs taxation, (ii) examine how research is conducted on a specific topic and (ii) identify research gaps.

3 Results

In total, 11 publications were derived from the Boolean search from two representative databases. As seen through the lens of the main stakeholders, we categorized all the papers into three broader streams: [1] Internationalization and supra-governmental factors of taxation, [2] Government-to-platform relations, and [3] Platform-to-employee relations.

As for the first stream of research – internationalization and supra-governmental factors of taxation – papers usually deal with ratifications of international conventions, cross-border platform work, or global displacement of labor. Tkachenko (2019) assesses the challenges faced by the ILO, focusing on the organization's struggle to increase global ratifications of conventions and the persistent low levels of ratifications crucial for social and labor development. The author explores issues arising from the fragmentation of international law, particularly contradictory interpretations, and examines the challenges associated with the latest ILO recommendation on transitioning from informal to formal economies, attributing difficulties to tax burdens on entrepreneurs in numerous countries. Vukorepa (2020) investigates the challenges posed by cross-border platform work, focusing on issues related to the free movement of workers and social security coordination. The main findings underscore the need for improved mechanisms and policies to address the legal and regulatory gaps, ensuring effective coordination of social security provisions and safeguarding the rights of workers engaged in cross-border platform work. Lynn et al. (2021) address the challenges encountered by the global displaced population, emphasizing the discrimination and hurdles associated with refugee status while debunking misconceptions about refugees as financial burdens. The authors propose Nanojobs, a tailored crowd-working platform for refugees, aiming to overcome identity authentication, task matching, training, device heterogeneity, internet connectivity, payment, and tax issues to facilitate their access to work opportunities and benefits.

The second stream of research deals with a government-to-platform relationship taking into consideration specific responses of governments to the taxation conundrum. Bernhardt et al.'s (2023) study utilizes tax data to examine the prevalence and characteristics of independent contracting and self-employment in California. By analyzing tax-related measures, the study sheds light on the growth and distribution of such work, emphasizing the role of tax administration in enforcing accurate reporting. The research underscores the importance of understanding tax implications for independent contractors, particularly in the context of evolving work structures and the need for nuanced policy responses, especially in light of the COVID-19 pandemic's impact on gig work and economic stability. To compare the legal status of the EU and Canadian platform workers, the study by Gebert (2023) critically evaluates the European Commission-introduced directive proposing five criteria to classify platform economy workers as salaried employees, and Canadian experience, where labor law recognizes "dependent contractors" with autonomy, particularly for tax purposes. Despite apparent similarities, challenges arise in implementing uniform protections due to the federal structure of labor law in Canada and the social dimension of the single market. Ogembo and Lehdonvirta (2020) delve into the taxation challenges posed by earnings from the platform economy, proposing the concept of an EU digital single window for income data as a potential solution. The study explores the complexities of taxing income generated through digital platforms and suggests the creation of a centralized system to streamline and share relevant income data across the EU member states, emphasizing its potential benefits in enhancing tax compliance and administration. Chesalina (2020) examines the social and labor rights of "new" self-employed individuals, with a specific focus on self-employed platform workers in Russia. The study delves into the legal framework governing the rights of these workers, exploring issues such as social security, employment protection, taxation, and access to benefits. The main findings highlight the need for policy adjustments to better safeguard the rights and well-being of this emerging category of workers in the Russian context. Inversi (2021) reveals exploitation and illegal intermediation in platform work hiring, known as *caporalato*. The paper highlights findings from the Procura of Milan's investigations and the Tribunal of Milan's decision in the Uber Italy Srl case, exposing the intricate subcontracting system used by platforms that leads to work exploitation and *caporalato*, particularly emphasizing the exploitation of migrant workers within the Uber system through fear tactics, pay deductions, and illegal tax arrangements.

The third stream of research delineates a platform-to-employee relationship. Brown (2019) examines the employment classification of ride-hailing drivers, arguing for their recognition as autonomous independent contractors and advocating for their right to collective bargaining. The main findings highlight the potential positive outcomes of collective negotiation for labor rights and overall working conditions. Finally, Brawley (2017) delves into the pivotal role of industrial and organizational psychology in the gig economy, emphasizing the transformative influence of technology-driven platforms like Uber and MTurk. Challenging conventional views, it emphasizes the integral connection between technology and work in the gig economy, illuminating the precarious nature of such employment. Supported by taxation estimates, the paper highlights a significant and growing portion of the US workforce participating in this evolving work structure.

4 Discussion and conclusions

This paper aims to provide a scoping review of the taxation of online labor platform work. We found that 11 papers from relevant scholarly databases deal directly with the taxation of OLPs. When observed through the stakeholder point of view, we see that cross- and transnational, government-to-platform, and platform-to-employee relationships are the only ones examined so far.

Our paper contributes to the concurrent body of knowledge by providing the first literature review on the taxation of OLPs. Hitherto, only self-employment in a broad sense has attracted scholarly attention (i.e., Boeri et al., 2020; Krajewska & Krajewski, 2021). The stakeholder principle of systematization has been used only for practical purposes (EY, 2020). This study shows that the field of OLP taxation is still underexploited with many opportunities for further investigation, including policy-making for effective taxation (OECD, 2019; Milosavljevic, Radovanovic & Delibasic, 2023), best international practices in taxation and many other.

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Sharing Economy Index: How Can it Be Altered?

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Abstract. *Sharing economy is defined as a business model in which individuals (providers) share an unused resource with others (consumers) for a predefined period and price via online platform. Since the model first emerged in the 2000s, it quickly spread in industries such as transport, tourism, apparel, working space, and others. With it, the need of decision-makers and practitioners for a metric and ranking system, emerged. To this day, several metrics have been devised. The composite index which is the focus of this study is the Sharing Economy Index (SEI) 2023, published by Consumer Choice Center. The interest of the paper is to observe and scrutinise the current weighting scheme of the index by applying the statistical multivariate analysis Ivanovic distance (I-distance) and Composite I-distance Indicator (CIDI) methodology. The results show that the SEI structure should be in four pillars, with the most importance awarded to E-Scooters indicator. This paper attempts to draw attention to the field of composite indicators in the field of sharing economy and their methodological aspects.*

Keywords. *Sharing economy Index, Ivanovic distance, composite indicator, weighting scheme, CIDI*

1 Introduction

Intense digitalisation, the Internet, and the development of ICT lead to the development of new business models such as e-commerce (e.g. Amazon), Subscription-based models (e.g. Netflix), Digital content creation and monetisation (e.g. Youtube), Blockchain and cryptocurrency-based models (e.g. NFTs), and sharing economy (e.g. Airbnb, Uber). The business model which attracts a lot of attention among various stakeholders is the sharing economy. According to Puschmann and Alt (2016) “*contrary to the traditional market model, which is based on ownership, the “Sharing Economy” is built on using and sharing of products and services among others*”. As the sharing economy is on the rise (Zervas et al., 2017), there is a need to provide a metric which will allow ranking of different entities (cities, regions, countries) based on the level of its adoption. Useful metrics of such a complex, multidimensional, and interdisciplinary phenomenon are composite indicators. OECD (2004) defines composite indicators as quantitative measures that combine multiple individual indicators or dimensions into a single, aggregated index.

Although composite indicators are very useful metrics, one should consider some of their methodological issues. Namely, the methodological steps of indicator selection process, weighting scheme determination, and aggregation method of composite indices have faced widespread criticism for their subjectivity (Greco et al., 2018). The step that attracts scholars' and practitioners' attention is individual indicator weighting. The allocation of weights to indicators is a crucial aspect of composite index development, giving rise to uncertainty and debate throughout the process (Becker et al., 2017). Therefore, particular attention should be paid to this phase when constructing a composite index. The assignment of weights may rely on statistical methods, expert methods, or their combination (Maricic et al., 2019; OECD, 2004). However, data-driven weighting schemes are seen as objective and more reliable than expert-driven ones (Banerjee, 2018).

Among several composite indicators in the field of sharing economy, the index which attracted our attention was the Sharing Economy Index (SEI) published by the Consumer Choice Center (Consumer

Choice Center, 2024). Although the SEI is comprehensive in sense it covers as many as nine aspects of sharing economy market, its methodology could be more comprehensive in the statistical aspect. The issue of the SEI we aim to tackle is the weighting scheme. In the current form, the weighting scheme is equal and the aggregation method is the simple sum. We are interested in exploring whether the equal weighting scheme is appropriate and, if not, how it should be changed. To scrutinise the SEI, we will apply the Ivanovic distance (I-distance) method (Ivanovic, 1963).

The paper is structured as follows. In the second section, we provide an overview of the currently devised composite indicators in the sharing economy. The third chapter presents the methodological aspects of the Sharing Economy Index and the applied I-distance method. In the chapter that follows, we present the results. The final section comprises the discussion and concluding remarks.

2 Composite indicators on the topic of sharing economy

Composite indicators on the topic of sharing the economy can be divided into two groups: those proposed by organisations and those proposed by scholars. MSCI ACWI IMI Sharing Economy Index is developed by MSCI corporation to show the performance of businesses involved in the creation of new goods and services encompassing sharing economy. Due to the ambiguous transparency of the methodology used, no further information is available. Another noteworthy example was Timbro Sharing Economy Index developed by the Swedish think tank Timbro in 2018. The goal of the index is to measure the amount of global activity in the sharing economy. Their research methodology consisted of a three-phased data acquisition process, which combined both an Internet traffic indicator and scraped data about the number of active suppliers on a service. Giovanini (2021) underscored the utilisation of regression analysis for the development of a sharing economy index that ranked 175 countries based on a vast amount of available internet traffic data. As presented, different approaches to creating composite indices in the sharing economy have been suggested in the literature so far.

3 Sharing Economy Index (SEI)– Methodology and scrutinisation

The Consumer Choice Center, as a global consumer advocacy group, is devoted to providing reports for consumers of different services (nightlife, air travel, betting), as well as indices on lifestyle choices, smart policies, science, healthcare. The Sharing Economy Index (SEI) is just one of the many indices this center publishes. Some of them include European railway station index, Nightlife index, Pandemic resilience index, and Fan friendly stadium index (Consumer Choice Center, 2024).

The Sharing Economy Index (SEI) was first published in 2020 when it ranked 52 cities using seven indicators. Each year, the index methodology is improved, and the list of cities covered is increased. In the year 2023, for which the data is available, the SEI ranked 60 cities worldwide using nine indicators: Ride-hailing (availability and accessibility) (40 points), Carpooling (10 points), Professional car sharing (30 points), Ultra-fast delivery apps (10 points), Peer-to-peer lending (availability and accessibility) (20 points), Gym sharing (10 points), Library sharing (10 points), Flat sharing (availability and accessibility) (20 points), and E-scooters (10 points). The points are awarded based on whether or not a particular sharing service is available and based on which conditions. The weighting scheme is equal weighting while the aggregation method is simple sum. The SEI is calculated as the sum of the nine variables. Therefore, the maximum number of points a city can accumulate is 160. According to the 2023 ranking, Vilnius (Lithuania) tops the list with 155 points, followed by Buenos Aires (Argentina) with 145 points and Madrid (Spain) and Belgrade (Serbia) who share the third place with 140 points.

3.1 Ivanovic distance (I-distance) method

To assess the equal weighting scheme suggested by the index creators, we will employ the Ivanovic distance (Ivanovic, 1963). The Ivanovic distance is a statistical multivariate method which calculates the mutual distances between the entities being processed, whereupon they are compared to one another to create a rank (Jeremic et al., 2011). The distances in the I-distance represent the distance of an observed entity from the fixed, referent entity (Maricic et al., 2019). Most commonly, the fixed entity is a fictive entity which has the minimal measured values of each indicator. Therefore, the higher the value

of the calculated I-distance, the better the entity performs. The formula by which the I-distance is computed is (Jeremic et al., 2011)

$$D^2(r, s) = \sum_{i=1}^k \frac{d_i^2(r, s)}{\sigma_i^2} \prod_{j=1}^{i-1} (1 - r_{ji,12\dots j-1}^2) \quad (1)$$

Where $d_i(r, s)$ is the distance between the values of the indicator X_i for entities e_r and e_s , σ_i^2 is the variance of the indicator X_i , while $r_{ji,12\dots j-1}^2$ is the coefficient of partial determination between indicators i and j .

What additionally makes the I-distance method stand out is the fact that besides just providing ranks, it can be used to propose data-driven weights. The process of assigning I-distance derived weights is referred to as the Composite I-distance Indicator (CIDI) methodology (Dobrota et al., 2016). To obtain objectively assigned weights, the initial step involves calculating the correlation coefficients between each indicator and the I-distance value. Subsequently, the next phase involves computing new weights for each indicator by dividing the correlation coefficient with the I-distance value by the sum of all correlations. The resultant sum of weights equals 1, establishing a new and appropriate weighting system.

4 Results

Before the application of I-distance and CIDI on SEI 2023, we present the descriptive statistics of the nine SEI indicators (Table 1). As can be seen, indicators are not measured on the same scales; some are on the scale from 0 to 40, while some are from 0 to 10. The indicator with the largest standard deviation is *Ride-hailing*, 10.481. This result indicates that the cities differ in performance. Although the median is quite high, 30, there are cities which visibly underperform. Interestingly, for the indicator *Professional car-sharing*, the minimal measured value is 20, which might signal that all observed cities have embraced a form of car sharing services. Looking at the four indicators measured on a scale from 0 to 10, the indicator with the smallest mean is *Ultra-fast delivery* (7.670), while the indicator with the highest mean is *E-scooters* (9.330). This could indicate that cities have widely adopted e-scooters.

Table 1. Descriptive statistics of the nine SEI indicators (Source: Authors' work)

	Ride-hailing	Carpooling	Prof. car sharing	Ultra-fast delivery	P2P lending	Gym sharing	Library sharing	Flat sharing	E-scooters
Mean	26.250	8.830	28.170	7.670	12.670	8.50	8.17	10.120	9.330
Std	10.481	3.237	3.902	4.265	5.856	3.601	3.902	4.434	2.515
Me	30.000	10.000	30.000	10.000	15.000	10.000	10.000	10.000	10.00
Min	0	0	20	0	0	0	0	5	0
Max	40	10	30	10	20	10	10	20	10

In the next step, we applied the I-distance method. We used the quadratic I-distance and the minimal entity as the referent. The initial application of the I-distance indicated negative correlation coefficients of indicators with the I-distance value. Such a result is a signal that the underlying structure of the SEI should be altered as well. Principal component analysis (PCA) with Varimax rotation was employed to propose a novel structure. The pretests showed that the data is suitable for the analysis (KMO=0.554, Bartlett's test=133.416, $p < 0.001$). PCA suggested a four-component structure which explains 73.046% of variability. The new suggested structure is the following: Micromobility (E-scooters), Lifestyle (Gym sharing, Prof. car sharing, Ultra-fast delivery, Library sharing), Long-term sharing activities (Carpooling, P2P lending) and Short-term sharing activities (Flat sharing, Ride-hailing). To obtain the I-distance weights, the CIDI methodology was applied in two folds: first to obtain weights within the pillar, and second to determine the weights among pillars. The obtained weights are presented in Table 2. Looking at the weights within pillars, in pillars with two indicators, the weights are almost equal. However, in the

pillar Lifestyle, there are some differences. The most important indicator within the pillar is Gym sharing (0.316), while the least important is Library sharing (0.188). Analysing the pillar weight, again slight difference in the importance can be noted. What is also useful to observe are the total indicator weights. The individually most important indicator for the ranking process is E-scooters, followed by P2P lending and Carpooling.

Table 2. I-distance derived weights of the nine SEI indicators (Source: Authors' work)

Pillar	Micromobility	Lifestyle				Long-term sharing activities		Short-term sharing activities	
Indicator	E-scooters	Gym sharing	Prof. car sharing	Ultra-fast delivery	Library sharing	Carpooling	P2P lending	Flat sharing	Ride-hailing
Indicator weight	1	0.316	0.285	0.211	0.188	0.464	0.536	0.521	0.479
Pillar weight	0.226	0.247				0.293		0.234	
Total weight	0.226	0.078	0.070	0.052	0.046	0.136	0.157	0.122	0.112

Due to limited space, we will not present the full I-distance rankings herein. However, the results are available on request from the corresponding author. The top and bottom ten ranked cities based on the I-distance rank compared to the official SEI rank are presented in Table 3. Vilnius and Buenos Aires top the list in both rankings, Belgrade and Madrid stayed on close 3rd and 4th ranks. According to the I-distance, the Hague and Mexico City found their place in top 10, moving from 14th and 18th place respectively. Looking at the bottom of the list, no drastic changes occurred, except for Shanghai who dropped from 50th to 55th place.

Table 3. Top and bottom ten ranked cities based on the I-distance rank compared to the official SEI rank (Source: Authors' work)

SEI	SEI rank	I-dist SEI	I-dist rank	City	SEI	SEI rank	I-dist SEI	I-dist rank	City
155	1	16.951	1	Vilnius	100	49	11.701	51	San Jose
145	2	16.311	2	Buenos Aires	95	52	10.203	52	Nicosia
140	4	15.701	3	Belgrade	87	55	9.933	53	Valletta
140	3	15.220	4	Madrid	84	56	9.725	54	Tokyo
136	5	14.732	5	London	100	50	9.298	55	Shanghai
135	6	14.660	6	Barcelona	91	53	9.014	56	Copenhagen
135	10	14.660	7	Helsinki	90	54	8.717	57	Istanbul
135	14	14.611	8	Hague	80	57	8.372	58	Luxembourg
130	18	14.580	9	Mexico City	73	59	7.956	59	Ljubljana
135	9	14.435	10	Stockholm	71	60	7.712	60	Athens

5 Discussion and conclusion

This study aimed to assess the methodological choices of the SEI related to the index structure and weighting scheme. The application of I-distance and CIDI showed that the SEI should be restructured and that equal weighting is not an adequate weighting approach. The directions of future research could encompass the application of other statistical methods to assess the SEI, such as the Benefit of the Doubt (Rogge, 2018), a combination of BoD and I-distance (Maricic & Jeremic, 2023), or even ultrametric composite indicator (Cavicchia et al., 2024).

We hope our study will serve as validation for the methodology and results of the SEI and as a source of guidance for potential methodological improvements to this metric. Additionally, this research could have the potential to initiate innovative approaches in evaluating sharing economy acceptance, with potential implications for decision-makers on the city level in the future.

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Segmentation of Ride-Sharing Consumers: The case of BlaBlaCar Users From the Republic of Serbia

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Abstract. Shared mobility can be defined as transportation services and systems that allow individuals to access and use vehicles or means of transportation on a shared basis rather than owning them. Forms of shared mobility encompass ride-sharing, carpooling, bike-sharing, car-sharing, and others. The question that tackles practitioners in the field is how users of these services can be segmented. Therefore, this study aims to segment Serbian users of a ride-sharing platform, BlaBlaCar. The data utilised in the paper was collected through an empirical study conducted from May to December 2023. Employing the k-means clustering algorithm, the resulting segments provide insights into the differences in behaviour, experience, and satisfaction with the BlaBlaCar platform and service among users. This research serves as a potential catalyst for further exploration of segmentation analysis in the fields of sharing economy and shared mobility.

Keywords. Shared mobility, ride-sharing, BlaBlaCar, segmentation analysis, quantitative research

1 Introduction

In the past decades, the world market and the global economy have experienced significant transformations, which resulted in the formation of new and flexible forms of economic activity, instead of classic business models (Muñoz & Cohen, 2017). One of the key trends that has emerged is the sharing economy, which uses digital technologies to enable individuals and groups to share goods, services and experiences. This evolution has not only changed the way people live and work, but has also fuelled the emergence of innovative business models (Richter et al., 2017). The sharing economy takes many forms, such as accommodation sharing (like Airbnb), mobility sharing (like BlaBlaCar and Uber), workspace sharing (like WeWork), clothes sharing (like PopSwap), and many others (Bojković et al., 2022). In this model, the value is the ability to access and use a resource that is needed and not owned for a predetermined period of time at a defined price (Belk, 2014).

A particularly interesting and rapidly growing segment of the sharing economy is shared transportation (Cohen & Kietzmann, 2014), and this research will focus on the experiences of users of shared rides in Serbia. The concept of shared transport enables the multiple use of transport resources by different individuals, organisations or clients. This approach aims to achieve economic efficiency, reduce costs and improve the overall sustainability of the transport system. In addition, traffic congestion and greenhouse gas emissions are reduced, positively impacting the environment. So far, different forms of shared transport have been devised: Carpooling, Ride-sharing, Bike/Scooter/Car-sharing Services, Peer-to-Peer Car Rental, and more. The particular sharing mobility practice that caught our attention is ride-sharing and the platform BlaBlaCar. Ride-sharing platforms connect drivers with passengers heading in the same direction, thus contributing to cost-sharing and reducing the number of single-occupancy vehicles on the road. BlaBlaCar has operated in the Republic of Serbia since 2015. Based on the report after the first operating year, the users shared as much as 3 million km (Živojinović et al., 2022), which was a good signal that the users in the Republic of Serbia accepted this platform. This study aims to segment the users of the BlaBlaCar platform in Serbia, explore their socio-demographic background and their level of satisfaction with the platform.

The data was collected using a survey, while as a segmentation algorithm, k-means clustering was applied.

The paper is organised in the following way. The second section provides an overview of the segmentation studies done in the field of sharing economy, particularly in shared mobility. In the subsequent section, we present our research methodology, the overview of the data collection process and the segmentation algorithm applied. The results of the segmentation analysis are outlined in section four. The paper concludes with a synthesis of our key findings, encapsulating our contributions to the broader academic discourse.

2 Literature review

This literature review reviews several relatively recent papers regarding the segmentation of users of shared mobility services. The study by Wang et al. (2022) explores latent shared mobility preferences in low-income communities, particularly regarding the adoption of Mobility-on-Demand (MOD) transit services. Conducted in Detroit and Ypsilanti, Michigan, the research utilises latent class cluster analysis (LCCA) to examine the attitudes of 825 survey respondents towards various transit options, including ride-hailing services, fixed-route transit, and MOD transit. It identifies three latent segments among respondents: *shared-mode enthusiasts*, *shared-mode opponents*, and *fixed-route transit loyalists*. The study suggests that shared-mode enthusiasts, primarily prevalent in areas with limited transit access, may serve as early adopters of MOD transit services. In contrast, shared-mode opponents predominantly comprise vehicle owners with minimal interest in shared mobility. Moreover, it highlights demographic trends associated with preferences for MOD transit services, emphasising the importance of user perspectives in developing tailored policy interventions to enhance accessibility and equity in urban mobility solutions.

The study of Mohiuddin et al. (2024) explores bike-share dynamics and equity in Sacramento through user surveys, revealing insights into perceptions, socio-economic factors, and usage patterns. By categorising users into "*disgruntled*," "*satisfied*," and "*transit*" segments, the research unveils the complex interplay between these variables. Despite less favourable views, the "disgruntled" segment comprises frequent bike-share users facing vehicle access constraints and lower incomes. In contrast, despite positive perceptions, the "satisfied" group, with higher incomes and car ownership, engages more moderately with bike-share. Similarly, the "transit" segment, akin demographically to the "disgruntled" group, exhibits lower bike-share usage, indicating a reliance on transit. These findings underscore the importance of considering socio-economic factors alongside user attitudes, presenting opportunities to enhance bike-share accessibility and usage, particularly among transit-dependent populations. The study contributes to fostering sustainable urban transportation solutions.

Authored by Soto et al. (2021), this study emphasises the need to tailor sustainable transport policies to diverse population preferences. Through a survey of 1,041 car owners across Colombian cities like Bogotá and Medellín, the research employs a Multiple Indicators Multiple Causes (MIMIC) model to assess attitudes towards environmental issues, green transport policies, car usage, and technology. Cluster analysis identified three groups - *Traditionalists*, *Green Conscious*, and *All Matters* - revealing the interplay between car attachment and environmental concern. The study suggests customised strategies for each segment, advocating for personalised actions and marketing approaches to promote sustainable transport policies effectively. By examining the Colombian context, the research sheds light on modal shift preferences among car owners, highlighting the importance of understanding individual behaviours in shaping inclusive and impactful sustainable mobility policies.

These studies indicate interest in segmentation analysis in shared mobility, that different algorithms are applied, and that the analysis is done in multiple spheres of shared mobility.

3 Case study setting

To address the research question and gain insight into how users of ride-sharing in Serbia can be clustered, an empirical survey was conducted using the Google Forms platform from May 2nd to December 2nd, 2023. The structured questionnaire encompassed a wide range of factors related to

different aspects of shared mobility usage. The survey was targeted exclusively at individuals who had previously utilised shared mobility services, specifically the BlaBlaCar company's services. The devised survey comprised of 25 questions covering demographic information such as year of birth, gender, education level, place of residence, monthly income, and number of cars in the household, providing insight into the socio-demographic profile of service users. The subsequent segment of the survey focused on investigating respondents' personal experiences and attitudes towards the BlaBlaCar service. Participants were asked to express their views on statements using a Likert scale ranging from 1 (Strongly disagree) to 5 (Strongly agree), including satisfaction with the service price, perception of the price-quality ratio, ease of app use, ease of communication with drivers, usefulness of the review system, competency and adherence of drivers to agreements, safety concerns, and potential data misuse. Additionally, respondents were given the opportunity to express their views on future service usage, including the possibility of reusing the BlaBlaCar application and their preference for this service over other transportation methods in the future.

To segment the respondents, we used the k-means algorithm (Hartigan & Wong, 1979). This algorithm has been widely acknowledged in the literature for its effectiveness in producing high-quality clustering results across different domains (Maričić et al., 2019). While k-means clustering offers several advantages, including its simplicity and computational efficiency, it is important to acknowledge its limitations. One significant downside is its sensitivity to initial cluster centroids, which can lead to varying results with different starting points. Additionally, k-means clustering assumes spherical clusters of similar sizes, which may not always align with the underlying data distribution.

4 Results

4.1 Sample description

In the conducted research, we had 116 participants, comprising 78 female respondents (67.2%) and 38 male respondents (32.8%). This gender imbalance indicates a higher representation of female BlaBlaCar users among the surveyed participants. When analysing the distribution of participants by place of residence, the majority (78.4%) were from Belgrade, with others scattered across various cities in Serbia, including Novi Sad, Niš, and others. Concerning birth years, most respondents belong to younger generations, with the highest number born in the years 2000 and 2001. However, the sample was diverse, encompassing participants born between 1972 and 2010, thus representing older demographics, albeit to a lesser extent. Regarding education, the largest number of respondents indicated current enrolment in studies (51.7%), while a significant portion had completed vocational school or college (22.4%). Considering the economic characteristics of the participants, there was a diversity of monthly incomes, with a significant number of respondents choosing not to disclose their incomes (19.8%) and others having personal monthly earnings up to 40,000 RSD (32.8%). Looking at the respondents' employment status, 43.1% reported being students, while 27.6% were employed full-time, and 11.2% were employed temporarily. Regarding the number of cars in the household, most families owned two cars (41.4%), followed by those with one car (31%). A noticeable number of respondents indicated not owning a car in their household (17.2%). This sample encompassed various demographic groups and provides a diverse picture of BlaBlaCar users in Serbia. However, it is essential to mention a bias towards younger, more educated individuals, predominantly from urban areas, which may affect the generalisation of results to the overall population.

4.2 Segmentation analysis results

We performed cluster analysis in R using the "cluster" package. Before proceeding with the clustering analysis, it was essential to determine the optimal number of clusters that best represent the underlying structure of the data. This was achieved through the "Elbow Method" which identifies the point of maximum curvature in the plot of evaluation metrics versus the number of clusters (Maricic et al., 2022). We iterated the K-means algorithm for cluster numbers ranging from 2 to 8. A visual examination of the metrics plot confirmed this observation, with a clear "elbow" at 3 clusters. The resulting clusters were as follows.

Cluster 1 or *Trusting Enthusiasts* (6 respondents). All six respondents in this cluster provided a rating of 5 for the following statements: "I was not afraid for my safety when using the BlaBlaCar platform", "I am afraid that the driver will misuse my personal data", and "I will use the BlaBlaCar platform again." This indicates that respondents in Cluster 1 have a high level of trust in the BlaBlaCar platform regarding safety and are confident that they will use it again, despite significant concerns about the misuse of personal data by drivers. However, some of them reported receiving spam messages with an average rating of 3 and high dispersion, which likely impacted their overall sense of security. Furthermore, respondents in Cluster 1 expressed satisfaction with the price-quality ratio and demonstrated trust in the review system. They are notably inclined to prefer BlaBlaCar for future travel over other means of transportation, as evidenced by the high average rating of 4.83 (std = 0.41) for the statement "In the future, I will prefer travelling with BlaBlaCar over other means of transportation."

Cluster 2 or *Apprehensive Sceptics* (21 respondents). Individuals assigned to the second cluster demonstrate the lowest satisfaction levels regarding service pricing and the perceived relationship between service pricing and quality. Additionally, they expressed a pronounced fear during the application's usage, as evidenced by their average rating of 2.62 (standard deviation = 0.97) in response to the statement, "I was not afraid for my safety while using the BlaBlaCar platform." This indicates a notable level of apprehension and discomfort experienced by respondents within this cluster while utilising the BlaBlaCar service. Unlike respondents in the first cluster, individuals belonging to the second cluster exhibit a notable absence of concern regarding the misuse of their personal data. However, this lack of apprehension does not translate into a strong intention to reuse the BlaBlaCar platform, as evidenced by their average rating of 3.67 (std = 1.02). Additionally, they demonstrate the weakest inclination towards preferring BlaBlaCar services over alternative means of transportation, with an average rating of 2.71 (standard deviation = 1.06). From these observations, we can infer that the presence of apprehension regarding personal safety and dissatisfaction with service pricing exerts a stronger influence on the willingness to reuse the application than concerns about the misuse of personal data.

Cluster 3 or *Satisfied Advocates* (89 respondents). The largest cluster comprised highly satisfied users who found the application user-friendly and trusted the review system. They felt safe during rides, and their satisfaction with the pricing of the service appears to be the highest among all clusters (4.51, standard deviation = 0.61). Responses to specific questions provided further insights into their attitudes. For instance, when asked about their experience with the BlaBlaCar application not meeting their expectations, respondents in this cluster provided considerably lower average ratings compared to those in the first two clusters, with scores of 1.67 (standard deviation = 1.04). Similarly, their concerns about the misuse of personal data were expressed with notably lower average ratings. Interestingly, respondents in this cluster reported the lowest average rating for receiving spam messages after using the application, indicating a minimal presence of spam messages in their experience (average rating of 1.15 with a standard deviation of 0.51). This absence of spam messages could contribute to their overall satisfaction and trust in the platform. Furthermore, their strong intention to reuse the BlaBlaCar platform is evident from their responses to the statements: "I will use the BlaBlaCar platform again." and "In the future, I will prefer travelling with BlaBlaCar over other means of transportation.", where they provided high average ratings of 4.7 (standard deviation = 0.68) and 4.18 (standard deviation = 1.03), respectively. These ratings indicate a clear preference for using BlaBlaCar for future travel over other transportation means.

5 Discussion and conclusions

This study aimed to segment users of the BlaBlaCar platform in Serbia to understand their behaviour, experiences, and satisfaction levels. Three distinct user segments emerged: *Trusting Enthusiasts*, *Apprehensive Sceptics*, and *Satisfied Advocates*. The segmentation analysis revealed notable differences in user attitudes and preferences. *Trusting Enthusiasts* demonstrated high trust in the platform's safety features but expressed concerns about data misuse. *Apprehensive Sceptics* exhibited apprehension about safety and dissatisfaction with pricing but showed less concern about data misuse. *Satisfied Advocates* emerged as the largest segment, showcasing high satisfaction levels across various platform aspects, including safety, pricing, and user experience. These findings provide valuable insights for BlaBlaCar and similar platforms to tailor their services effectively and

address specific user concerns. For instance, efforts to enhance safety features and mitigate data misuse concerns could bolster user trust and satisfaction. Moreover, strategies to improve pricing transparency and address safety apprehensions may help attract and retain users, particularly those in the *Apprehensive Sceptics* segment. In conclusion, this research contributes to the understanding of user segmentation in the context of shared mobility platforms. By identifying distinct user segments and their preferences, stakeholders can develop targeted interventions to enhance user experience, foster trust, and promote sustainable shared mobility solutions. Also, identifying distinct segments within the market could allow BlaBlaCar to develop targeted marketing strategies addressing the specific needs and characteristics of different segments, leading to increased user acquisition and retention. Future research could explore additional factors influencing user segmentation and examine the long-term impact of tailored interventions on user satisfaction and platform usage.

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Preferences of Gen Z Towards Using Sharing Economy Platforms in the Fashion Industry: Evidence from Serbia

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Abstract. *The sharing economy presents a modern and more sustainable way of sharing resources, products and services between individuals, enabling the reduction of waste and sustainable consumption. To this day, sharing platforms in different industries, such as tourism, transport, finance and education, have been developed. This paper focuses on the sharing platforms in the fashion industry and the acceptance of their usage. To answer the raised question quantitative study was conducted among the young population (Gen Z) in the Republic of Serbia. The main objective of the paper is to show the level of awareness and willingness of Serbian Gen Z to use a platform for clothes, shoes and accessories sharing. To assess their acceptance of sharing platforms in the fashion industry we used the UTAUT model.*

Keywords. *Sharing economy, fashion industry, UTAUT model, Gen Z, clothes-swapping platforms*

1 Introduction

The digital economy is characterized by its reliance on digital technologies and the prevalent utilization of Information-Communication Technology (ICT), hardware and software, telecommunications and applications across all sectors (Đorić, 2020). Digital transformation in online sales uses a variety of tools to respond to customer needs and preferences more effectively (Rađenović et al., 2023). Đorić (2020) states that the digital economy encompasses the internal and external activities between organizations, organizations and individuals, and among individuals, presenting a suitable basis for the Sharing Economy (SE). SE presents a new, redesigned business model of the digital economy, that uses the Internet and ICT. It is a modern concept of sharing resources, integration of the community, preservation of resources and sustainable development (Bojković et al., 2022). In the last few years, the concept of SE has drawn a lot of public attention with a wide field of applications. It has been widely popularized worldwide as a concept of mutual share or exchange of products and/or services between individuals or a group of people, increasing the level of reuse of existing resources and decreasing the need for shopping, as well as the ecological footprint and waste. SE also presents a social movement and lifestyle (Cheng, 2016), guided by the idea of moving from “owning” to “sharing” and from temporary ownership to short-term ownership.

In the Republic of Serbia, low levels of municipal waste reuse, recovery and recycling, a scarcity of advanced technology, substantial volumes of waste disposal and insufficient economic incentives are the main bottlenecks of its sustainable development (Ilić & Nikolić, 2016), implying that the awareness of the environmental status and practices for reduction of the environmental impact (such as SE practices) in the Republic of Serbia is at a low level. There are many national and international SE platforms operating in the Republic of Serbia that are insufficiently used and mainly related to transportation, accommodation and selling of food, clothes and footwear (Bojković et al., 2022). However, statistical data indicates that the population in the Republic of Serbia is suitable for the adoption of SE platforms. Based on the statistics on the usage of ICT in the Republic of Serbia, for the year 2023 (Statistical Office of the Republic of Serbia, 2024), 85.6% of respondents have an Internet

connection at home, while 75% of respondents have used a computer in the last three months. As for online shopping, 51% of respondents bought/ordered goods or services online and the largest percentage of respondents (69.7%) ordered clothes (including sportswear), shoes or accessories (bags, jewellery). Encouragingly, there is also gradual progress in areas such as Internet usage and digital public services (Đorić, 2020). In the Republic of Serbia, classified by area and key characteristics, there are five types of national and international platforms and providers of SE (Živojinović et al., 2022): accommodation (living and (co)working), transportation (car sharing and driving share), finances (group and shared investment), human resources – on-demand services (cleaning, cooking, professional services, pet service and others) and consumer durables. Looking at the experience of those who already participated in the SE, the findings outlined in (Krstić, Veljković & Kuc, 2023) indicate that participants (users and providers) within the Republic of Serbia are satisfied with experiencing SE and have positive assessments of platform functionality, the precision and promptness of service delivery, reasonable pricing and the amiable nature of service providers, prioritizing financial gains and cost-effectiveness. Research results of Maričić and associates (2023) show that age, level of financial income and size of the city where respondents grew up, significantly impact the decision to participate in SE.

Having in mind that the Republic of Serbia is slowly but surely adopting SE practices, the aim of this paper is to observe the awareness of the younger population (Gen Z) of SE platforms for clothes, shoes and accessories, as well as their readiness to use such platforms. To do so, a survey was conducted among the Gen Z population in Belgrade, Republic of Serbia. To measure their acceptance of the SE platforms in the fashion industry, the Simplified Integration Theory of User Acceptance and Utilization (UTAUT) model was employed. The paper is structured as follows. After the introductory part, a literature review on the current operation platforms of SE in general and in the fashion industry is presented in the second chapter. The third chapter presents the case study settings and research methodology. The results are presented in the fourth chapter. The fifth chapter presents the discussion and concluding remarks.

2 Sharing economy platforms in the fashion industry

Regarding the fashion industry, there are several SE platforms, as well as mobile applications available worldwide. Some of them are presented in the following. Popswap, Sellpy, Plick and Refine group are Swedish online platforms that enable renting, selling, buying or exchanging clothes and accessories across nearly all European markets. The *Popswap* mobile application matches and connects users (called Style Twins) with similar fashion styles and preferences. This application enables users to create virtual wardrobes, explore the styles of other users, and borrow clothes, bags and shoes (by swapping in the application), fostering a community of fashion enthusiasts committed to sustainability. The objective of this application is to enable sustainable fashion and wardrobe and to enjoy the process by all users (Popswap, 2024). *Sellpy* presents an online platform and mobile application for selling and buying second-hand items, enabling more sustainable online consumption of things and clothes. This platform shows the emissions savings for each item purchased through the platform instead of purchasing the same new product. They additionally show the reduction of water and CO₂, representing the main idea: longer life for items, reduction of emissions and water saving. Also, they enable 10 weeks as a selling period and after that, if the item is not sold, they donate it to a charity (SOS Children's Villages, Stockholm City Mission, Save the Children, UNHCR and Djurens Rätt) or recycle it (Sellpy, 2024). *Plick* is a platform and mobile application for online selling and buying second-hand clothes, shoes and accessories (Plick Rethink fashion, 2024). The *Refine Group*, previously called Spherio Group, is a company that manages resale marketplaces and provides a Software as a Service (SaaS) platform for brands and companies, allowing efficient management of the resale of excess samples, inventory and second-hand items (Refine Group, 2024). *Rent the Runway* is a US and UK platform and mobile application that enables users to rent or buy designer clothes and accessories, for special occasions and every day (Rent the runway, 2024). *By Rotation* is an online US and UK platform and mobile application where users can lend and rent clothes and items, connecting like-minded users to monetize, share and consume fashion (By rotation, 2024). The *My Wardrobe HQ* is a UK rental online platform, where users can rent or buy luxury-designed clothes and accessories, for everyday, special occasions or even sports (My wardrobe HQ, 2024).

In the Republic of Serbia, it is common to rent dresses, clothes and shoes for special occasions, wedding dresses, accessories, men's suits, working clothes, and others. Customers can see only part of the offer on the store's website, but the renting must be done in person in-store. In this industry, the Republic of Serbia does not have many developed SE platforms. To our knowledge, there is only one platform that functions in this way, called *Moje krpice* (*Moje krpice*, 2024). It presents an online community where people can buy, sell or exchange clothes and accessories that are in good condition. Every item requires a photo, name, price, size, city (of the seller), description of the item and colour. Every seller and buyer needs to have a profile, with reviews from other users with whom they had cooperation (sold or bought).

3 Case study settings

Young people in the Republic of Serbia try to follow worldwide trends and keep up-to-date with world events. It is often mentioned today that the SE paradigm relies on the Millennial generation, who are between 18 and 38 years old (Brkljač & Sudarević, 2018). For this reason, young people (students) were the target group for conducting this research. To examine the potential for the development of SE platforms in the fashion industry in the Republic of Serbia, a survey was conducted in February 2024 in Belgrade, Republic of Serbia. The online survey was anonymous, conducted using Google Forms. The link to the survey was distributed on the personal profiles of authors and their acquaintances. A convenience sampling approach was used. The survey consisted of five segments: socio-demographic questions, questions related to previous experience in using SE platforms, perceived benefits and drawbacks of the SE concept (Maričić, Drinjak & Popović, 2023), SE platforms in the fashion industry and the questions of the UTAUT model. UTAUT model, proposed by Venkatesh et al. (2003), uses four independent variables: Performance Expectancy (PE), Effort Expectancy (EE), Social Effect (SI) and Facility Condition (FC), and Behavioural Intention (BI) as a dependent. To analyse the data, SPSS 28 and SmartPls 4 were used.

4 Results

In total, 108 individuals participated in the survey, out of which 78.7% were female and 21.3% were male. A gender disproportion is visible, but it could have been expected having in mind the topic of the survey (fashion, clothes, accessories) and that females are more prone to participating in surveys. The average age of the respondent was 24.685 with a standard deviation of 3.952. The age of the respondents varied from 17 to 36. As much as 66.7% of respondents heard of the SE concept, while 81.5% stated they used one or more SE platforms. The observed difference in percentages indicates that individuals participate in the SE, without being aware of the concept itself. Among the five observed benefits of SE, most respondents agree that SE allows the efficient use of resources (mean=4.440, std=0.846) and the possibility to save/earn money (mean=4.390, std=0.830). Respondents most commonly used the platform in the Republic of Serbia and abroad (47.2%), while 25.9% used it only in the Republic of Serbia, and 8.3% just abroad. This indicates that the respondents are open to using sharing platforms in both the Republic of Serbia and abroad. Looking at the drawback of the concept, the respondents find the fear of fraud (mean=4.414, std=0.932) as the most problematic one.

As the main interest of the research is to observe the respondents' propensity to use sharing platforms in the fashion industry, we introduced several questions related to the respondents' habits in shopping of clothes and accessories. The average monthly spending on clothes and accessories is 7876.47 RSD (65 Euros) with a standard deviation of 6861.071. The spending range is from 1000 RSD to 50,000 RSD. The clothes and accessories are usually bought in stores, from time to time online and via social networks, and rarely or never in second-hand shops. Almost 60% of respondents (58.3%) knew that platforms for sharing clothes exist. However, just 21.3% were confident they would use such a platform, while 54.6% were still not sure. Interestingly, looking at their role on the platform, 48.1% would be a customer and provider, showing that respondents are open to sharing/selling/renting their clothes and accessories. Also, a result worth mentioning is that more respondents would be just providers (13.0%) than just customers (10.2%). As much as 8.3% saw themselves as "observers", those who are not actively participating in the sharing, but are swiping and looking at the offers. When asked what they would share on such a platform, as a multiple-choice question, in the same percentage of all answers,

the respondents would share clothes and accessories (36.41%). The answers also point out that the respondents are not that open to sharing shoes.

To test the shortened UTAUT model, we employed the partial least squares structural equation modelling (PLS-SEM) algorithm. Before conducting the model verification, we assessed the scale consistency, validity and mean values. Scale consistency was measured using Cronbach's alpha, while the construct validity. All scales have Cronbach's alpha above the threshold of 0.7 and the AVE above 0.5 (Table 1). These results indicate that the scales are reliable and that their structure should not be altered. Looking at the means, the scale with the highest mean is *Facilitating Condition (FC)*, while the *Behavioural Intention (BI)* is the lowest, just 2.567.

Table 1. Scale consistency, validity and mean values (Source: Authors' work)

	PE	EE	SI	FC	BI
No. of items	3	3	3	2	3
Mean	2.907	4.426	3.185	4.685	2.567
Alpha	0.866	0.878	0.918	0.893	0.981
AVE	0.787	0.805	0.859	0.899	0.964

PLS-SEM with 5000 bootstrap iterations was employed. Out of the original sample, 5,000 random samples were generated and the model was assessed on them. The original model had a solid fit to the data (Chi-square=245.613, $p < 0.05$, SRMR=0.060, NFI=0.843). The model verification results are presented in Table 2. According to the T-statistics (T-stat), out of four predictors, two are statistically significant, PE and SI. Both scales have a positive impact on the behavioural intention, meaning that if the PE and SI increase, the BI will increase as well. The remaining predictors, EE and FC, are negative and not statistically significant. The difference between the original sample paths and bootstrap paths is low, as well as the path standard deviation, suggesting that the results are stable. In the proposed model, 54.9% of the variability of BI can be explained.

Table 2. Short UTAUT model verification results (Source: Authors' work)

Dependent	Predictor	Path coeff.	Mean path coeff.	Std.	T-stat	R ²
Behavioural intention	PE	0.463	0.464	0.098	4.738	0.549
	EE	-0.023	-0.018	0.068	0.334	
	SI	0.356	0.359	0.091	3.897	
	FC	-0.017	-0.020	0.048	0.352	

5 Discussion and conclusion

The results of the survey show that the young population in the Republic of Serbia are acquainted with the SE platforms, that they have used these platforms in the Republic of Serbia and abroad and they would be open to participating in sharing clothes and accessories. The short UTAUT model showed that Effort Expectancy (EE) and Facility Condition (FC) are not statistically significant predictors of behaviour towards platforms in the fashion industry. One possible explanation for the results is that Gen Z is highly ICT skilled, as well as confident and experienced in using platforms. Therefore, these aspects of a platform are not detrimental. What proved to be important for using such a SE platform is the perceived efficiency improvement of an individual's life, as well as recommendations from friends and family. If this sharing trend continues to grow, along with the improvement of durability and quality of materials and the development of the second-hand industry, it is obvious that significant changes will be made in the fashion industry. If the platform owners are interested in increasing their participation in sharing clothes and apparel, they should focus on creating promotional campaigns with elements of previous users' experiences on how they have made easier, cheaper and more sustainable shopping. The functionalities of the platform should be on a high level, but should not be extensively communicated, as those aspects of the platform are expected. In conclusion, the findings of this study underscore that Gen Z in the Republic of Serbia is open to using a platform for sharing clothes and apparel and suggest how it should be promoted. The directions of future research could include the sample extension

(conducting the survey in other cities in the Republic of Serbia or the region), application of the regular UTAUT model and conducting the multi-group SEM analysis to compare the models between groups.

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Crowdfunding in Serbia: What Do We Know So Far?

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Abstract. Crowdfunding has become a vital alternative financing method, gaining momentum across various sectors globally. Initially used for artistic projects, crowdfunding has evolved into a diverse ecosystem supporting entrepreneurial ventures, profit-driven initiatives, and philanthropic endeavors. Crowdfunding offers a powerful mechanism for organizations and companies to harness the collective wisdom, creativity, and resources of the crowd to achieve a wide range of goals efficiently and effectively. While crowdfunding in Serbia may not be as developed as in some other countries, there are clear signs of progress and growing interest in alternative financing options. With ongoing efforts to improve the regulatory framework, raise awareness, and support entrepreneurial initiatives, crowdfunding possesses the capacity to play an increasingly important role in the development of Serbia's economy and society.

Keywords. Crowdfunding, Group Financing, Crowdfunding platforms, Crowdfunding in Serbia.

1 Introduction

Crowdfunding is a rapidly growing phenomenon that has gained importance in recent years and is becoming increasingly prevalent in many different sectors and industries. Crowdfunding is particularly significant for startups because most banks and venture capital firms are often hesitant to provide loans to entrepreneurs in the early stages of their development (Bruntje & Gajda, 2016). They usually prefer to invest or lend once they are certain that the entrepreneur can repay the borrowed funds. On the other hand, crowdfunding allows startups to access funding directly from a diverse group of individuals who believe in their ideas, often providing a crucial source of capital in the early, riskier phases of their business journey. At the beginning of the development of crowdfunding, it was primarily used as a way to fund artistic projects, especially music projects. The first crowdfunding campaign dates back to 1997 when fans of British rock band Marillion raised \$60,000 via an online initiative to finance the band's reunion tour. Consequently, other artists in musical and other artistic fields also began to adopt crowdfunding (Bruntje & Gajda, 2016). In 2023, there are several hundred (489) crowdfunding platforms, with the highest number found in the UK (94), Italy (66), France (63) and Germany (46) (Bednroz, 2023). However, when considering the number of crowdfunding platforms per capita, the Baltic countries stand out – Estonia (22 platforms per 1 million people), Latvia (4.7) and Lithuania (3.9), while these figures for the previously mentioned countries are somewhat lower – UK (1.5), Italy (1.1) and Germany (0.6) (Bednroz, 2023). However, most Eastern and South-eastern European countries have a very small or non-existent number of crowdfunding platforms. The global crowdfunding market was valued at \$1.25 billion in 2022 and is anticipated to reach \$3.62 billion by 2030. North America dominated the global market with a share of 41.6% in 2022 (Fortune Business Insights, 2023). Crowdfunding is often defined as an alternative method of financing businesses or projects from many individuals, each contributing relatively modest amounts to sustain entrepreneurial ventures, profit-driven initiatives, or philanthropic endeavours (Wahjono et al., 2021). This alternative fund-raising activity is typically associated with an internet-based organisation and is often conducted by a crowdfunding operator, who is responsible for connecting project initiators or fund owners. Operators play a pivotal role in facilitating communication, allowing project initiators to interact with fund owners, investors, or debtors. This interaction involves the submission of business proposals or activity details and any information necessary for the operation or initiation of business ventures or new projects. A well-executed crowdfunding campaign can provide enough information to prevent entrepreneurship startups from failing. It is crucial to note that despite

this collaborative funding approach, the ultimate ownership of the projects, products, or ideas remains with the fundraisers and initiators (Wahjono et al., 2021).

The subject of this scientific paper is qualitative research on the different crowdfunding types and crowdfunding platforms operating in Serbia. At the beginning of the paper, in the introduction, the significance and concept of crowdfunding are described, along with the current global situation and trends related to crowdfunding. The first section of the research outlines the main characteristics, similarities, and differences among various types of crowdfunding. The second section focuses on the prevalence of crowdfunding in Serbia, its business models, and key participants. Finally, the paper concludes with the main findings and reflections on further development of crowdfunding in Serbia.

2 Crowdfunding Models

The focus of the first part of the conducted qualitative research is to explore different types of crowdfunding. Depending on what financiers expect as a return on investment, three different types of crowdfunding can be identified: Investment-based crowdfunding, Reward-based crowdfunding, and Donation-based crowdfunding (Živanović et al., 2023). Additionally, there is one more type of crowdfunding that is important to mention, which is called civic crowdfunding. All these models will be more closely presented in the paragraphs below.

2.1. Investment-based Crowdfunding

This form of crowdfunding implies that investors expect a corresponding monetary return. Depending on the nature and source of the monetary return realised by investors, Investment-based crowdfunding can be classified into three different groups: Equity-based crowdfunding, Royalty-based crowdfunding, and Lending-based crowdfunding (Živanović et al., 2023).

Equity-based crowdfunding represents the most complex form of crowdfunding, where entrepreneurs, through an online platform, issue securities to potential investors in exchange for funding their business ventures. This crowdfunding method operates on the principle of investors putting capital into a particular business and, in exchange, acquiring a share of ownership in the company (Bojković et al., 2022). Unlike other forms of group financing, in this case, the platform conducts a more rigorous selection of entrepreneurs who can advertise their venture and submit accompanying documentation. Platforms also define the type of security offered to investors (participating notes, convertible bonds, stocks), and the possibility of choice depends on the regulations in a specific country, the type of investors the platform aims to attract, and the level of risk the platform wants investors to bear. The most known crowdfunding platforms of this type are Crowdcube, CircleUp, Wefunder, and StartEngine (Bojković et al., 2022).

The second form of Investment-based crowdfunding is Royalty-based crowdfunding. This type of crowdfunding implies that financiers invest funds in projects, and in return, they receive a percentage of the revenue from the moment the project becomes sufficiently successful to generate income. The entrepreneur, together with the platform manager, predefines the revenue percentage for potential investors and the payback period for the investment (Bellefalmme et al., 2015).

The third form of Investment-based crowdfunding is Lending-based crowdfunding, also known as peer-to-peer lending. In this form of crowdfunding, investors provide funds to individuals, groups, or small businesses, expecting repayment after a defined period, with or without interest (Bellefalmme et al., 2015). This fundraising method serves as an alternative to borrowing from banks, with a significant difference being that there is a larger number of smaller investors on the investor side. Unlike banks, platforms do not bear credit risks and generate income by charging a commission. Both investors and borrowers benefit from the fact that the difference between the margin earned by banks and the commission charged by the platform is shared between users of the platform – borrowers have access to funds with lower costs, and investors earn yield in the form of interest as compensation for bearing credit risk. An example of a Lending-based crowdfunding platform is an American platform called Prosper, founded in 2005. Since then, this platform has provided more than \$25 billion for more than 1.4 million individuals (Prosper.com, 2024). The platform makes the selection of incoming loan applications through the credit score evaluation process. This process is based on the personal

characteristics of the applicant, the number of loan holders, the purposes for which the collected funds will be used, etc.

2.2 Reward-based crowdfunding

This crowdfunding model represents a particular form of group financing where investors are not motivated by receiving monetary returns but rather by supporting a specific campaign and consuming what results from that campaign. This type of crowdfunding is commonly used in creative industries (culture, arts, gaming, etc.). The project's end product serves as a reward for those who funded the project (Bellefalmme et al., 2015). This type of group financing is characterised by investors simultaneously acting as financiers of a particular project and as consumers of the product or service that represents the output of that project (prosumers). Investors are not solely interested in whether the project will generate positive returns; they are more interested in whether the project will meet their expectations in terms of the final output and whether it will align with their tastes and preferences, which are the reasons they supported the project. The most successful platform for Reward-based crowdfunding is an American platform called Kickstarter. From its founding in 2009, over 250 thousand projects were financed, and more than \$7.8 billion was collected. This platform is available in 25 countries (Kickstarter.com, 2024).

2.3 Donation-based crowdfunding

The last crowdfunding model is donation-based crowdfunding which is a group financing where investors do not expect any direct financial or material return for their contributions. Instead, they donate money to support the cause or project out of altruism, goodwill, or a belief in the mission (Bojković et al., 2022). Donation-based crowdfunding is often associated with charitable causes, non-profit organizations, social enterprises, or individuals seeking financial assistance for personal emergencies, medical expenses, community projects, disaster relief, or creative endeavours. Donors are usually informed about how their contributions will be used, and campaigners are often required to provide updates on the progress of their projects or causes. Transparency is crucial for building trust and credibility with donors.

2.4 Civic crowdfunding

Civic crowdfunding is the practice of gathering funds from a large number of citizens to implement projects of public interest, which typically entail benefits for a larger group of people than those who supported the implementation. Improving local parks, small green spaces in the neighbourhood, supporting local entrepreneurs or social enterprises, renovating sports fields, backing youth projects, and similar initiatives represent good examples of civic crowdfunding (Božović, 2021). Local governments can participate in civic crowdfunding, and they have various modalities available for their engagement, depending on the possibilities offered by the legislative framework. Donacije.rs is the only domestic crowdfunding platform which is dedicated to non-profit entities. Campaigns on this platform rarely gather large sums of money, but most projects are successful.

3 Crowdfunding platforms operating in Serbia

The second part of this qualitative research is focused on the analysis of crowdfunding and its main participants in Serbia. Crowdfunding in Serbia has become increasingly popular in recent years, although it is not as widespread or developed as in some other countries. The main reason for this is that there is a lower level of financial literacy among smaller enterprises, as well as insufficient awareness of the importance and opportunities offered by alternative funding sources. The second issue is related to the regulatory framework defined by the Foreign Exchange Law, which does not allow foreign investors to participate in crowdfunding campaigns, significantly reducing the number of potential investors. However, it seems that this problem could be partially overcome by introducing the Digital Assets Law (Živojinović et al., 2022). The biggest crowdfunding platforms in Serbia are Ventu.rs and Dobri Dabar.

Ventu.rs is a crowdfunding platform launched at the end of 2020 as a joint initiative of the consulting firm BDO Business Advisory and the company CONDA. Like all the platforms based on group financing, this platform connects financiers who invest their financial resources on one side with entrepreneurs and/or small businesses that use those funds to finance and develop their business ventures on the other side. Users of the platform have access to two financing models, depending on the type of company (Živojinović et al., 2022). The first model, intended for startups, involves financiers investing monetary funds in a business venture, thereby receiving a fixed interest rate of 7% annually and achieving the potential for additional returns through participation in the company's value growth. In other words, in addition to the primary interest, the investor receives a so-called stake in the investment with the increase in the company's value. This stake is virtual because it does not grant ownership rights and control to the investor but only the possibility of receiving additional returns. The second financing model, intended for small and medium-sized enterprises, is also based on a loan agreement where companies pay the investor a basic interest rate (usually 6% annually) and a bonus interest rate depending on the company's profit. In the first model, the repayment term for the loan is 5 to 7 years, while in the second model, companies repay the loan for 3 to 7 years. Although, depending on the type of contract, the loan may have a character closer to debt (second model) or a character more similar to investing in equity capital (first model), it is essential to emphasise that in neither of these two cases do investors become co-owners of the assets, nor do they gain the right to control and manage the company. The funds will be returned to the investors if the companies do not reach the targeted amount through the platform. Ventu.rs also conducts detailed verification and selection of business ventures/ideas for which a campaign will be launched on the platform, monitors the entire process of financing, and, together with its partners, provides expert and administrative support in that process. The platform charges a commission for its services in the form of a certain percentage of the raised financial resources. So far, six campaigns – Bubaja, Forest Secret, Autology, Kuća od blata – Mir Media, PetKlub and DB Taktil d.o.o. – have been funded through the Ventu.rs platform, raising a total of €791,800 from around 340 investors (Ventu.rs, 2024).

Dobri Dabar is a Serbian crowdfunding platform that the Loud Crowd Association launched with the support of the German-Serbian initiative for sustainable growth and employment. Dobri Dabar started operating in February 2022. In accordance with the platform's name, its focus is on initiatives that raise awareness about sustainable development, environmental care, and vulnerable social groups. Specifically, the platform supports the following areas: regional development and employment support, creating and protecting a better environment, creativity in culture and arts, science and research development, renovation, protection and development of spiritual and cultural values, civil society development, human rights and fundamental freedoms protection, children and youth rights protection, organisation of events of general significance and education development (Živojinović et al., 2022). The platform provides options for fixed or flexible project financing. Fixed financing means the campaign must reach the target amount to receive the funds. Since the platform is free, if the targeted amount is raised, it is transferred to the campaign owners minus transaction fees for credit card payments. In the case of an unsuccessful campaign, the funds are returned to the financiers. Most campaigns can only use this form of financing for two reasons: it reduces the risk of the project's failure and increases motivation to work on the campaign. Flexible funding is suitable for projects with measurable goals. So far, eight campaigns – Beogradska pčela, To finish a movie called Bube, Duh šume, Festival 'Novi balkanski ritam', Mali seoski park, Podrži Highwaystar – Podrži kulturu, ŠARMANI – fundraising for recording an album called "Mužički omnibus", Za još jednu volonTuru – have been funded through the Dobri Dabar platform, raising a total of RSD 2,718,028 (Dobri Dabar.com, 2024).

4 Discussion and Conclusion

In conclusion, this qualitative research provides insights into main types of crowdfunding: Investment-based crowdfunding, Reward-based crowdfunding, Donation-based crowdfunding and Civic crowdfunding. Also, the paper provides insights into two prominent crowdfunding platforms in Serbia, Ventu.rs and Dobri Dabar, which cater to different funding needs. Ventu.rs, operational since 2020, focuses on investments in startups through subordinated loans, fostering entrepreneurship while ensuring investor protection. On the other hand, Dobri Dabar, launched in 2022, focuses on sustainable development initiatives, offers flexible financing options, and fosters community engagement. Overall, crowdfunding in Serbia has the potential for further development driven by innovative platforms,

supportive initiatives, and evolving regulatory frameworks, poised to empower entrepreneurs and investors and, finally, have a positive impact on socio-economic growth.

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Unveiling the Green Potential: Exploring Sustainable Value Creation in Serbia's Sharing Economy

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Abstract. *Sharing economy is experiencing significant growth worldwide driven by a decrease in consumer confidence, substantial progress in the IT sector, and the rise of novel technologies. Although the sharing economy holds promise for promoting sustainable development and providing numerous avenues for tackling practical sustainability concerns, there is not a lot of empirical researches scrutinizing the sustainability of business models within sharing economy. The aim of this study is to introduce a methodology for assessing and analysing the sustainability of sharing economy business models, providing valuable insights into the state of sustainable value creation within sharing economy enterprises specifically in the Republic of Serbia. Key sustainability factors were utilized to gauge the level of business models sustainability, and the application of the established model yielded significant findings regarding the generation of sustainable value, underscoring its relevance and encouraging policymakers to sustain sharing economy support initiatives for its inherent sustainable attributes.*

Keywords. *Sharing economy, sustainable development, sustainable value creation analysis, business models*

1 Introduction

In the dynamic landscape of the global economy, the sharing economy has emerged as a potent force shaping future development. The rise of the sharing economy, facilitated by digital platforms for peer-to-peer exchanges, has significantly altered conventional consumption behaviours. This trend reflects a move towards collaborative consumption, prioritizing resource efficiency, community involvement, and accessibility rather than ownership. By empowering people to earn from idle assets and cultivating trust between unfamiliar parties, the sharing economy delivers not only economic advantages but also promotes sustainable consumption habits and interpersonal relationships. Consequently, it influences broader societal perspectives on ownership and consumption (Porter, M. E., & Kramer, M. R., 2011; Acquier, A. et al., 2017).

According to this, many sustainable development initiatives were conducted by modern cities and countries through development and supportive access to sharing economy. Regarding the Republic of Serbia, reports D1.1. and D1.2. of project PANACEA highlight the promising outlook for the Serbian sharing economy, supported by a robust legal and policy framework conducive to its growth. However, the reports also emphasize potential challenges of sharing economy in Serbia, including a lack of interpersonal trust – a cornerstone of the sharing economy – and concerns regarding digital technologies.

While extensive researches explore business models within the sharing economy, questions related to their long-term sustainable value creation analysis remain inadequately addressed. This paper aims to fill this crucial gap by analysing the sustainable value creation potential of sharing economy business models, focusing on Serbian companies, which is presented through a comprehensive literature review and methodology description, leading to key findings and concluding remarks highlighting future research avenues.

2 Literature review

To gain deeper insight into the research context, this section of the paper offers a concise review of literature pertaining to the concepts and attributes of the sharing economy, the various business models employed within it, and conceptual frameworks utilized to gauge the sustainable value generated by these models.

2.1 Understanding the definition and concept of sharing economy

The concept of the sharing economy, characterized by the collaborative consumption of underutilized resources facilitated by online platforms, has sparked considerable debate within academic circles. Divergences in defining this multifaceted phenomenon have emerged, leading to nuanced perspectives on its impact and implications.

Proponents of a narrower definition, exemplified by *Cockayne* (2016), *Benkler* (2004) and *Frenken & Schor* (2017), emphasize the optimization of resource utilization through online platforms. In their view, platforms like Uber, which solely aim at value capture through a professional taxi service, fall outside the boundaries of the true sharing economy due to their lack of genuine resource-sharing (*Acquier et al.*, 2019). However, advocates of a broader definition, including *Lessig* (2008), *Habibi et al.* (2016) and *Munoz & Cohen* (2017) encompass both business-to-peer and peer-to-peer arrangements, integrating both non-market and market-driven mechanisms. This expansive definition allows platforms like Uber to be considered part of the sharing economy, albeit with potential concerns (*Acquier, A. et al.* 2019).

Despite the challenges of interpersonal trust and legal issues, the sharing economy continues to experience significant growth and demonstrably offers various socio-economic benefits. However, there are also numerous critics such as *Belk* (2014) who labels it "pseudo-sharing," highlighting the potential for exploitation and commodification disguised as collaborative consumption. Critics further denounce the "parasitic development logic" of platforms, which they see as extending neoliberal practices into unregulated and potentially exploitative labour markets (*Slee*, 2015).

Key participants in the sharing economy include users, platforms and resource/capacity providers. However, in a broader sense, the sharing economy includes additional stakeholders such as partners, government institutions, competitors and the wider community, each driven by different motives for participation (*Zhu, X., & Liu, K.*, 2021). Moving forward, the varying definitions and perspectives surrounding the sharing economy reflect its complex and evolving nature. While debates persist regarding its boundaries and impacts, it is evident that the sharing economy is a substantial both social and economic phenomenon, carrying implications for diverse stakeholders.

2.2 Business models of sharing economy

The conceptualization and dissemination of sharing economy business models are characterized by significant variability. In accordance with findings from the PANACEA project and the scholarly contributions of *Treľová, S.* (2021), business models within this domain can be categorized as:

- those in which movable or immovable property is assigned for a certain period of time,
- those in which property-based services are provided, which means that property ownership with wine enables the delivery of services and
- business models in which individuals provide services based on their knowledge and skills.

A defining characteristic of the sharing economy is its inclusive nature, encompassing both profit-driven endeavours and non-profit initiatives. Consequently, *Ritter M. & Schanz H.* (2019) delineate sharing economy business models based on their mechanisms for creating and capturing value into the following classifications: Subscription-based models, Unlimited platforms, Singular transaction models and Commission-based platforms.

Furthermore, *Acquier, A. et al* (2019) contribute to this discourse by presenting an additional categorization based on the methods of creating and capturing value. Based on this division, it can be distinguish four type of sharing economy business models, these are: *Commoners* (unlimited access to public resources and capacities), *Mission-driven platforms* (intermediaries between peers, serving to

advance societal causes), *Shared infrastructure providers* (ventures oriented on profit that generate value by providing paid and impermanent access to a centralized base of branded resources) and *Matchmakers* (decentralized market transactions by connecting peers) (Acquier, A., Carbone, V., & Massé, D., 2019).

In summary, the sharing economy encompasses a diverse array of business models, each characterized by unique approaches to value creation and capture, ranging from temporal property assignments to skill-based service provision and beyond.

2.3 Sustainable value creation factors of business models in sharing economy

The conventional paradigm of business models traditionally emphasizes value creation solely within the realm of economic gains. However, as environmental concerns take on greater significance, there emerges a paradigm shift wherein value creation is reconceptualized through the lens of sustainability. This entails considering not only economic benefits but also social and environmental dimensions which together builds the famous triple-bottom model of sustainability (Sadiq, M. et al., 2023).

The business models inherent in the sharing economy exemplify a notable instance of sustainable value creation owing to their inherent characteristics (Laukkanen, M., & Tura, N., 2020). Nonetheless, substantiating this claim from environmental and social perspectives beyond mere economic metrics presents a challenge. One approach to addressing this challenge is through sustainability evaluation, which involves assessing the sustainability implications of various initiatives, encompassing policies, plans, programs, projects, laws, or ongoing practices (Pope, J. et al., 2004).

An extensive examination of the current academic literature regarding the sustainable value creation within sharing economy business models culminates in the development of many conceptual framework, and the adapted framework selected for the purposes of conducting this research is shown in Figure 1. This framework serves as a blueprint for gauging the potential for sustainable value creation. Moreover, to ensure the framework's comprehensiveness, it is cross-referenced with all United Nations Sustainable Development Goals, which broadly tackle sustainability challenges on a global scale. By encapsulating diverse facets of value creation across multiple dimensions of sustainability, this framework furnishes a foundational tool designed to assess the sustainability of sharing economy business models.

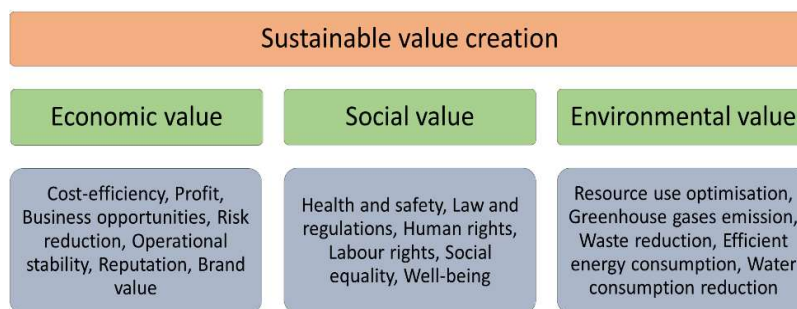


Figure 1. Framework for sustainable value creation assessment of sharing economy business models (Sources: Daunoriené, A. et al. 2015; Laukkanen, M. & Tura, N. 2020)

3 Research methodology

The data collection took place in Serbia in February 2024, employing an e-survey which is recognized for its efficacy in data acquisition, owing to its capacity for transmitting extensive information and facilitating swift response cycles (Stanimirovic et al., 2023). The survey was sent to all sharing economy companies operating in Serbia that were mapped in the PANACEA project reports.

Comprising three distinct constructs, the survey was meticulously designed to capture pertinent information pertaining to companies operating within the sharing economy paradigm. The first construct delineates fundamental details about the surveyed companies' business models (type of business and capturing value models) which is aligned with the findings of the literature review. The second construct evaluates the surveyed companies' contribution to UN sustainable development goals, with questions

crafted from relevant literature, including the work of *Sadiq, M. et al. (2023)*. The third construct focuses on understanding how these companies generate sustainable value within their business models, aligning its questions with factors outlined in the adapted conceptual framework shown in Figure 1.

Respondents filled out the questionnaire anonymously via the MS Forms platform. Subsequently, the collected data were subjected to rigorous analysis using MS Excel radar chart to analyse and visualize the collected data based on the dimensions of conceptual framework explained in the literature review. Furthermore, sustainability of business models was analysed in two ways, firstly according to the type of business model and secondly according to their affiliation to the industry sector.

4 Results

As per the findings of the PANACEA project, the Republic of Serbia hosts a diverse array of more than 50 sharing economy enterprises. It's important to note that this roster is not exhaustive but rather offers a snapshot of the current landscape, reflective of the dynamic and burgeoning nature of the sharing economy in Serbia. Predominantly, notable number of players in Serbian sharing economy operates in the accommodation and transportation sectors include Airbnb, the domestic equivalent of Uber known as CarGo, and the ride-sharing platform BlaBlaCar (PANACEA, 2022).

The survey, tailored specifically for this research, was distributed to all sharing economy enterprises outlined in the D.2 report of project PANACEA, providing comprehensive coverage of the targeted economic landscape. However, the responses received were garnered from a subset of companies, totalling 27 in number. The outcomes of the assessment pertaining to analysed business models sustainable value creation are elucidated in Figure 2.

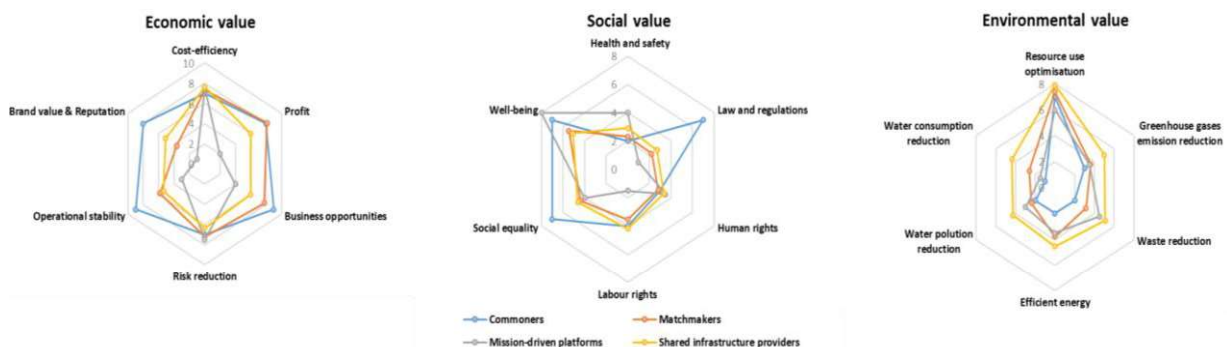


Figure 2. Results of business models sustainable value creation assessment (Source: Authors' work)

Within the examined sample, a substantial proportion of companies in Serbia, amounting to 48%, adopt the *Matchmakers* model, while 40% opt for the *Shared Infrastructure Providers* model. In contrast, the utilization of the *Commoners* and *Mission-driven Platforms* models is less prevalent, suggesting a predominant emphasis among sharing economy enterprises in Serbia on fostering economic utility. This observation aligns to some extent with the findings of the PANACEA project reports. In addition, sharing economy companies in Serbia operate under commission-based value capturing schemes, with unlimited platforms schemes being the least favoured. Subscription and transactional models are employed with equal frequency of 22%.

5 Discussion and conclusion

Based on the presented data, a clear trend emerges wherein business entities implementing the *Commoners* model exhibit the highest level of sustainable value creation, closely followed by those employing the *Matchmakers* model, which yields a similar score. Conversely, companies operating under the *Mission-driven Platforms* model tend to achieve the lowest sustainable value creation. Notably, significant economic value is realized across all models, particularly in terms of Cost-efficiency, Profit, Business opportunities, and Risk reduction factors. Within the economic value sphere, the *Commoners* and *Matchmakers* models demonstrate leadership, whereas *Shared Infrastructure*

Providers yield slightly lower results, and *Mission-driven Platforms* generate the least economic value. These findings corroborate earlier research conducted by *Acquier, A. et al. (2019)* and *Laukkanen, M. et al. (2020)*.

When considering the generation of social value, firms that adopt the *Commoners* model exhibit notable performance, while other models generally achieve an average rating of around 3.5 in this domain. Social equality and well-being are the most realized factors. Conversely, regarding environmental value creation, *Shared Infrastructure Providers* achieve the highest results, followed by *Mission-driven Platforms* and *Matchmakers*, whereas *Commoners* demonstrate the lowest performance. Factor of optimal resource utilization garners the highest score of 7.5, while other factors receive scores ranging from 3 to 4. These findings echo those of the *Laukkanen, M. et al. (2020)* and *Sadiq, M. et al. (2023)*, yet this study offers a novel perspective by analysing value creation not only according to business models but also across operational sectors, thereby aligning with the UN's sustainable development goals.

Following the mentioned, sharing economy companies in Serbia predominantly generate economic value across operational sectors, followed by social and environmental ones. Notably, the finance sector contributes the most to economic value factors, while the transport and accommodation sectors play pivotal roles in fostering social and environmental value factors. Overall, the accommodation and transport sectors appear as leaders in terms of sustainable value creation, while the factor of optimal resources use stands out most among the representatives of all operational sectors, which is in accordance with the essential ethos of the sharing economy.

Moreover, all findings presented are fortified by an examination of the sharing economy's impact on achieving the UN Sustainable Development Goals (SDGs) within Serbia. Among the SDGs, the analysis reveals that sharing economy companies in Serbia mostly contributes to certain goals, such as SDG 8 (Decent work and economic growth), SDG 9 (Industry, Innovation and Infrastructure), SDG 11 (Sustainable cities and communities) and SDG 17 (Partnership for the goals), whereas other goals, notably those related to SDG 2 (Zero hunger), SDG 14 (Life below water) and SDG 15 (Life on land) are less achieved by these companies which is in accordance with findings of *Sadiq, M. et al. (2023)* and *Petrović et al. (2022)*.

To conclude, conducting this research, a clear trend emerges wherein various business models implemented in Serbia demonstrate sustainable value creation. Considering the predominant utilization of *Matchmakers* model by the majority of Serbian sharing economy enterprises, notably exemplified by prominent entities like AirBnB, BlaBlaCar, and CarGO, it can be inferred that the sharing economy in Serbia fosters sustainable value creation especially in economic and social area. Despite the developmental phase of the Sharing Economy in Serbia, significant strides are anticipated in the future. To realize this potential, country decision makers have to conduct greater supportive incentives for domestic start-ups in less represented operational sectors of sharing economy, particularly those embracing the *Commoners* models which generates most sustainable value and which is least utilised by enterprises from Serbia. Also, strategic framework of sharing economy in Serbia should consider fostering initiatives of creating a favourable business environment, and market regulation and initiatives that could increase trust and knowledge among citizens in the Sharing Economy domain in order to address the challenges of sharing economy discovered by project PANACEA.

Finally, it is worth noting the limitations of this research, suggesting that future research efforts should focus on overcoming these challenges. These limitations are: a limited sample within Serbia and potential bias in the subjective assessments of company representatives, but also limitations that arose due to the reduced space for the research results presentation, such as: a limited literature review, a reduced number of charts and diagrams results presentations, and a reduced number of more specific details about the Serbian sharing economy context in order to deepen the reader's understanding of local challenges and opportunities and to broaden the discussion on the implications of paper's findings for policy and practice, particularly in addressing identified sustainability challenges and opportunities.

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The Role of Trust: The Cornerstone of Sharing Economy Services

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Abstract. *Sharing economy services have taken a significant place in the economies of countries around the world in the past decade. The main questions that arose from the way this type of service is used concern the decision-making process by consumers, legal norms, risks, benefits, the relationship between providers, users and electronic platforms, the influence of intermediaries and the like. This paper aims to focus on the factors that influence the consumer decision to use sharing economy services, with an emphasis on the trust factor as one of the main determinants of consumer behaviour. Trust in sharing economy services is built between consumers and service providers, as well as between consumers and providers in relation to electronic sharing platforms, respectively. The paper will present an overview of research that has so far confirmed the influence of trust, as well as an explanation of the construct.*

Keywords. *Sharing economy, Trust, Consumer behaviour, Determinants of service usage in sharing economy, Trust in service provider*

1 Introduction

Modern trends in the market have led to the development of new technological solutions, innovations in the field of production, as well as in the way of consumption and fulfilling the needs and wants of consumers. The way in which a certain need is satisfied depends on a number of different factors. Many of these factors stem from the past of the individual, his experiences, social and cultural environment, (Solomon et al., 2015, p. 180). Although the needs of individuals can be similar, almost identical, the way and possibilities for their satisfaction can be completely different at the same time. One of the ways to satisfy emerging needs, recognized by consumers, is mutual sharing of goods and services. The sharing of resources between people has essentially existed since the earliest beginnings of human community development. Nevertheless, the sharing economy is one of the phenomena that has experienced its development in the last few years and is taking a share in numerous market segments with a striking growth rate.

The sharing economy can be defined as "a socio-economic ecosystem that in most cases uses information technology to connect different participants - individuals, businesses, authorities and others - to share or access different products and services and to enable shared consumption". (Laamanen et al., 2018, p. 213)". The novelty that separates the phenomenon of the sharing economy from the traditional sharing of goods and services between people, and which essentially opens the possibility for its expansion within commercial markets, is sharing between people who have never met before, or as defined by the author Schor, (2014, p. 7) "sharing among strangers". The services and products that are offered, which are exchanged on this market, by their very nature deeply encroach on the privacy of their owners as well as those who use these goods and services in this way.

As sharing has been identified as a fundamental way of consumer behaviour that requires additional research on people's motives to participate in sharing (Belk, 2010; Bucher & Fieseler, 2015), the question arises about understanding different motives for consumer behaviour, as well as different

perspectives from which observes the named phenomenon. One of the important issues of the sharing economy is the terminology used in this market, i.e. the correctness of its use. For example, whether renting or providing services can be considered "sharing", (Schor, 2017, p. 264). According to the same author, Anthony Kalamar discussed that this type of exchange has the effect of crowding out true "sharing", as well as that profit organizations use the resulting situation for so-called sharewashing, that is, they use positive associations related to "sharing" to cover up own interest activities, (Schor, 2017, p. 264). Proponents of the positive and negative impacts of the sharing economy on the environment in which this phenomenon takes place differ in their views, but several basic impacts stand out and there is general agreement regarding them. Growing urbanization contributed to a significant number of participants of the sharing economy being in close proximity and forming a "critical mass" for the functioning of the sharing economy. As the authors Basselier et al. (2018, p. 60) state, many activities and initiatives in the sharing economy offer a solution and a specific response to the "frustration" that comes with living in a large, overcrowded city. Among the first positive impacts that were highlighted as a strong driving force behind the development of the sharing economy was the impact on the environment. First of all, the possibility to replace the individual ownership of goods with the shared use of resources, at the moment when they are needed, contributed to the idea of reducing the excessive consumption of energy and natural resources. This paper aims to show the influence of trust on consumer behaviour in the area of the sharing economy, as one of the decisive factors in making a purchase decision. Given that in many studies, determinants such as trust were highlighted as significant, the paper will attempt to consolidate the presentation of previous studies with an indication of the influence and effects of the construct.

2 Trust and consumer behaviour in the sharing economy

Throughout the literature, the view is that consumer behaviour in the sharing economy is generally still an under-researched area (Gazzola et al., 2018; Böcker and Meelen, 2017; Bucher et al., 2016). Although, based on the general view, one would think that the sharing economy is a phenomenon that has only recently emerged, some data show that as early as 1948 there was a form of vehicle sharing in Zurich, and that during the 1980s this form of exchange became very popular in areas of Northern Europe, (Zhuikova, 2017). Today the impact of the sharing economy is being considered in the mobility, i.e. transportation sectors (such as ride sharing or vehicle sharing), in the space management sector (where short-term rental of residential and commercial spaces appear), in the work and employment sector, (Ganapati & Reddick, 2018, p. 78), as well as in the service sectors of craft works, production systems, tools, hospitality, fundraising, the food sector, education and many others. The benefits that society has from the services of the sharing economy are diverse. In order for consumers to freely access the use of sharing services, sharing platforms as well as the community of users organized within a certain platform must provide to them the necessary level of trust and certainty that transactions will really be carried out in the way they were presented before use. The trust as phenomenon can be defined as "the willingness of a consumer to be vulnerable to the action of the sharing economy" (Leong et al. 2024). Some sources define it as a belief of providers that the platform is an honest and reliable intermediary in the transaction, (Rossmannek et al., 2024). Accordingly, the importance of trust for the sharing economy lies in the fact that it is precondition for consumers to become a part of the transactions which are intangible and risky. Also, lack of widespread legislative creates increased risk for all parties involved in transactions. Questions about data protection are raised for the platforms creating another reason for the necessity of trust, (Cicognani et al., 2024). Even more, the social interaction among users, or between users and service providers is influenced by trust and low risk perception. Literature recognizes different kinds of trust, and different relations in sharing economy. The trust can be perceived between customers and the online platform, between providers and customers, providers and platforms, and customers and products or services. Providers are those who usually look for information about customer risk and misbehaviour from internal and external sources, (Rossmannek et al., 2024). In any kind of business relations trust management is vital for the recovery of the misunderstandings. Sharing economy platforms are not different in this regard, (Lu et al., 2020).

One of the biggest sources of concern expressed by platform users is precisely the concern of receiving low-quality services and products for which the value gained from shared consumption does not exceed the costs of the effort invested to make sharing happen (Tussyadiah, 2015, p. 822). Community trust builds a stable environment for consumers. Such a community of users is constantly increasing the

number of members, thereby increasing its strength, on which the platforms rely for their own growth. Authors Hwang and Griffiths confirmed that specific dimensions of value perception, such as utility (functional and economic benefits) and hedonic (pleasure, comfort, positive feelings and enjoyment) dimensions have a positive relationship with the attitude to participate in collaborative consumption, but at the same time symbolic dimensions (such as improving social sustainability) do not make this positive connection, (Brkljač, 2021). Due to the lack of elements present in traditional transactions, which provide security when using services and during the exchange process, as well as insufficient legal regulation of the sharing economy market, asymmetric information, but also the relative novelty of sharing services (which is why they create a feeling of insecurity and uncertainty in consumers the outcome of the transaction), trust often becomes the basic support for the development of the sharing economy market. The author Botsman, (2011) in her book expresses her belief that one of the four basic principles on which the sharing economy and collaborative consumption is based, is trust between strangers. Online platforms, compared to traditional businesses, face at least three additional challenges in the area of trust: a) participants in an online environment are anonymous to one another and separated from their identities in real life, b) physical interaction from a traditional environment is often impossible in the online environment, c) sharing platforms collect a large amount of data about users and their activities, (Watt & Wu, 2018, p. 11). The same authors define trust-building mechanisms as tools used by online platforms in order to overcome asymmetric information between market participants and to facilitate transactions (Watt and Wu, 2018, p. 12). Authors Hawlitschek et al., (2016) developed a research model in their work to determine the role of trust in C2C (consumer-to-consumer) relationships on sharing economy market platforms. This model is based on the so-called "3P" of trust: (Peer, Platform, Product), i.e.: a) trust among users; b) trust directed towards the service sharing platform; and c) trust directed towards the product that is the subject of the transaction. The general conclusion of this study is that all three "P" elements of trust play a crucial role in positively influencing consumers' intention to use sharing economy platform services. Trust represents one of the basic determinants of user satisfaction with the service in the sharing economy (Gonzalez-Padron, 2017, p. 88). According to the author Gonzalez-Padron, (2017, p. 88) 69% of service users do not trust service-sharing platforms until they are recommended by someone they trust. Such data emphasize the need for the existence of systems and mechanisms that will build trust between users of sharing economy service platforms on solid foundations, based on user experience, previous behaviour, material assurances, social reputation as well as on other dimensions.

One of the core elements necessary to carry out a sharing transaction, which affects the creation of the trust, is the information and personal data of the platform users (Teubner & Flath, 2019, p. 214). This data is usually found on public and meaningful online personal profiles of users, which in most cases include real names of users, place of their residence, personal description of individuals, photos, year of birth, level of education and many other data, (Teubner & Flath, 2019, p. 214). The issue of trust building mechanisms on P2P platforms, as a prerequisite for the realization of transactions between users, was analysed in detail in the work of Teubner and Dann, (2018). The aforementioned authors classified the mechanisms for building trust and managing reputation into the following categories: a) transaction-based assessments; b) socially rich and expressive user profiles; c) identity verification mechanisms; d) implicit information, (Teubner & Dann, 2018, p. 2). In addition to the mechanisms for rating and ranking users of the platforms, in building mutual trust, the participants of the market of sharing services also use mechanisms such as insuring people and property, providing guarantees for services and products used in the sharing transaction, paying for services by checks and bills of exchange, as well as similar elements to ensure collection claims, as well as mechanisms for ensuring user privacy, (Teubner and Dann, 2018, p. 2).

According to author Lee, (2015, p. 147) trust is an elusive concept without a unique and consistent definition. Trust is considered to be a social binding element that increases efficiency, lowers transaction costs, reduces complexity, enables cooperation, and contributes to the maintenance of social order, (Lee, 2015, p. 148). Trust among users of sharing platforms is formed in a number of different ways, whereby their effect is cumulative and leads to the final realization of services on the sharing market. Service-sharing platforms rely on active mediation in solving their users' problems, user reviews, online forums and other trust-building mechanisms, in order to eradicate negative and undesirable behaviour of platform users. Depending on the adopted theoretical framework, trust as a determinant of consumer behaviour in the sharing economy was examined by numerous other authors: (Amaro et al., 2019; Hawlitschek et al., 2018; Möhlmann, 2015, Brkljač, 2021). It is mostly emphasized that trust in other users and familiarity with the basic ideas and paradigms of the sharing economy are important bases

for using the observed services (Möhlmann, 2015; Hawlitschek et al., 2016; Teubner & Dann, 2018). Additionally, Barnes and Mattsson, (2017) confirmed in their research that trust is a key determinant of consumers' intention to recommend a sharing service to their friends, while in the work of Arteaga-Sánchez et al., (2018) trust was identified as the most influential determinant of user satisfaction.

3 Conclusion

The most of the presented studies showed in the observed markets of the sharing economy that trust is one of the most important determinants when consumers make decisions whether to use sharing services. The consumer decision-making process in this sense is complex and demanding because consumers are facing a challenge with which they have not previously had contact, as well as due to the fact that it is a relationship between individuals, with goods that are privately owned and over which there is the possibility of making intentional or unintentional damages. In addition to all that, trust is further undermined by the fact that the legal regulation of sharing economy services is still insufficiently developed in most countries of the world, that is, it does not provide adequate protection to all participants. Importance of the trust is clear, whether for the consumers, providers or the platforms. Next step in defining marketing strategies and tactics for overcoming resistance and gaining trust among consumers could be conducting a research of the level of trust expressed in consumers' reviews of sharing economy platforms and services, and comparing the results with the aforementioned studies on the impact of trust.

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Trust Dynamics: Shaping Trust in User Reviews Within Serbia's Sharing Community

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Abstract. *This research explores the influence of socio-demographic factors and the frequency of sharing economy service usage on trust in reviews within sharing economy platforms in Serbia. Conducted through an online survey, the study unveils distinct gender variations in trust, indicating lower trust levels reported by men. Additionally, it identifies age-related patterns, showcasing higher trust among younger individuals and students, with a decline as age increases. Notably, a positive relationship was found between the frequency of using sharing economy services and trust in reviews. Conversely, individuals who have never engaged with these services exhibit significantly lower trust levels, underscoring the pivotal role of initial interactions. This paper can serve as a guide for shaping trust in sharing economy service reviews in Serbia, providing valuable insights for platform operators and policymakers navigating the dynamic landscape of the sharing economy.*

Keywords. *Sharing economy, Trust dynamics, Usage frequency, Socio-demographic characteristics, Hypothesis testing*

1 Introduction

In recent years, the sharing economy has become a dynamic and transformative force, reshaping traditional models of consumption and commerce. This phenomenon, driven by technological advancements and changing societal attitudes, has created a new era where individuals can leverage their assets for personal and collaborative consumption. This shift from ownership to access is not merely a change in business models but a cultural and economic paradigm shift (Sundararajan, 2016). The universality of the sharing economy has sparked numerous disagreements and debates over the appropriate terminology. However, judging by its trajectory over time, it has transcended the status of merely being "another idea of sustainable development." Instead, it has evolved into a central and independent topic for scientific inquiry, professional discourse, and public engagement (Živojinović et al., 2022).

An interesting subject is the role of trust in the sharing economy. Trust is the cornerstone of the sharing economy, supporting the interactions between users and providers on digital platforms. In this context, individuals must rely on the reputation systems and reviews embedded in these platforms to make informed decisions about whom to engage with (Akhmedova et al., 2021). The level of trust influences users' willingness to share assets, services, or experiences with strangers, shaping the success and sustainability of the sharing economy (Räsänen et al., 2020). Understanding the dynamics of trust is crucial for both platform operators and users, as it directly impacts participation, collaboration, and the overall effectiveness of shared resources.

This research aims to explore how socio-demographic factors and the frequency of sharing economy services usage impact trust in user reviews on sharing economy platforms among respondents in Serbia. Building upon previous research that has highlighted the significance of trust in the sharing economy, particularly within emerging market contexts like Serbia, this paper contributes by focusing on the impact of socio-demographic factors and the frequency of sharing economy service usage on trust in user reviews. Notably, there is a scarcity of research conducted in Serbia within this domain, emphasizing the novelty and importance of this study. By addressing this gap in the literature, this study aims to provide valuable insights into the dynamics of trust formation in sharing economy

reviews specifically within the Serbian context. This research not only enhances understanding of trust mechanisms within the sharing economy, but also offers practical implications for platform operators and users alike, ultimately contributing to the sustainable development of the sharing economy ecosystem.

The research methodology involves a survey-based approach, with data collected through a questionnaire. The subsequent analysis uses nonparametric tests, allowing for a structured examination of the mentioned variables. Following the introduction, the subsequent section is dedicated to a literature review. The third section provides details on the research methodology and data collection, while the fourth section presents the research results. With a focus on the results, the final segment engages in a discussion that shapes the final conclusion.

2 Literature Review

The literature surrounding the role of trust in the sharing economy is a dynamic and significant field of study. Recent research has delved into the complex dynamics of trust, recognising its important role in shaping user behaviour within sharing economy platforms.

The research by Li and Wang (2020) on peer-to-peer accommodation platforms like Airbnb and Xiaozhu uses structural equation modelling (SEM) to investigate online trust-building mechanisms. Results reveal that safety-related mechanisms and reviews positively impact providers' trust in the platform, which, in turn, influences trust in consumers. This research contributes to enhancing trust mechanisms in the sharing economy. The study by Gu et al. (2021) explores trust and risk perceptions in the sharing economy, which is crucial for collaborative success. With 1,336 respondents, the study employs structural equation modelling (SEM) to identify key factors influencing customer trust and risk perceptions. The research confirms the moderating role of social identity threats and establishes links between trust and risk perceptions and positive outcomes, including customer satisfaction and positive word-of-mouth. Chen et al. (2022) researched customer trust in China's home-sharing economy. Their research establishes a positive link between trust, engagement, and loyalty. Acting as a mediator, customer engagement is influenced by trust, while the study also investigates artificial intelligence's potential negative impact on host trust, customer engagement, and loyalty. This study provides valuable insights for marketing and artificial intelligence in the home-sharing industry.

In their study, Räsänen et al. (2020) conducted a systematic literature review on trust-building in the sharing economy, highlighting its vital role in sustainability and collaborative success. They identify reputation systems, ratings, and reviews as key technological tools for fostering trust among users and platforms. Their work offers a theoretical model and practical resources beneficial for both researchers and practitioners, enhancing understanding of trust mechanisms in the sharing economy. Integrating their findings enriches literature review by emphasizing the significance of reputation systems and reviews in building trust within sharing platforms. Overall, their research emphasizes the crucial role of trust in shaping consumer decisions and promoting cooperative behaviors in peer-to-peer transactions.

While numerous studies examine trust within the sharing economy, there is a notable gap in research focused on emerging markets like Serbia. Only a minority of studies delve into trust dynamics in such contexts, such as work by Živojinović et al. (2023) exploring the impact of online information and reviews on participation in the sharing economy, specifically carpooling. However, neither of these works deeply investigates socio-demographic factors, highlighting a significant opportunity for further research in this area, especially within emerging market contexts like Serbia.

3 Case Study Setting

To explore the impact of socio-demographic factors and frequency of using sharing economy services on trust in user reviews on sharing economy platforms, an anonymous survey was conducted using the Google Forms platform in January and February 2024. The comprehensive survey, consisting of 12 structured questions, gathered socio-demographic information, including gender, age, and employment status. Additionally, the survey delved into various facets of trust within the sharing

economy, examining both the degree and manner in which individuals engage with shared economy services. Trust in reviews on sharing economy platforms was evaluated using a 10-point Likert scale. This aspect aimed to capture varying degrees of trust attributed to user reviews. Additionally, participants' involvement with sharing economy services was evaluated based on a frequency scale, ranging from never to daily engagement.

The Mann-Whitney and Kruskal-Wallis tests were chosen as analytical tools for this study due to their suitability in assessing non-parametric data and group comparisons. In the context of examining trust in reviews on sharing economy platforms, where data do not conform to a normal distribution, these tests offer robustness and reliability. Version 23 of SPSS was used to conduct this analysis.

4 Results

4.1 Sample description

In this study, 209 respondents residing in the territory of Serbia participated. The gender distribution within the sample covered showed that 142 women (67.9%) and 67 men (32.1%) took part in the study. This distribution aligns with findings by Smith (2008), asserting that women are often the predominant participants in survey research, possibly due to their higher engagement or interest in such studies. Regarding age distribution, the survey reveals that 41.6% of respondents fall within the 18-24 age group, with an additional 34% belonging to the 25-34 age bracket. This indicates that slightly over 75% of participants are under 34. Recognising this demographic emphasis is important as it may impact the interpretation of results, given the potential influence of generational factors on trust and engagement with sharing economy platforms. Participants aged 35-44 constitute 14.8%, while those in the 45-54 age group account for 7.7%. Additionally, respondents aged 55-64 comprise 1.9% of the sample. Notably, neither participants younger than 18 nor older than 65 participated in the survey. Regarding employment status, a significant portion, 60.8%, reported being employed full-time, while 8.1% were employed part-time, suggesting that the employed population is well-represented in the sample. Approximately 30.1% of the participants were students, indicating a significant proportion of individuals within an educational setting.

Regarding sharing economy service utilisation, 19.6% of respondents expressed never having used these services, which suggests a notable portion of the sample has not yet ventured into the sharing economy landscape, indicating potential untapped markets or areas for awareness and adoption. A substantial group, 27.8%, reported rare usage, while the predominant segment, constituting 33% of respondents, engages with these services on a monthly basis. This could indicate a moderate level of acceptance and integration into monthly routines, reflecting a more consistent engagement compared to occasional or rare usage. Those participating on a weekly basis make up 13.9%, and the smallest proportion, a mere 5.7%, uses these services daily. This indicates that the sharing economy in Serbia is not fully matured, leaving room for development, as a limited number of individuals are integrating it into their daily routines.

4.2 Results Analysis

The Mann-Whitney test was employed to investigate whether there are gender differences in the level of trust in reviews within sharing economy platforms. The results ($Z: -4.066, p < 0.001$) revealed a statistically significant difference between men and women concerning their trust in reviews. Observing the mean ranks, 116.60 for women and 80.43 for men, suggests that women tend to place greater trust in the reviews they encounter on sharing economy platforms. Further insights from the Mann-Whitney test's frequency table illustrate that among women, the predominant trust level is 6, with 25 individuals, followed by 22 women with a trust level of 7. Notably, a substantial majority of women, totalling 98 or 69%, exhibit a trust level of 5 or higher in reviews on sharing economy platforms. Conversely, the analysis of men indicates that the highest number, 12 individuals, holds a confidence level of 3, followed by 11 men with a confidence level of 5. Notably, 45 out of 67 men, equivalent to 67%, exhibit a confidence level of 5 or lower in reviews on sharing economy platforms. In summary, the Mann-Whitney test outcomes underscore a significant gender-based disparity in trust towards reviews, with women showcasing a stronger inclination to trust compared to their male

counterparts. It is essential to note that the sample may not be gender-balanced, potentially impacting interpretations of gender-related findings. Therefore, caution is advised when considering the observed differences in trust levels between men and women.

To assess the impact of age on trust in reviews within sharing economy platforms, the Kruskal-Wallis test (Chi-Square: 88.527, $p < 0.001$) was applied. The results revealed a statistically significant difference across the observed age groups. Notably, the group of 18-24 years of age exhibited the highest mean rank at 143.93, suggesting that younger generations manifest the greatest inclination to trust online reviews on sharing economy platforms. Subsequently, the 25-34 age group displayed a mean rank of 100.11, positioning them as the next highest in terms of trust level. A subsequent Mann-Whitney test ($Z: -5.331$, $p < 0.001$), comparing these two groups, underscored a statistically significant difference between them. In contrast, the 35-44 years old group exhibited a considerably lower mean rank of 52.73, indicating a notable decrease in trust within this cohort. The subsequent age groups, namely 45-54 years old with a mean rank of 32.82, and 55-64 years old with a mean rank of 39.13, demonstrated the lowest levels of trust. The independent Mann-Whitney test ($Z: -0.246$, $p > 0.8$) between these two older groups found no statistically significant difference. In summary, the Kruskal-Wallis test outcomes highlight a substantial age-related variation in trust towards reviews, with younger individuals expressing higher levels of trust compared to their older counterparts.

The Kruskal-Wallis test was also used to assess trust in reviews on sharing economy platforms among distinct respondent groups in terms of employment, specifically full-time employees, part-time employees, and students. The test outcomes (Chi-Square: 18.046, $p < 0.001$) indicated a statistically significant difference among these groups. Notably, students exhibited the highest mean rank at 130.4, signifying the highest degree of trust in reviews, followed by full-time employees with 93.08 and part-time employees with 87.59. Subsequent independent Mann-Whitney test ($Z: -0.187$, $p > 0.05$) revealed no statistically significant difference between part-time and full-time employees. Once again, the findings reinforce a pattern observed in the previously explained age-related results, where students, aligning with the younger generation, demonstrated the highest inclination to trust reviews on sharing economy platforms. This suggests a consistent trend across demographic factors, emphasising the influence of age and employment level on trust dynamics within the context of online reviews.

Examining the influence of sharing economy service usage frequency on trust in reviews on sharing economy platforms was conducted using the Kruskal-Wallis test (Chi-Square: 112.284, $p < 0.001$). The test revealed a statistically significant difference among these groups. Significantly, respondents who have never used sharing economy services displayed a markedly lower degree of trust in reviews on sharing economy platforms, as indicated by a mean rank of 34.27. Trust shows a slight increase among those who rarely use these services, with a mean rank of 84.84. Notably, individuals who utilise these services on a monthly basis demonstrated a significant boost in trust, with a mean rank of 130.85. Those engaging on a weekly basis exhibited a mean rank of 155.84, while the daily users attained the highest mean rank at 172.58, signifying a heightened level of trust within these groups. Moreover, independent Mann-Whitney tests were conducted, comparing the monthly and weekly usage groups ($Z: -3.031$, $p < 0.003$), as well as the weekly and daily usage groups ($Z: -1.815$, $p > 0.05$). The findings revealed a statistically significant difference between users who engaged with sharing economy services on a monthly and weekly basis, while no such difference was observed between those who used services on a weekly and daily basis. This suggests that frequent users, particularly on a weekly or daily basis, have already established a substantial level of trust, leading to a lack of statistical distinction between these high-frequency usage patterns. In summary, the results underscore a positive correlation between increased frequency of sharing economy service usage and heightened trust in reviews, with a plateau observed when services are utilised weekly or daily. Remarkably, non-usage of these services is associated with a notably low level of trust in online reviews.

5 Discussion and conclusions

The primary aim of this study was to investigate how socio-demographic factors and the frequency of sharing economy service usage influence trust in reviews on sharing economy platforms. Valuable findings emerged from the conducted empirical study in the Republic of Serbia. Notably, women

exhibited higher trust in reviews on these platforms than men. However, it is important to exercise caution in interpreting this observation due to potential biases stemming from the non-gender-balanced sample used in this study. Additionally, a generational trend revealed that younger age groups tend to have higher trust, with a decline as the age limit increases. In accordance with years, students demonstrated the highest trust in online reviews of sharing economy services. Furthermore, an intriguing correlation was observed between the frequency of sharing economy service usage and trust in online reviews. Those who had never used these services displayed a notably low level of trust, emphasising the pivotal role of initial engagement in building trust. As users increased their frequency of service usage, trust in online reviews also increased. Remarkably, when users reached a weekly or daily usage level, their trust level was high. These findings highlight the intricate relationship between user socio-demographic factors, frequency of service usage, and the establishment of trust in the sharing economy landscape. Interestingly, these findings resonate with prior research on carpooling, suggesting that individuals with prior experience in sharing economy services are more inclined to trust platform-generated information.

The findings underscore the importance of tailoring approaches to cultivate trust among diverse demographic groups, particularly emphasising consideration for the elderly population, men, and individuals yet to engage with sharing economy services. Adapting strategies based on these insights not only holds the potential to enhance trust but also paves the way for increased adoption of sharing economy practices in Serbia. By implementing targeted actions, including awareness campaigns, educational initiatives, and a focus on user privacy and security, the level of trust in sharing platforms can be increased. This multifaceted strategy aims to build trust across all segments, ultimately fostering sustained growth in the sharing economy trend within the country.

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Crowdfunding and Entrepreneurial Drive: A New Paradigm in the Sharing Economy

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Abstract. *The popularization of the sharing economy has prompted transformative shifts in all economic activity, particularly in innovative financing options like crowdfunding. This study examines college students' perspectives on entrepreneurship and the role of crowdfunding as a tool for securing funds for their ventures. This research applies the Theory of Planned Behavior to explore the impact of students' attitudes, perceived control and social norms on entrepreneurship. It also examines the impact of formal entrepreneurial and financial education on entrepreneurial intentions and crowdfunding success. Structural Equation Modeling (SEM) was utilized to assess the hypotheses based on data collected from a survey conducted across multiple countries in the Balkans. The outcomes indicated that social norms have minimal impact on entrepreneurial intentions. Nonetheless, all other hypotheses showed significance. The findings also highlight the need to develop entrepreneurial skills and knowledge of financing options, suggesting the inclusion of crowdfunding in education to boost financial literacy and prepare students for modern entrepreneurship.*

Keywords. *entrepreneurship, crowdfunding, sharing economy*

1 Introduction

In recent years, the advent of the sharing economy has brought different transformative changes in various areas of economic activity, and when it comes to innovative financing options, particularly in the realm of entrepreneurship. One of the symptomatic novelties is systematic utilization of underexploited resources through digital platforms for mutual benefit, such as crowdfunding platforms (Richter et al., 2017). Those platforms have enabled access to capital from a diverse pool of investors without the constraints imposed by traditional financial institutions. This has especially been beneficial for small and medium enterprises (SMEs) (De Crescenzo, 2016), which often encounter challenges in securing conventional funding due to perceived risk and lack of collateral.

In the given context, the authors of this paper seek to explore if college students see the possible potential of crowdfunding as a propiate catalyst for entrepreneurial ventures within the sharing economy. By examining the interplay between entrepreneurial aspirations, crowdfunding mechanisms, and the broader socio-economic landscape, this study aims to unravel the underlying mechanisms driving entrepreneurial behavior among the researched population. By examining theoretical perspectives in current literature and conducting empirical research, this work aims to enhance the comprehension of the changing dynamics within modern entrepreneurship.

In essence, this paper represents a structured effort to comprehend the entrepreneurial ambitions of students and the determinants influencing their choices. Furthermore, it delved into students' acquaintance with crowdfunding and its correlation with their entrepreneurial aspirations and investigated the significance of formal education in shaping entrepreneurial intentions. Drawing upon insights from theoretical frameworks such as the Theory of Planned Behavior (TPB) and empirical evidence from a multi-country, regional survey, this paper seeks to clarify the factors shaping entrepreneurial intentions and the usage of crowdfunding for financing decisions.

2 Literature review

2.1 The theory of planned behavior, entrepreneurship and education

The Theory of Planned Behavior (TPB) is a key social psychology theory used to predict intentions, especially entrepreneurial ones (Baber, 2022). It indicates that factors such as attitude, social norms, and perceived behavioral control play a significant role in influencing the decision to become an entrepreneur (Yulandreano & Rita, 2023). Entrepreneurship requires initial considerations. Numerous researches have validated the effectiveness of (TPB) in forecasting entrepreneurial intentions (Baber, 2022; Munir et al., 2019). This forms the basis for the hypotheses of this study:

H1: Attitude towards entrepreneurship has a positive effect on entrepreneurial intentions.

H2: Social norms have a positive effect on entrepreneurial intentions.

H3: Perceived behavioral control has a positive effect on entrepreneurial intentions.

Entrepreneurial education, encompassing all educational and training activities, aims to foster entrepreneurial intentions and related factors such as knowledge, desirability, and feasibility. Since its inception at Harvard Business School in 1945, it has rapidly proliferated and garnered significant scholarly attention. While (Li & Wu, 2019) research highlights a positive relationship between entrepreneurial education and both entrepreneurial attitudes and skills, (Mahendra et al., 2017) suggest otherwise. This divergence in findings highlights the need for further exploration in this area. This suggests the hypothesis:

H4: Entrepreneurial education has a positive effect on entrepreneurial intentions.

2.2. Crowdfunding in sharing economy

Globalization and the advancement of information technologies which has revolutionized numerous industries (Stanimirovic et al., 2023), have spurred the growth of the sharing economy (SE) which can be characterized as a digitally enabled economic model that promotes the systematic sharing of underutilized resources for mutual benefits (Richter et al., 2017). SE is seen as a catalyst for national economic growth (Cherry & Pidgeon, 2018), and it is projected to exceed \$110 billion, offering significant opportunities for entrepreneurs (Richter et al., 2017).

Crowdfunding, part of SE, involves raising funds for projects and companies, from a crowd, via online platforms, while investors are rewarded with benefits or shares (Richter et al., 2017). Small and medium-sized enterprises (SMEs) frequently encounter difficulties in obtaining the essential funding for their business growth (Shams et al., 2018). They are typically seen as high-risk and non-bankable. Crowdfunding has emerged as an alternative funding source, offering a broader and more flexible reach without the need for collateral (Yulandreano & Rita, 2023). It has become a popular fundraising strategy for entrepreneurs globally since 2012 (Rahman et al., 2020) with over 40% of funding volume in the past five years raised by entrepreneurs (Petkova, 2022; Rahman et al., 2020). Additionally, Crowdfunding is prevalent among people aged 35-44 and students, emphasizing the need for student-focused research (Warwas et al., 2022).

H5: Entrepreneurial intentions has a positive effect on financing through crowdfunding.

2.3 Financial education

Formal financial education is vital for early exposure to financial concepts, providing access to underexposed groups, and reducing literacy acquisition costs (Lusardi, 2019). A recent report reveals that 48% of students express a desire to learn personal finance in school, yet most feel they are not gaining adequate financial management skills (GoStudent, 2023).

Universities often use crowdfunding in teaching, but its inclusion in specific courses is debated (Wenzlaff & Spaeth, 2023). While crowdfunding awareness varies among researchers, those familiar with it have found a positive link with entrepreneurial intentions (O'Donnell, 2023). Innovation teaching has evolved beyond just patenting ideas. It now includes open innovation methods, with crowdfunding being a significant part of the growing trend of open innovation practices (Wenzlaff & Spaeth, 2023). This all contributes to the formation of a hypothesis:

H6: Financial education has a positive effect on financing through crowdfunding.

Figure 1 presents the proposed conceptual model, which incorporates all the previously mentioned elements, their interconnections, and hypotheses.

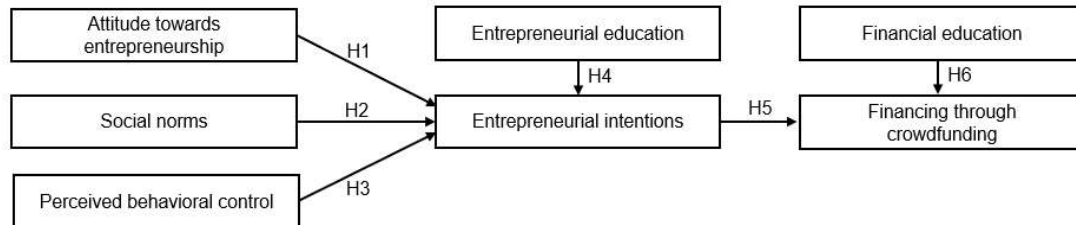


Figure 1. Proposed conceptual model (Source: Authors' work)

3 Conducted research

Data was collected in February 2024 via an anonymous survey completed by college students of all levels from Serbia, Montenegro, Bosnia and Herzegovina, and Croatia. The survey consisted of eight sections, including demographics and a section for each proposed model construct. Responses were collected through Google Forms and rated on a Likert scale that ranges from one, indicating strong disagreement, to five, indicating strong agreement. The data was subsequently analyzed using IBM SPSS 23 and IBM AMOS 26 for SEM model validation.

3.1 Results

A total of 230 responses were collected, with 87 male (36.1%) and 147 female respondents (63.9%). The majority of survey participants were first-year students at 39.1%, with third-year and second-year students next at 19.1% and 14.3%, respectively. Additionally, there were 23 fourth-year students (10%) and 23 master's students, 14 graduates (6.1%) who did not continue their studies, and 3 doctoral students (1.3%). The majority of survey participants are from the Republic of Serbia, with Montenegro, Bosnia and Herzegovina, and Croatia also contributing a significant number of respondents. Most students had an average grade between 8.00 and 8.99 (43%), followed by those with an average grade of 7.00-7.99 (33.9%), while the fewest students had an average grade between 6.00 and 6.99.

Upon examining the descriptive statistics, it is noticeable that students gave the highest rating (mean=4.249) to entrepreneurial education, indicating a desire for education and emphasizing the importance of entrepreneurial education as a mandatory subject. In addition, they particularly highlighted social norms (mean=4.226), emphasizing family and friends' support, while they gave a somewhat lower rating to the statement that entrepreneurship is a highly positioned profession in society. Regarding other constructs, the ratings are more reserved, ranging from a mean=3.282 for financing through crowdfunding to a mean=3.590 for entrepreneurial intentions. Of all the statements, students rated "I would like to educate myself about entrepreneurship" (4.496) the highest, while the lowest-rated statement was "Formal education provides me with all the necessary knowledge about investment opportunities and fundraising" (2.600). Also, as many as 158 students reported having a low level of familiarity with the concept of crowdfunding, while 85 had never even heard of it, so it is not surprising that only 41.7% of respondents support the concept of a sharing economy (rated 4 or 5).

Before the SEM analysis is carried out, it's essential to examine the reliability of the scales proposed. Cronbach's alpha, a measure of internal consistency, was used for this purpose. It ranges from 0 (complete inconsistency) to 1 (perfect consistency). A value of 0.70 or higher is considered desirable (Taber, 2018). The values for these indicators are as follows: Attitude towards entrepreneurship stands at 0.868, social norms at 0.717, perceived behavioral control at 0.828, entrepreneurial education at 0.786, entrepreneurial intentions at 0.932, financial education at 0.781, and financing through crowdfunding at 0.789. Therefore, it can be concluded that the condition has been met in all cases.

The SEM analysis was applied next. The initial model incorporated an additional construct - Promotion, and the hypothesis that promotion positively affects financing through crowdfunding was also analyzed. Model was not acceptable, with a Chi-square value of 1226.870, 397 degrees of freedom ($p=0.000$),

and a χ^2/df ratio of 3.090, which is above the acceptable threshold of 2 (Hu & Bentler, 1999). The RMSEA value was 0.096, which is less than the upper limit of 0.10 but not ideal according to stricter literature (Hu & Bentler, 1999).

The initial model was improved by removing the Promotion construct and making changes suggested by modification indices, which resulted in a final model with enhanced fit. The Chi-square value reduced to 724.242 with 368 degrees of freedom ($p=0.000$), and the χ^2/df ratio improved to 1.968, which is below the threshold of 2, indicating a good fit. The RMSEA value improved to 0.065. Other indices such as TLI (0.900) and CFI (0.916) were above the recommended 0.90 thresholds, indicating an acceptable fit for the modified model (Govindaraju et al., 2020).

Given the outcomes, it is concluded that the model's fit was enhanced, and the adjusted measurement model demonstrated an acceptable fit. Consequently, the results of the Structural Equation Modeling (SEM) are displayed in Table 1.

Table 1. Summary of Results for the Final Model (Source: Authors' work)

Construct	Predictor(s)	Std path	UnStd path	C.R.	p value	R ²
Entrepreneurial intentions	Attitude towards entrepreneurship	0.716	0.583	12.022	**	0.736
	Social norms	-0.090	-0.137	-1.798	0.072	
	Perceived behavioral control	.0446	0.397	7.819	**	
	Entrepreneurial education	0.126	0.120	2.549	**	
Financing through crowdfunding	Entrepreneurial intentions	0.267	0.271	3.852	**	0.175
	Financial education	0.308	1.297	2.162	**	

The study tested five hypotheses. Table 1 shows that all paths in the model, except H2, were significant. Unstandardized estimates reveal that the impact of Attitude towards entrepreneurship on Entrepreneurial intentions was positive and significant ($b = 0.583$, $t = 12.022$, $p < 0.001$), supporting Hypothesis 1. The effect of Social norms on Entrepreneurial intentions was negative and not significant ($b = -0.137$, $t = -1.798$, $p = 0.072$), rejecting Hypothesis 2. Hypothesis 3 was accepted as the influence of Perceived behavioral control on Entrepreneurial intentions was positive and significant ($b = 0.397$, $t = 7.819$, $p < 0.001$). The results indicated that Entrepreneurial education positively impacted Entrepreneurial intentions, accepting Hypothesis 4 ($b = 0.120$, $t = 2.549$, $p < 0.05$). Hypothesis 5 was accepted as the impact of Entrepreneurial intentions on Financing through crowdfunding was positive and significant ($b = 0.271$, $t = 3.852$, $p < 0.001$). Hypothesis 6 was also accepted as the impact of Financial education on Financing through crowdfunding was positive and significant ($b = 1.297$, $t = 2.162$, $p < 0.05$).

The squared multiple correlation coefficient (R²) for Entrepreneurial intentions was 0.736, indicating that 73.6% of the variance of the Entrepreneurial intentions construct was explained by Attitude towards entrepreneurship, Social norms, Entrepreneurial education and Perceived behavioral control. However, Entrepreneurial intentions and Financial education explained only 17.5% of the Financing through crowdfunding construct.

3.2 Discussion and limitations

Research aims to comprehend students' entrepreneurial aspirations and the underlying factors that influence their decision-making. We have adapted the Theory of Planned Behavior (TPB) and conducted an analysis of its impact on entrepreneurial intentions. Furthermore, we explored the relationship between formal education, entrepreneurship, and crowdfunding. Lastly, we investigated students' familiarity with crowdfunding and its relevance to their utilization of this funding method. The findings highlight the importance of fostering entrepreneurial skills and awareness of financing options.

The study affirms TPB's relevance in entrepreneurship, highlighting the significance of attitudes and perceived control on entrepreneurial intentions, in line with previous studies (Yulandreano & Rita, 2023;

Baber, 2022; Munir et al., 2019), but contradicts the notion that social norms significantly influence these intentions (Baber, 2022). The findings suggest that a strong inclination towards entrepreneurship, coupled with the belief in its financial benefits, serves as a powerful motivator for students to embark on entrepreneurial ventures. This motivation not only leads to the establishment of businesses but also contributes to the broader economic development of nations, underscoring the critical nature of this research area. Moreover, the research highlights the importance of realistic process understanding and control over entrepreneurial activities. Although students acknowledged their current limitations in theoretical knowledge and practical experience, their strong interest in learning and the high value placed on entrepreneurial education—advocating for it to be a mandatory part of the curriculum—indicate a mature recognition of the responsibilities entailed in entrepreneurship. This perspective reflects a balanced view among students, who are eager to learn yet aware of the challenges ahead. The positive correlation between entrepreneurial education and intentions, as demonstrated by this study and corroborated by existing literature (Li & Wu, 2019), underscores the significance of integrating entrepreneurship into educational programs.

The study identifies a significant gap in financial education regionally, with students showing insufficient knowledge in basic finance and emerging areas like crowdfunding. It advocates for the inclusion of crowdfunding in educational syllabuses to not only enhance financial literacy and modernize learning, but to prepare students for the future, particularly in understanding the sharing economy's impact on economic growth. This recommendation aligns with prior research (Wenzlaff & Spaeth, 2023), pointing to a broader need for comprehensive financial education that embraces current trends such as sharing economy. Limitations exist in generalizing the findings of the research beyond the specific context or population studied. Additionally, self-reporting bias should be considered, as participants may have inaccurately assessed their own attitudes and behaviors. This study's reliance on data sourced exclusively from a single questionnaire introduces the potential for common method bias, a limitation acknowledged and to be addressed in future research through collecting data from diversified sources. Furthermore, the dynamics of crowdfunding as a financing method will be explored through additional variables in future research.

4 Conclusions

This paper explored liaisons among entrepreneurial aspirations, crowdfunding, and the sharing economy. The research indicates that the development of entrepreneurship significantly depends on students' attitudes and aspirations towards it, with formal education acting as a critical base for achievement. Students' current familiarity with crowdfunding and the sharing economy is not at an optimal level, which can be addressed by integrating these concepts into formal education, since students consider it a trusted resource. In order to achieve economic development through entrepreneurship it is essential to invest in education and actively support both existing and aspiring entrepreneurs by educating them on innovative financing techniques and ensuring their accessibility.

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Navigating the Gig Economy Landscape: Assessing Methodological Challenges through the Lens of Gigmetar™

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Abstract. *This paper addresses the challenges associated with measuring the gig economy, recognizing the methodological hurdles in assessing platform work, and exploring potential solutions. Drawing on comparisons between various approaches to gauging the scale of online labour using substantial amounts of data, the paper examines the strengths and weaknesses of Gigmetar™, as a novel method already employed in evaluating the gig workforce in Serbia and Southeast Europe. In contrast to previous studies with limited sample sizes, Gigmetar™ employs extensive data analysis, capturing around 80% of the online workforce on the selected platform. This approach allows for a more comprehensive analysis of workers' characteristics and trends. The tool provides insights into gender distribution, income, and occupational profiles, facilitating biannual assessments. Furthermore, Gigmetar™ tracks the trends of gig workers and emphasizes the importance of accurate measurements for policymaking. While Gigmetar™ emerges as a promising method, ongoing challenges persist in adapting it to diverse platforms, keeping pace with the technology they employ, and extending its applicability to countries beyond the currently analyzed scope.*

Keywords. *Gigmetar™, online platform work, gig workers*

1 Introduction

The global prevalence of gig workers is on a steady rise, as evidenced by the latest World Bank report (2023), which identifies a staggering 545 online platforms operating worldwide. These platforms engage workers and clients in 186 different countries, underscoring the extensive reach of the gig economy (World Bank, 2023). Notably, country-specific data illuminates the increasing local economic significance of platform-mediated work (Stephany et al., 2021). Of particular interest is the revelation that low- and middle-income countries collectively contribute 40 percent of the overall gig platform traffic (World Bank, 2023). This statistic emphasizes the imperative to comprehensively assess the gig workforce in these countries. A case in point is Serbia, which, according to the 2015 World Bank report (Kuek et al., 2015) has consistently ranked among the global leaders in the number of online gig workers for the past decade. This assertion is corroborated by additional sources (Payoneer, The Online Labour Index, 2020), affirming the sustained prominence of Serbia in the online gig economy. The convergence of evidence from various reputable sources lends credence to the enduring and substantial presence of gig workers in Serbia over the years. However, efforts to estimate the gig economy's size face hurdles due to the lack of a universally accepted definition and methodological challenges (Kuhn & Galloway, 2019). Literature typically distinguishes between two main types of digital labour platforms: 'online web-based' platforms, which offer services like writing and programming, and 'location-based platforms,' such as delivery and ride-hailing apps that involve tasks at specific physical locations. The evolving landscape

of labour markets calls for more effective approaches to measure platform work within the overarching framework designed for precarious and casual employment. The primary differentiator in this context is the technological intermediation involved. Mehta (2020) emphasizes the importance of prioritizing data collection on gig workers for labour market statistics. This, as Mehta contends, is crucial for making informed policy decisions in the future. Such decisions are instrumental in establishing conducive working conditions for gig workers, ultimately fostering a scenario of decent work (Mehta, 2020, p. 10). Furthermore, state-level data has acquired critical importance, particularly as individual countries contend with legislating the gig economy and digital workforce (Schultz, 2020). A comprehensive understanding of these dynamics is imperative for policymakers, encompassing considerations for both the well-being of workers and effective tax administration (Garin et al., 2023). Several researchers have significantly contributed to investigating the size of the gig workforce in Serbia (Kuek et al., 2015; The Online Labour Index, 2020; Anđelković et al., 2020; Colovic et al., 2021). In the absence of state statistics, this data has illuminated policy approaches, leading to the Serbian government's decision in 2023 to provide improved tax solutions for online gig workers compared to their previous conditions. However, subsequent endeavors to devise appropriate frameworks for regulating the labour status of digital workers in Serbia have encountered obstacles, partly attributable to persistent methodological challenges in assessing the scope and nature of digital work. Consequently, platform (digital) workers remain inconspicuous to policymakers, leaving them in a precarious position concerning their labour and social rights.

2 An overview of previous attempts to measure the size of the gig economy

In the absence of official statistics, many researchers relied on non-official surveys (Ludec et al., 2019; Piasna & Drahokoupil, 2019) and experimental studies (Pesole et al., 2018; Urzi Brancati et al., 2020; Brawley Newlin, 2023) to estimate the size of online gig work. Many independent and ad hoc surveys offer an extensive array of questions, indicating some level of reliability, which can be repurposed and further validated by other researchers in different countries (Pesole et al., 2018). However, the success and accuracy of such approaches usually depend on three critical steps: defining concepts, formulating questions, and selecting respondents (Piasna, 2020). Additional attempts focused on administrative data to assess the number of gig workers, as administrative data can overcome the problem of small sample size, reduce the burden on data providers, and reduce the cost of data collection. For instance, some estimates of the scope of the gig economy in the USA are based on tax data (Collins et al., 2019; Garin et al., 2022). Van Slageren et al. (2023) use data on transactions conducted by 5,535 gig providers to identify the level of the gig economy in 26 different European countries. However, even these methods often include limited administrative data that fail to capture the relevant gig population. For example, Gussek & Wiesche (2023) and Gussek et al. (2023) focused only on IT freelancers, without considering other professions present in the gig market. Also, administrative data were not collected for statistical purposes and may have problems with timeliness, relevance, and accuracy (O'Farrell & Montagnier, 2019). Understanding trends in the gig economy poses a challenge as household surveys and administrative data present divergent pictures. The former usually reveals limited evidence of the growth in self-employment associated with a surge in gig activity, while the latter tends to indicate substantial growth trends (Abraham et al., 2018). National statistical offices have been hesitant to include direct questions on platform work in traditional labour force surveys, citing a small target population, an anticipated low response rate, and a lack of agreed-upon definitions and operationalization of platform work. Another challenge faced by labour force surveys is the assignment of employed persons to sectoral and occupational classes without clear guidelines on where to position platform work. This hinders the full integration of platform work into existing statistical frameworks. Besides surveys and administrative data collection, recent approaches also rely on collecting available digital footprints on online platforms. One of the most renowned indicators of this kind is the Online Labour Index 2020 (OLI 2020), an indicator of both the demand and supply of online digital labour (Kässi & Lehtonvirta, 2018). Initially represented as an iLabour Project of the Oxford Internet Institute and later established as a collaboration between the International Labour Organisation and the Oxford Internet Institute, it is one of the very few tracks online digital labour market, on an international level. It measures the scope of the global online digital labour market by tracking the number of projects and tasks posted on the five largest English-language online labour platforms, and since 2020, six non-English language platforms;

three in Spanish and three in Russian. Comprehensive data allows OLI 2020 to estimate both the demand and supply of online digital labour across countries, occupations, and gender.

3 Gigmetar™, an avenue for evaluating the gig economy

Serbian online gig workers have become a dynamic and increasingly influential force in the global freelance community. They are consistently recognized for their diverse skill sets, unwavering dedication, and competitively priced services. Offering a wide array of services spanning web development, graphic design, content creation, digital marketing, software development, and various other specialized domains, these individuals contribute significantly to the global freelance landscape. On the other hand, they have become a strong force in the domestic market, worthy of attention and analysis. In that regard, Gigmetar™ (Anđelković et al., 2020) appeared as a novel framework in 2019, aimed to inform both experts and the general public about the trends and characteristics and offer a more detailed analysis of the Serbian online workforce. It is an instrument specifically designed to monitor various dimensions of online platform workers, including their number, gender distribution, incomes, and occupational profiles. It systematically assesses the online gig population on Upwork, one of the most popular global digital platforms¹ in Serbia and its neighboring countries, namely Romania, Hungary, Croatia, Bosnia and Herzegovina, Montenegro, Albania, North Macedonia, and Bulgaria, collectively constituting the Southeast European region. In contrast to previous quantitative studies and surveys focusing on online labour markets, often constrained by limited sample sizes (Anđelković, et al., 2019), Gigmetar™ distinguishes itself through extensive data analysis. It encompasses approximately 80% of the total population of active online workers on the observed platform. The data is meticulously collected through web scraping of publicly accessible information from worker profiles on the platform. This instrument collects and processes various data about online workers such as gender, location (city, region), skills, primary occupation, additional occupations, hourly wage (wage demanded by the worker), total income, number of finished jobs, number of ongoing jobs, etc. Importantly, Gigmetar™ conducts biannual assessments to analyze the number and characteristics of workers. Following the latest established methodology², a total of six measurements have been carried out—two in each of the years 2021, 2022, and 2023. The created instrument enables diverse analyses, providing insights into various dimensions within the digital work domain. It allows the breakdown of digital labour by gender, the exploration of demanded hourly rates, and the allocation of workers among specific professions. Classification of gig workers into professions consists of six primary occupational groups as defined by OLI methodology (Kässi & Lehdonvirta, 2018). Those occupational groups are defined as follows: 1) professional services, 2) clerical and data entry, 3) creative and multimedia, 4) sales and marketing, 5) software and technology development, and 6) writing and translation. Occupation classification is based on self-reported skills provided by digital platform workers registered at the Upwork platform (Ivanovic et al., 2023) and collected by Gigmetar™. Additionally, (sub)methodologies have been developed within this instrument which provide insights into the structure by gender and profession, wage rates by gender and profession, and income levels earned by gender. Gigmetar™ proves versatile not only in offering a snapshot analysis of the national online labour market at a specific moment but also in facilitating cross-country comparisons of digital labour forces based on multiple characteristics. Additionally, it serves as an effective tool for monitoring the evolutionary trajectory of the digital labour market within a single country over time, as measurements and analyses are conducted periodically. This methodology enables a comprehensive and representative exploration of the digital workforce in the specified geographical scope. For example, in the case of Serbia, Gigmetar™ analyses the dimensions of the gig workforce in sub-national regions according to the Nomenclature of Territorial Units for Statistics (NUTS 2 level) classification. The analysis of gig workers at the sub-national level can be conducted in any other countries that apply the NUTS classification.

¹ The number of gig workers in Serbia and SEE region is also assessed on two more platforms – Freelancer and Guru but detailed analysis of gig population in these countries is based on data derived from Upwork.

² Prior to this, the data collection methodology underwent several modifications until the final data collection methodology was established using web scraping techniques.

4 Conclusion

To outline the advantages and disadvantages of the Gigmetar™, several conclusions should be drawn in line with comparison to the OLI 2020, as both collect and analyze a significant volume of data. First, Gigmetar™ derives data from the three most popular platforms in Serbia and the SEE region, namely Freelancer.com, Guru.com, and Upwork.com, with a special focus on the latter. OLI collects data from the five largest English-speaking platforms (three of those included in Gigmetar™ plus Amazon Mechanical Turk, and Peopleperhour.com) and was recently expanded to include a few Spanish- and Russian-language platforms. Second, OLI 2020 OLI collects data on a much larger sample of countries, measuring online work at scale. Gigmetar™ is still limited to the SEE region, as including only nine countries. It remains to be tested whether Gigmetar™ will maintain its robustness in assessing gig populations in other countries and platforms. Namely, it is important to note that this methodology has so far been successfully tested and applied only by exploiting the data from the Upwork platform. Although the focus on Upwork in Serbia and the SEE region is justified by its popularity and the substantial number of gig workers, this may not be the case in some other countries. Examining digital work in countries where Upwork is not the most dominant platform may provide incomplete insights, overlooking other platforms with a significant gig workforce. Third, OLI 2020 provides data across countries, occupations, and recently gender. On the other hand, Gigmetar™ can provide some additional insights. With considerable accuracy, it offers an overview of the gig work supply based on gender, occupations, requested wage rates, and total earnings. This instrument includes additional analyses of the market structure, including gender distribution across occupations, gender distribution based on wage rates and earnings, occupations based on wage rates and earnings, etc. In addition to national-level analysis, Gigmetar™ can analyze the regional structure of gig work within countries, including sub-national regions, districts, or cities. Undoubtedly, future research should focus on techniques that could be used to estimate the size of directly inaccessible populations or populations difficult to observe or monitor straightforwardly. A complete approach would require information from all platforms, considering an indicator of overlap, as workers are often registered on multiple platforms. However, the feasibility of this approach is questionable, as web scraping tools would need to be adapted to each platform's content and technical issues individually.

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A Trade-Off Between Negative Externalities and Performance in the Sharing Economy

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Abstract. *By enabling the transaction of private resources among strangers, the sharing economy has increased consumer welfare, but it has also created negative externalities for society. This study investigates the tradeoff between negative externalities and platform performance in the short-term rental market. The goal is to identify the economic incentives for sharing economy platforms to self-regulate. Using data from Airbnb and parking fines data, this study finds that heterogeneous complementors contribute differently to this tradeoff, providing an opportunity for platform governance.*

Keywords. *trade-off, externalities, sharing-economy*

1 Introduction

Sharing economy platforms have been able to decrease the transaction costs for exchanging resources among peers (Sundararajan, 2016) that were previously used only privately (Munger, 2018). These platforms have been able to reduce transaction costs by implementing a rating system that effectively creates trust in the digital market space (Hui, Saeedi, Shen, & Sundaresan, 2016) and by exploiting the increased efficiency of information communication technologies (Sundararajan, 2016). On the other hand, the fast growth and the unregulated entry of sharing economy platforms have created negative externalities for society. Negative externalities are additional costs that individuals not directly involved in the sharing economy have to pay as a consequence of transactions completed within any sharing economy platform by its users (Hippel & Krogh, 2016; Zervas, Proserpio, & Byers, 2017). Examples of negative externalities associated with Airbnb tenants include guests being lost and asking for directions, consuming rivalrous public resources (e.g., parking spaces), and failing to care for shared resources (Edelman & Geradin, 2015; Zervas et al., 2017). Similarly, Uber's entry has led to an increase in traffic congestion (Edelman & Geradin, 2015; Ricart, Snihur, Carrasco-farré, & Berrone, 2020). When not properly addressed by the platform, these problems have led to the banning of sharing economy firms, and they may eventually cause the failure of the sharing economy (Chasin, von Hoffen, Hoffmeister, & Becker, 2018) if it does not satisfactorily address these negative externalities.

Numerous studies are emerging to document the existence of heterogeneity among digital platform complementors who differently affect the platform performance (Binken & Stremersch, 2009; Gretz & Basuroy, 2013; Hogendorn & Yuen, 2009; Kim, Prince, & Qiu, 2014), who produce different types and levels of network externalities (Corts & Lederman, 2009; Landsman & Stremersch, 2011), and who react differently to the platform's governance tools (Koo & Eesley, 2020; Rietveld, Seamans, & Meggiorin, 2021). This study looks at competitive strategies of sharing economy complementors to investigate the extent to which heterogeneous complementors are equipped and motivated to address the negative externalities produced by the sharing economy platform Airbnb. In particular, this study asks: *Is there a tradeoff between positive and negative externalities affecting a sharing economy platform's performance? If so, to what extent do heterogeneous complementors contribute to this tradeoff?*

2 Theory

In this section, we will explore the theoretical framework that underlies the trade-off between negative externalities and platform performance in the sharing economy. We will examine the impact of complementors' portfolio size on transactions and negative externalities produced, and the potential curvilinear relationship between them. Understanding these relationships is crucial for identifying economic incentives for sharing economy platforms to self-regulate and for effective platform governance.

2.1 Portfolio size effect on transactions

Because of the nature of the products transacted in the sharing economy, where complementors and consumers share physical spaces (e.g., a car, a house) while being complete strangers, trust is a necessary condition for the transaction to take place, yet very hard to build (Fradkin, Grewal, & Holtz, 2021; Sundararajan, 2016; Uzunca, Rigtering, & Ozcan, 2018). Regardless of how the complementor is able to successfully signal its quality and trustworthiness to consumers, the more products the complementor provides on the platform, the more products will likely enjoy the higher likelihood of future transaction rates. The combination of trust-building tools on a platform and perception of quality spillovers across products managed by the same complementor then suggests that a complementor's portfolio size and the transactions fulfilled by each product in the portfolio may be curvilinear, not strictly monotonic. Specifically, this study argues that the more products a complementor manages on a digital platform, the higher the frequency of transactions per each of those products. However, in the exchange of experiential goods, there exists a natural limit to the number of transactions that can be fulfilled at any given time. For example, any Airbnb property can only be rented to one (party of) customer every day, as co-habitation by multiple customers is unacceptable on the platform. Even in Uber and Lyft, co-sharing of the same experience by multiple customers (i.e., carpooling) is limited by the number of seats available in a car. The self-reinforcing loop between products in the same portfolio predicts a curvilinear relationship of inverted U-shaped form between the number of products managed by a complementor and the number of transactions fulfilled by each product.

H1: The relationship between a complementor's portfolio size and the number of transactions fulfilled by each portfolio product is curvilinear (inverted U-shape).

2.2 Portfolio size effect on negative externalities produced

One dimension that differentiates complementors and is likely to lead to differences in the way they can control the quality of their transactions and, thus, the level of short-term negative externalities they produce is the complementor's portfolio size. The portfolio size reduces the span of attention that a complementor can dedicate to each of its products (Hsu, Hannan, & Kocak, 2009). Especially with service goods (like those in the sharing economy), it is difficult for a complementor to fully control and, hence, perfectly replicate a successful experience. The main challenge might derive from the unpredictability of human interactions, specifically how to react to new challenges or problems brought by the demand side positively and consistently. For example, heterogeneous Airbnb guests might bring up different problems and unexpected requests to the host. The complementor's ability to promptly act and solve any possible problem between, for example, the Airbnb guest and the neighbor depends on the complementor's number of similar situations that it must contemporaneously deal with. In other words, the more products a complementor provides in the sharing economy platform, the less attention it is able to allocate to any problem arising from any of these products, including problems creating negative externalities for society. Therefore, this study expects that the larger the size of a complementor's portfolio, the more short-term negative externalities it will produce.

H2: The larger a complementor's portfolio size, the higher the level of negative externalities produced (linear relationship).

3 Methods

This study uses AirDNA data about Airbnb activity in Los Angeles to test both hypotheses. Daily data was collected about all Airbnb providers active in the city of Los Angeles between November 2014 and February 2020. These data include the geolocation of each listing and performance measures like reservations and price. In addition to the Airbnb data, the study used public data about parking fines in the city of Los Angeles, also recorded on a daily basis and with precise geolocation data associated with each fine. The daily and geolocation features of both data sources enable the merge of the two datasets, hence the testing of this study's hypotheses.

3.1 Dependent variables

The two dependent variables of this study are *Number of transactions* fulfilled and *Level of negative externalities* produced at the product level. Both variables are measured at the listing and month level.

In line with previous studies in the platform literature, *Number of transactions* is measured as the number of nights booked by consumers on the Airbnb platform, per each listing in every month of data collection (Hagiu, 2011; Rietveld, 2018). The variable ranges from 0 to 31, which is the maximum number of nights any listing can be booked in a month (of 31 days).

The *Level of negative externalities* is measured by counting the number of parking tickets assigned any given month within a few meters from the target listing. For the measurement of this variable, only parking tickets related to overnight infractions or infractions that can be linked to Airbnb guests' stay have been considered (i.e., blocking the driveway, overnight parking, private property, parked in parkway (including "pkd in/on parkway")) For any given day, if the target listing was booked, the number of parking tickets assigned within a 250 meters (820 feet) radius was recorded. If the listing wasn't booked for that day, then a value of zero would be assigned to the listing.¹ The number of fines per day was then aggregated at the monthly level by counting the number of parking fines matched to the listing during the entire month. The variable ranges from 0 to 372.

3.2 Independent variables

The main independent variable of both hypotheses is the portfolio size of each complementor. This measure is recorded at the listing and month level. It is a count of the number of listings managed (in Los Angeles) by an Airbnb host at any month in time. It is a time-variant variable.

3.3. Controls

All the models include controls for time-variant features of the listing. They control for the month's average nightly price to book the listing (i.e., price), the number of months the listing has been active on the platform (i.e., tenure), and the number of nights made available for booking by the host at the listing level (i.e., nights for booking). In order to account for unobservable features of the listing that might affect either of the two dependent variables of the study, the study adds listing fixed effects to the main model. Similarly, the models include time fixed effects at the month level to control for time variant effects that might affect the results. Finally, there may be features of the geographical area that predict the likelihood of a listing being booked (e.g., trustiness of the neighborhood) or of the car being fined (e.g., patrol intensity by the police in the area). The study uses zip code fixed effects to control for these unobservable.

¹ This study assumes that Airbnb guests are not the only people committing parking infractions. Thus, to reduce the noise on the coding of the variable, the parking ticket was assigned to the listing only if a guest was present to be the potential target of the ticket.

4 Results

The results section presents the main findings of the study on the tradeoff between negative externalities and platform performance in the sharing economy. The section is divided into two subsections, each focusing on one hypothesis of the study.

4.1 Effect on the number of transactions

Table 1 reports the main results of the analysis pertaining to the effect of the complementor's portfolio size on the number of transactions fulfilled by each product. Model 1 in Table 1 reports the results of a simple OLS regression, Model 2 adds fixed effects at the listing level, Model 3 includes only monthly fixed effects, Model 4 includes only zip code fixed effects, Model 5 includes both listing and month fixed effects, while Model 6 includes all fixed effects (i.e., listing, month, and zip code). The results remain consistent across the different specifications of the model. Specifically, we see that portfolio size has a positive and significant effect on the number of transactions ($\beta = 0.0462$, $p < 0.001$, in Model 6). Moreover, we observe the presence of a significant curvilinear effect in that the coefficient of portfolio size square is also significant and negative ($\beta = -0.0004$, $p < 0.001$, in Model 6). This indicates the presence of an inverted U-shaped relationship between portfolio size and the number of transactions.

Table 1. Main results for Number of transactions fulfilled at the listing level (Source: Author's work)

	Dependent variable: Number of transactions at the listing level					
	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Complementor's portfolio size	0.117*** (0.002)	0.052*** (0.004)	0.102*** (0.002)	0.127*** (0.002)	0.046*** (0.004)	0.046*** (0.004)
Complementor's portfolio size square	-0.001*** (0.000)	-0.001*** (0.000)	-0.001*** (0.000)	-0.001*** (0.000)	-0.000*** (0.000)	-0.000*** (0.000)
Price (USD)	-0.000*** (0.000)	-0.001*** (0.000)	-0.000*** (0.000)	-0.000*** (0.000)	-0.002*** (0.000)	-0.002*** (0.000)
Tenure (months)	0.023*** (0.001)	-0.087*** (0.001)	0.011*** (0.001)	0.019*** (0.001)		
No. of nights made available for booking	0.207*** (0.001)	0.344*** (0.001)	0.209*** (0.001)	0.214*** (0.001)	0.347*** (0.001)	0.347*** (0.001)
Listing FE	No	Yes	No	No	Yes	Yes
Month FE	No	No	Yes	No	Yes	Yes
Zip code FE	No	No	No	Yes	No	Yes
Constant	1.741*** (0.035)	0.171*** (0.035)	1.939*** (0.036)	1.573*** (0.035)	-1.099*** (0.035)	-1.098*** (0.035)
Observations	1,153,448	1,148,461	1,153,448	1,153,432	1,148,461	1,148,445
R-squared	0.032	0.587	0.047	0.050	0.599	0.599

Standard errors in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

Note: "Tenure (months)" omitted because of collinearity in Models 5 and 6

4.2 Effect on negative externalities level

Table 2 reports the main results of the analysis pertaining to the effect of the complementor's portfolio size on the level of negative externalities produced. Model 1 in Table 1 reports the results of a simple OLS regression, Model 2 adds fixed effects at the listing level, Model 3 includes only monthly fixed effects, Model 4 includes only zip code fixed effects, Model 5 includes both listing and month fixed effects, while Model 6 includes all fixed effects (i.e., listing, month and zip code). The results remain consistent across the different specifications of the model. Specifically, the complementor's portfolio size is always positive and significant ($\beta = 0.0035$, $p < 0.001$, in Model 6). These results support the second hypothesis of this study.



Table 2. Main results for the Level of negative externalities at the listing level (Source: Author's work)

	Dependent variable: Level of negative externalities					
	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Complementor's portfolio size	0.014*** (0.000)	0.001* (0.001)	0.010*** (0.000)	0.006*** (0.000)	0.004*** (0.001)	0.004*** (0.001)
Price (USD)	-0.000*** (0.000)	-0.000*** (0.000)	-0.000*** (0.000)	-0.000*** (0.000)	-0.000** (0.000)	-0.000** (0.000)
Tenure (months)	0.002*** (0.000)	0.014*** (0.000)	-0.006*** (0.000)	0.004*** (0.000)		
No. of nights made available for booking	0.002*** (0.000)	-0.000 (0.000)	0.001*** (0.000)	0.000 (0.000)	-0.000 (0.000)	-0.000 (0.000)
Listing FE	No	Yes	No	No	Yes	Yes
Month FE	No	No	Yes	No	Yes	Yes
Zip code FE	No	No	No	Yes	No	Yes
Constant	1.444***	1.429***	1.613***	1.518***	1.595***	1.595***
Observations	1,153,448	1,148,461	1,153,448	1,153,432	1,148,461	1,148,445
R-squared	0.003	0.442	0.037	0.105	0.464	0.464

Standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1

Note: "Tenure (months)" omitted because of collinearity in models 5 and 6.

5 Discussion and Conclusions

The paper delves into the dynamics of digital platform ecosystems, specifically exploring how various complementors contribute to both positive and negative externalities. It discovers that complementors with larger portfolios tend to increase transaction volumes yet concurrently elevate negative externalities. This finding enriches our comprehension of how different types of platform users impact the broader ecosystem (Binken & Stremersch, 2009; Koo & Eesley, 2020; Rietveld et al., 2021). Moreover, the study sheds light on the strategic potential for digital platforms to self-regulate, illustrating how they might navigate tradeoffs between positive and negative externalities throughout their life cycle (Cusumano, Gawer, & Yoffie, 2021; Parker, Petropoulos, & Van Alstyne, 2021; Tucker, 2019). By uncovering a nuanced relationship between complementor portfolio size and transaction fulfillment, the research suggests opportunities for value creation through ecosystem orchestration, thereby extending prior discussions on the influence of certification within platform settings (Hui et al., 2016; Rietveld et al., 2021).

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Institutional Work of Sharing Platforms and Incumbents in Brussels: Comparing the Ride-Hailing and Hospitality Industry

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Abstract. *The rise of sharing platforms has sparked research on how the new businesses have impacted established institutions. While research has extensively examined platforms' role as institutional entrepreneurs, more attention is needed on other actors, to gain a clear view of how sharing ecosystems operate. Our study addresses this gap by exploring and comparing institutional work of both sharing platforms and incumbents in the Brussels segments of ridehailing and hospitality lodging. Through case studies based on data from content analysis we explore the disparities in institutional tactics and their implications for governance from 2009 to 2022. Our findings reveal that each ecosystem has unique dynamics, with ridesharing facing more controversy and conflict than homesharing, where tensions are more subtle. The findings also shed light on how actors' institutional work has reshaped governance in both sharing segments.*

Keywords. *Institutional work, Uber, Ridehailing industry, Airbnb, Hospitality Industry, Brussels Capital Region*

1 Introduction

The advent of sharing platforms about 15 years ago has sparked scholarly and public debate on how they seek to transform established institutions (Acquier et al., 2020; Mair and Reischauer, 2017; Martin, 2016). Several studies have focused on the tactics that sharing platforms developed to shape the institutional agenda to their benefit. At the core of the studies is platforms' role as an institutional entrepreneur in businesses such as homesharing (Ferreri and Sanyal, 2018; Uzunca and Borlenghi, 2019), ride- and carsharing (Bond, 2015; Martini, 2017; Pelzer et al., 2019; Vaskelainen and Münzel, 2018), bike sharing (van Waes et al., 2020; Winslow and Mont, 2019) or a mix of sharing economy businesses (Li and Schoenherr, 2023; Tseng and Chan, 2019; Uzunca et al., 2018; Zvolška et al., 2019a, 2019b). A few studies have highlighted institutional responses of traditional incumbents against new sharing platforms (e.g., Weber et al., 2019; Distelmans & Scheerlinck, 2024), while other studies have analysed the impact of sharing platforms on the incumbent performances (e.g., Chang and Sokol, 2022; Nakamura et al., 2024). A key motivation that engages platforms for institutional work is to increase legitimacy, while incumbents rather seek to safeguard already attained legitimacy (Battilana and D'Aunno, 2009; Lawrence et al., 2013; Lawrence and Suddaby, 2006; Pacheco et al., 2010). Some studies have focused on multiple actors within sharing ecosystems (Boon et al., 2019; Lehmann et al., 2022), indicating a gap in understanding multi-actor perspectives. Now that the sharing economy has come of age, such a multi-actor perspective may help to understand the dynamics and strategic responses by the various actors across different sharing economy segments in terms of institutional work, and what that means for urban governance. Using Lawrence and Suddaby's (2006) framework of institutional tactics, which encompasses 18 distinct tactics, we explore how firms seek to create, maintain or disrupt institutional norms. This approach sheds light on both discursive and non-discursive aspects of actors' tactics and unveils their underlying motives and objectives. Aligned with our objective to understand the multi-actor dynamics, we aim to address the following research questions: (1) 'How does the meaning and purpose of institutional work differ between sharing economy platforms Uber and

Airbnb and their incumbent counterparts in Brussels ride-hailing and hospitality?'; and (2) 'What are the differences in tactics employed by platforms and incumbents in attaining or maintaining legitimacy?'. We develop case studies based on data from content analysis, to identify the meaning of institutional work, and the tactics revolving around that work. The longitudinal approach helps to understand how both ecosystems differ in terms of interactions between actors in the urban context of Brussels. The subject area is highly relevant due to the controversy of sharing economy that has revolved around sharing economy operators in Brussels. In addition, Brussels decision making closely interferes with national and EU governance, due to its central location in Europe and the particular political system of Belgium. This short conference paper focuses mainly on the results of the study. In the following section we briefly introduce the methodology. After that section, we present the case studies of ridehailing and hospitality lodging in Brussels, including a comparative analysis. The last section provides discussion and conclusion.

2 Methodology

We collected data through qualitative content analysis using press text data from prominent Belgian and Brussels local newspapers, and a leading business magazine. The use of press text provides valuable insights into the diversity of tactics being used. Previous studies on institutional work (e.g., Boon et al., 2019; Pelzer et al., 2019) have shown that actors within the sharing economy ecosystem frequently use media platforms to articulate institutional concerns and influence public opinion. We employed Boolean search operators for both ridehailing and hospitality lodging in Brussels. To analyse ridehailing, we used 'Uber AND Brussel' and 'Uber AND Bruxelles' respectively for Dutch and French language sources. We collected a dataset of 2,284 articles from January 1, 2014 (Uber's introduction in Brussels) to June 30, 2022. Filtering out irrelevant articles resulted in 642 useful articles specifically focused on ridehailing. To analyse the hospitality lodging segment, we employed search terms 'Airbnb AND Brussel' and 'Airbnb AND Bruxelles', resulting in 578 articles from January 1, 2009 (Airbnb's introduction in Brussels) to December 31, 2022. After excluding irrelevant articles beyond the study scope, 369 articles remained. A thorough reading and coding process of the useful texts has led us to identify 480 quotes for both the ridehailing and hospitality industry. First, we categorized the quotes into activities of institutional work, including both discursive and non-discursive content, conveyed by sharing platforms and incumbents to address institutional and governance-related matters. Second, we labelled the activities with tactics, as defined in theories of institutional work. Tactics that lacked theoretical backdrop were conceptualized in a more inductive way, which allowed for a more exploratory approach.

3 Results

This section presents the findings of our data analysis. We delve into the activities of institutional work of both platforms and incumbents. Finally, we compare ridehailing and hospitality lodging.

3.1 Uber's institutional work

We distinguish four categories of institutional work, looking at content addressed by Uber to attain specific institutional or governance outcome or to convey messages with an institutional agenda. First, Uber directed a majority of its institutional work to governments and regulatory entities. By requesting consultations and by lobbying the Brussels government, Uber sought to adapt regulations to its benefit. With the press as main stage for employing its discursive strategy, Uber highlighted the outdated character of existing regulations in Brussels ridehailing. Uber also lobbied at EU level, to convince EU commissioners of the benefits of Uber services for urban mobility and living. Second, through rhetoric aimed at enforcing innovation Uber emphasized the benefits of ridesharing and clarified its app-based concept. Claiming they are not a taxi company but an innovative technology company using a mobile application, Uber portrayed its business as main solution for traffic congestion and facilitator of sustainable cities. Rhetorical strategies were used to shape public opinion and image building. Third, Uber built alliances with several stakeholders, more specifically competitors (to have stronger negotiation power), airlines (to offer discounts on rides to the airport), and local taxi drivers (by proposing them to ride for Uber along with their classic job of taxi driver). Building alliances as a business strategy

has thus served to increase legitimacy and public recognition. Fourth, through discursive strategies of cognitive emotion, Uber put the Brussels government into a negative light, by stating that the city was not listening to the needs of the inhabitants. Such discourse was combined with claims that Brussels inhabitants were embracing their services and wanted Uber to stay in the city.

3.2 The taxi industry's institutional work

The taxi industry used to a large extent discourses of institutional work to raise concerns over regulation and legislation. Calling for fair competition, the taxi industry stressed that they had to play by the rules, while Uber failed to comply with regulations. Like its digital competitor, the taxi industry employed discourses, be it rather by threatening the Brussels government if regulatory demands would not be answered. Through cognitive emotion work, taxis expressed their satisfaction about Court rulings against Uber. Taxis also voiced negative sentiments against actors such as Brussels Airlines, who collaborated with Uber, or against the government's unclear stance on Uber's legal status. Institutional work by the taxi industry is also reflected in industry dynamics. The industry's prompt launch of booking apps, similar to Uber's technological apps illustrates how taxis have adapted to Uber's business model.

3.3 Airbnb's institutional work

We identify three main categories of institutional work employed by Airbnb in Brussels. The multifaceted character is shown in the combination of both discursive and non-discursive tactics, used to communicate and interact with the different stakeholders such as governments, public and industries. Airbnb's institutional work strongly focused on regulatory concerns, addressed to government and regulatory bodies. Engaging in institutional discourses, the platform highlighted the overly strict character of homesharing regulation, thus calling for more leniency. Airbnb employed a rather positive tone in acknowledging the EU member states' endorsement of a unified framework for sharing tax information among platforms. The findings show evidence of industry dynamics, as illustrated by Airbnb's adaption to the hotel industry. Illustrative is the platform's use of professional pictures to promote listings, and its opening up to other types of accommodations such as hotels in line with travel marketplaces like booking.com. Also, Airbnb Experiences illustrates how the platform adapts to the more traditional tour organizations, and underscores how Airbnb has changed its business models, as a strategic response to evolving market demands. Airbnb's institutional work also had an important rhetorical dimension, being designed to enforce platform innovation. Discursive communication focused on explaining the Airbnb concept, highlighting the benefits of homesharing, educating hosts, and stressing that Airbnb is not a competitor to the hotel industry. Furthermore, rhetoric was used to counter public criticism against its business.

3.4 The hotel industry's institutional work

Themes of institutional work by the incumbent hotel industry in Brussels largely revolved around concerns and challenges over regulation and legislation. Hotels pinpointed the need for fair competition, by suggesting a desire for a level playing field. A major concern among hotels, especially during Airbnb's introduction in Brussels, related to taxation and fire safety standards, being stricter for hotels than for homesharing. The hotel industry also called for more controls over Airbnb listings. Through work of cognitive emotion, the Brussels hotel industry expressed ideas for change to influence public opinion. The approach was two-fold. Hotels expressed negative sentiments toward Airbnb, by showing satisfaction with stricter rules for homesharing, established by the Brussels government. More positive sentiment was expressed when hotels accommodated to Airbnb's growing impact on tourism in Brussels. Industry dynamics in the hospitality industry included hotels' industry adaptation to Airbnb's innovation. Illustrative is how hotels have incorporated more local concepts in their services. Examples are the introduction of 'Brusselicious', a concept that offers Brussels products during breakfast or dinner and organises activities guided by locals from Brussels.

3.5 Comparative analysis of ridehailing and hospitality lodging in Brussels

The above analysis enables to compare both the ridehailing and hospitality industry in terms of institutional work, along with the nature of tactics and interactions. Ridehailing and hospitality have in

common that both platforms have strongly engaged in institutional work to reshape and even disrupt regulations. Both Uber and Airbnb engaged in lobbying and negotiations to point at the outdated character of regulations and to urge policy makers toward regulatory changes. Both platforms enforced innovation by highlighting the benefits of their business model and emphasizing their uniqueness. On incumbents side, both taxis and hotels showed a strong and proactive response against platforms' regulatory agenda. Incumbents also emphasized the importance of fair competition and level playing field. Interestingly, ridehailing and hospitality also show differences, when looking at platforms and incumbents. The use of business strategies was more explicit and differentiated in ridehailing than hospitality. While Uber developed strategic alliances to seek collaboration and create partnerships, this practice was less visible at Airbnb. This may be due to the way both ecosystems differ in their customer services. On incumbents side, hotels' cognitive emotions appear more nuanced and accommodative, while the taxi industry used more negative and conflictive rhetoric in response to Uber. Furthermore, as far as industry dynamics is concerned, the absorption of app technology by taxis indicates Uber's dominance. This contrasts with Airbnb and hotels, which have rather converged in terms of market strategies and use of technology to one market.

4 Conclusion and Recommendations

Uber and Airbnb both have sought to disrupt and dominate their respective industries through multifaceted tactics aimed at reshaping regulations and public perception. The longitudinal perspective taken in our research has, however, revealed that ridehailing and homesharing each have evolved differently when it comes to institutional tactics and regulations. Two key differences can be highlighted. First, taxis adopted a more confrontational stance compared to the more nuanced and accommodative approach of hotels. Second, while Uber's dominance is reflected taxis absorption of app technology, the convergence of market strategies between Airbnb and hotels suggests a more balanced competition within the hospitality sector. Since this indicates that not all sharing businesses are the same, we recommend governments to tailor-make their institutional frameworks to the needs of each sharing business for balancing out innovation, consumer interest and fair competition in smart city contexts.

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Experience in Implementation of Internet of Things Technologies in Management Practices: from Optimization to Innovation

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Abstract. *This paper examines the experience of implementing Internet of Things (IoT) technologies in the field of management and examines their impact on optimization and innovative changes. Examples of successful IoT implementations are analyzed and specific cases of solving management problems using these technologies are provided. The paper reveals the technological landscape of IoT in management identifies changes in the management approach and considers the creation of adaptive and reactive management strategies. The difficulties of implementing IoT technologies in management practice are outlined and the ways of future research are indicated.*

Keywords. *Internet of Things, Management, Innovation, Strategy.*

1 Introduction

In today's world, Internet of Things (IoT) technologies define new standards for effective management (Ashton, 2009) and development of enterprises. The implementation of IoT in management practices is becoming a necessity for enterprises that seek not only to optimize their activities (Brous et al., 2020), but also to achieve a higher level of innovation (El Khatib et al., 2023). The works consider important aspects of the experience of implementing IoT technologies in the field of management, exploring ways from optimizing routine processes to creating innovative strategies.

Noting the rapid and radical changes in the technology landscape, proposed paper examines how the use of sensors, communications and analytics enables enterprises to collect and analyze vast amounts of data in real time. Beyond traditional management, IoT adoption opens up new opportunities for automation, prediction, and integration, enabling adaptive and reactive management strategies.

The paper also examines practical examples of successful implementation of IoT technologies in large and medium-sized companies, demonstrating how these innovations can transform standard business processes and become a key factor for competitiveness. Thanks to a structured approach and analysis of important challenges, the article tries to identify the best practices of implementing IoT in management practices and determine the prospects for the development of this exciting and promising direction.

2 Technological Landscape of IoT in Management

The technological landscape of the IoT consists of three main components that interact to ensure efficiency and integration into management processes: sensors, communication and analytics (Figure 1).

Sensors play a key role in collecting data from the environment. These small devices can measure various parameters such as temperature, humidity, pressure, movement and many others. Collection of this data in real time provides an opportunity to receive accurate and up-to-date information about the state of objects or processes being studied.

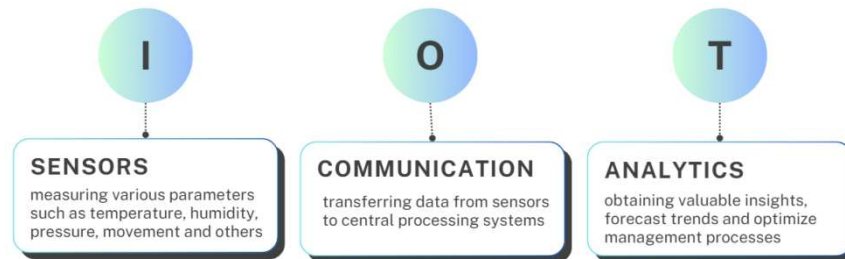


Figure 1. Internet of Things main components (Source: Authors' work)

Communication plays an important role in transferring data from sensors to central processing systems. Wireless communication technologies such as Wi-Fi, Bluetooth, NB-IoT, or LoRaWAN provide reliable and efficient information exchange between devices.

Analytics is the key stage of data processing. The application of various algorithms and machine learning tools allows you to use this data to obtain valuable insights, forecast trends and optimize management processes.

The emergence and spread of digital platforms have significantly changed traditional business models and interaction with consumers. (Aarne Viheriävaara, 2023) explores the key digital benefits that underpin the success of such platforms in today's economic environment. IoT technologies make it much easier to collect and analyze large amounts of data in real time. Instead of the traditional after-the-fact approach to data processing, IoT allows businesses to gain an instant view of the state of various aspects of their operations. In particular, manufacturing companies can use sensors on equipment to monitor its operation and predict possible breakdowns, allowing for maintenance before serious problems arise. In the field of logistics, the use of IoT allows for real-time monitoring of the movement of goods, optimization of routing and timely response to changes in the supply chain. Real-time data collection and analysis provided by IoT technologies is becoming a key competitive advantage for enterprises, allowing them to respond quickly to changes, improve business processes and ensure effective management.

3 Changes in the Management Approach due to the Introduction of IoT

The advantages of using IoT, shown in Figure 2, lead to changes in management approach (Dr. Bhagwati et al., 2021).

One of the key benefits of implementing IoT technologies into management practices is the ability to automate and optimize routine business processes. Sensors located in different parts of the enterprise provide a constant flow of data, which allows you to effectively monitor and control various aspects of the activity. In the field of production, the implementation of IoT allows you to automate the monitoring of equipment, identify moments of increased energy consumption or possible breakdowns, thereby reducing downtime and the risk of accidents (Soori et al., 2023). In the field of logistics, sensors on vehicles and cargo allow for real-time tracking of location and transportation conditions, which contributes to more efficient route planning and inventory management. Such automation not only saves time and resources, but also reduces the likelihood of human error, improving the quality of management decisions and increasing overall productivity.

The implementation of IoT expands the capabilities of managerial forecasting by providing access to more accurate and complete information. Analytics, based on real-time data, allows you to create more accurate and reliable forecasts regarding the development of events, demand for goods, or the

state of equipment. In the retail sector, sensors on shelves can automatically monitor stock levels and highlight the need for replenishment. This avoids losses from lost sales or overpaid inventory. In finance, IoT adoption can provide banks and financial institutions with accurate information about payment transactions, helping to detect fraud and optimize customer service. This increase in the accuracy of management forecasts allows managers to make more informed and strategic decisions, and increases their ability to adapt to changes in the business environment.



Figure 2. The most notable and apparent Internet of Things advantages (Source: Authors' work)

One of the important changes that the introduction of IoT technologies brings to management practices is the possibility of creating adaptive and reactive strategies. Data collected in real time allows companies to quickly respond to changes in the internal and external environment. For example, manufacturing companies can use data from sensors to instantly adjust production processes in response to changes in the work environment or market demand. In the service sector, the implementation of IoT allows to quickly adapt services to changing customer needs based on the collection and analysis of their consumer behavior. Also, real-time data allows enterprises to create reactive management strategies, because prompt receipt of information about events and trends allows effective response to challenges and opportunities. Real-time monitoring and data analysis systems can automatically detect anomalies or problems in work, notifying managers and employees of immediate measures to solve them. For example, in the energy industry, sensors can detect energy leaks or malfunctions in equipment, helping to prevent accidents and effectively manage resources.

However, for the successful implementation of IoT technology in the business model, it needs to be clearly defined (Sorri, 2023). Creating adaptive and reactive management strategies is a key aspect in the context of changes in the business environment. The integration of IoT technologies allows businesses to be flexible and quick to respond to changes, which is critical in today's environment of competition and uncertainty.

4. Practical Examples of Successful Implementation of IoT

Large corporations around the world have already shown great interest in implementing Internet of Things technologies to optimize production processes, increase productivity and improve competitiveness.

One example is General Electric (GE), which has implemented an IoT-based equipment monitoring system in its factories (Parris). Sensors located on the equipment send data about the state and operation of the machines in real time. This allows GE to detect problems and perform routine maintenance before major failures occur, reducing downtime and saving on repair costs.

Another example is IBM, which is implementing IoT-based smart building (Peterson et al., 2018) and energy efficiency management systems. Sensors measure energy consumption, temperature and other parameters, which allow you to effectively manage air conditioning and lighting systems, as well as identify places where you can save energy.

Medium-sized enterprises are also showing an active interest in the implementation of Internet of Things technologies, finding effective solutions for their industry. For instance, farmers use IoT to optimize agricultural processes. A sensor system in the field measures soil moisture, temperature and

other parameters and sends the data to a cloud server. A farmer can remotely monitor and control irrigation, optimizing water use and increasing yields. Figure 3 shows the amount of investment in each application of IoT in agriculture, as per Statista (Vailshery, 2022):

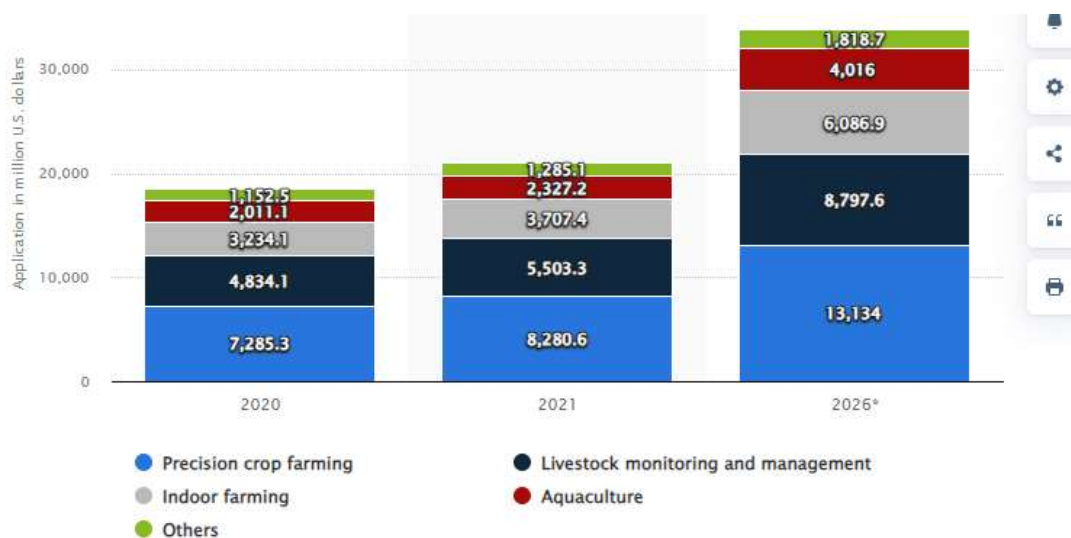


Figure 3. Application of IoT in agriculture (Source: Vailshery, 2022)

In the field of retail trade, the company Zippin implemented a cashless payment system based on IoT (Milam, 2023). Sensors and cameras in the store automatically track the products that the customer puts in the cart, and after leaving the store, the payment is automatically withdrawn from his account. This not only speeds up the shopping process, but also reduces queues and improves customer convenience.

The development of the Internet of Things has created new opportunities for platform businesses, and (Jung et al., 2021) examines the mechanics of platforms, bringing together the perspectives of IoT, platforms and ecosystems, using the example of three successful IoT platforms (Airbnb, Amazon and Google) to show that platforms are not only available to digital players, and highlights key success factors for IoT platform development and management.

The introduction of Internet of Things technologies has a significant impact on business processes and the competitiveness of companies. Reducing costs, increasing efficiency and being able to quickly respond to changes in the environment make these technologies a key factor for business success in today's world. Large and medium-sized companies, having successfully implemented IoT, observe increased productivity, improved service quality, as well as the opportunity to enter new markets and attract new customers. As a result, the competitiveness of enterprises increases, and their business processes become more flexible and adaptable to changes in the modern business environment.

5. Challenges of Implementation IoT Technologies into Management Practices

One result of the challenges associated with the implementation of IoT technologies is the provision of cyber security (Alazzawi et al., 2020). The increase in the number of connected devices creates new entry points for phishing attacks and cybercriminals. It is important to ensure security measures at every stage of implementation, starting from sensors and ending with data processing on servers. Companies must actively work to develop and implement modern cyber security measures, encryption and incident detection systems to protect data privacy and integrity. It is important for platforms to combine the digital and traditional worlds, while remaining reliable and secure for further growth strategy (Stange, 2022).

Another challenge is the integration of IoT technologies with the existing IT infrastructures of the enterprise. Many companies have various systems developed at different stages of business development. The implementation of IoT may require significant changes and adaptations in already existing technical solutions. Data integration, protocol standardization, and the development of specialized application programming interfaces (APIs) are key aspects of successful IoT integration with existing systems. Lack of consistency can lead to inconsistencies and system failures. The implementation of IoT is accompanied by a significant increase in the volume of collected and processed data. Managing these large volumes of information can cause problems related to their storage, processing and analysis. Effective scaling of data processing systems, use of cloud computing, and development of data analysis algorithms are key aspects of addressing this challenge.

One of the key challenges faced by enterprises when implementing IoT technologies into management practices is the high costs of the implementation process itself and staff training. The costs of acquiring and installing sensors, data collection and transmission equipment, and deploying the relevant infrastructures can be significant. In addition, investments in the development of adapted software solutions and ensuring cyber security are a necessary step in the implementation of IoT. Also large costs are associated with the need to update existing systems and integrate new technologies into the already existing business stack. It may require significant effort and financial resources to ensure the compatibility of new technologies with existing systems.

In response to these challenges, businesses must carefully plan their investments, ensuring a balance between costs and expected benefits. The relevance and popularity of such technologies as the Internet of Things lead to the study of new rules of platform ecosystem strategies (Hanelt et al., 2020).

6. Prospects for Development and Tasks for Future Research

In the context of the introduction of IoT technologies into management practices, broad prospects for development are opening up, but there are a number of tasks that should be taken into account for further research and improvement of this direction.

One of the key perspectives for future research is the development and improvement of methods for ensuring cyber security and data privacy in IoT systems. As a large volume of data is transmitted and processed in real time, this places increased demands on systems for protecting against cyber threats and ensuring the privacy of personal information. Research in the development of new encryption methods, authentication, and protection against attacks will provide greater security for IoT systems and make them more popular for widespread use in various industries.

Further research should be aimed at improving management and analytics systems in the context of using IoT data. The development of more efficient algorithms for processing large volumes of data, as well as the expansion of machine learning and artificial intelligence for analyzing and predicting the state of systems, will allow businesses to obtain more accurate and useful insights.

7. Conclusions

Consequently, the introduction of IoT technologies into management practices has a significant impact on increasing efficiency, optimizing business processes and increasing the competitiveness of enterprises. Automation, real-time data collection and analysis empower managers to make informed and strategic decisions. Also, it is important to consider the challenges that arise when implementing IoT technologies. In particular, the costs of implementing and training staff, ensuring cyber security and addressing data privacy issues are identified as major challenges that require attention and investment. Future research should address these challenges, as well as the development of new technologies that will ensure the sustainability and improvement of IoT systems

Therefore, Internet of Things technologies are already playing an important role in shaping modern business, and their influence on management practices will only grow in the future. Proper implementation and effective use of these technologies can be the key to the success of enterprises in a rapidly changing world.

Acknowledgement

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Sharing Systems in Urban Mobility

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Abstract. *In the modern world, there is no ordinary day without some kind of sharing, which can be material and immaterial. The topic of the paper is sharing economy in the field of urban mobility. The first part contains an introduction to sharing systems. Then follows sharing of types in urban mobility. This section describes the sharing hierarchy and four existing models in general. In the hierarchy, there are three major groups. First is sharing of a vehicle, then sharing of a passenger ride and the last group is sharing of a delivery ride. The models show the functioning of the systems independent of the type of vehicle. In a more detailed description of the mentioned categories and models, the advantages as well as disadvantages of the same are listed. Finally, examples of shared systems in the Republic of Serbia are given.*

Keywords. *Sharing economy, transportation systems, shared urban mobility*

1 Introduction

The sharing economy has been present in a large number of different spheres in our lives for years. The question is, what are reasons and why did this form of sharing occur? After the last world economic crisis, the principles of sharing are used more and more. The mentioned principles are based on business that goods can be used more than once and that single-use things are eliminated as much as possible. These procedures are not only good from an economic point of view, but also protect the environment (Ciari, 2012). The roles and perspectives of users, companies and municipal authorities in the institutionalization of the sharing economy in different geographic contexts have very often been the subject of previous research. This contributed to defining the main characteristics of the sharing economy, such stakeholders, the advantages, the disadvantages and various challenges during the implementation of the concept. From the user's perspective, research on motivation is particularly useful, with an emphasis on perceived benefits reflected in cost savings. An essential observation from a business standpoint is that the sharing economy is not inherently sustainable (Mont, 2020). It is evident that the urban governance perspective on the sharing economy differs across geographical contexts. These variances are mainly influenced by the sustainability challenges encountered by different cities and the objectives they aim to achieve (Reddick, 2020; Yang, 2020).

The increasing congestion in cities is caused by the small number of occupied vehicles, i.e. most often there is only the driver in the car without any other passengers. Furthermore, in almost all major cities there is a lack of free parking spaces, low vehicle speeds, increased stress and nervousness in traffic. Then the big expenses related to a private car. The main characteristic of shared mobility is that instead of private vehicle, use vehicle that is intended for shared use. With the advent of smartphones, and thus applications, sharing in urban mobility is becoming more and more simple and comes to the fore.

2 Sharing Types in Urban Mobility

2.1 Categories of Shared Mobility

Shared mobility can be defined as subgroup of sharing economy and allows users to use the type of transport they need, mostly for the short term. The following figure shows the mobility sharing hierarchy and includes a wide range of sharing in the field of traffic.

As can be seen on the mobility sharing hierarchy (Figure 1), there are three major groups. First is sharing of a vehicle, then sharing of a passenger ride and the last group is sharing of a delivery ride. The carsharing system has the following characteristics: it can reduce the ownership and/or use of private cars, and it can reduce the kilometers driven. In addition to above, one of the biggest benefits is that it can reduce the demand for parking spaces in cities (Mouratidis, Peters, van Wee, 2021). More about this system is given below.

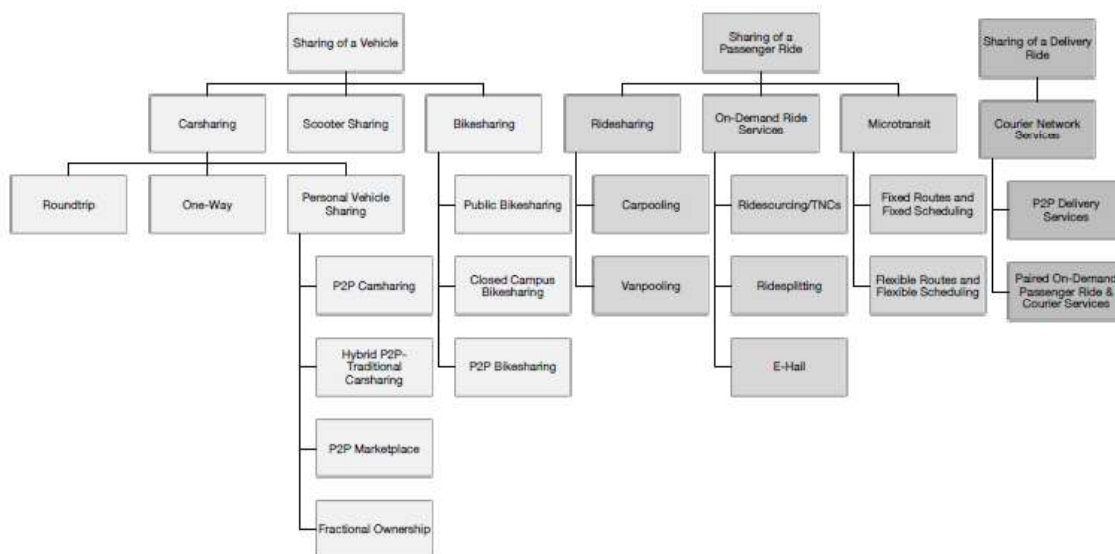


Figure 1. Hierarchy of shared mobility (Source: Shaheen, Bansal, Chan, Cohen. *Mobility and the Sharing Economy*, 2016)

E-scooter sharing emerged as the last subset of vehicle sharing. The mass appearance of micromobiles dates back to 2017. Among the first cities for sharing e-scooters are Barcelona and Milan in Europe, while in the United States the city of San Francisco and Columbia (Shaheen, Bansal, Chan, Cohen, 2016). Today, almost all major cities of the world have this type of sharing. There are two types of e-scooter sharing. The first system operates on station principle. The e-scooter must be returned to the official station that is intended for parking the same. The second system is free-floating and this kind of system is more popular in the cities. In the last period, more and more employees use e-scooters to make work trips, as well as students to go to universities. E-scooters are replacing trips by cars and public transport.

With the help of bike sharing system, it is possible to increase the percentage of bicycles in the daily trips, and in addition, it can replace the use of public transport or a passenger car. Among the biggest contributions are the increases in physical activity levels as well as travel time savings to the users (Teixeira, 2021). The big advantage of this form of sharing is also that it can reduce congestion in cities and reduce traffic density on roads (Mouratidis, Peters, van Wee, 2021). In recent years, station-less bike sharing programs have been launched worldwide, serving as significant representatives of the sharing economy (Yang, 2020). The rapid development of digital technology has impacted bike sharing systems as well, leading to the emergence of numerous digital platforms in recent times. These platforms have become the driving force behind the expansion of the sharing economy, reshaping organizational growth strategies, control concepts, and inter-organizational relations (Li, 2023).

The second large group in the hierarchy is sharing of a passenger ride, which consists ridesharing, on-demand ride services and microtransit. Ridesharing is based on sharing a ride among those people who have common place of departure and final destination. This sharing group is further broken down into carpooling and vanpooling. The last subgroup includes vans with up to 15 seats. The subgroup on-demand ride services can be treated as the opposite of classic ridesharing. In this case, the emphasis is not on the driver, who offers a ride, but on the passenger, who is looking for a ride. This includes the following categories: ridesourcing, ridesplitting and e-hall (Shaheen, Bansal, Chan, Cohen, 2016). Ridesourcing can be defined as a service similar to taxi service. One of the biggest disadvantages of this type of sharing is that sustainable mobility in cities can be undermined due to the service on personal demand at significantly lower costs than taxis or public transport. The positive side of ridesourcing is that it reduces the demand for parking spaces (Mouratidis, Peters, van Wee, 2021). It is impossible to realize the mentioned trips without mobile applications. Ridesplitting is a newer form of ridesourcing, where the emphasis is on sharing the ride and sharing the cost of trip among those who have similar routes. Companies are in charge of such services. Many of these systems recommend that passengers gather at precisely designated intersections. E-hall is at the last place in this group, which actually means a taxi service in the modern exit. Instead of calling a taxi service with a classic phone call, users order taxis through mobile applications. In recent years, along with this change, taxi driving has increased. The third form of sharing of a passenger ride is microtransit, which involves flexible routing, scheduling or both. There are two categories within microtransit: fixed route, fixed schedule and flexible route with on-demand scheduling. Private companies, but often also public transport agencies mostly operate these services. Sharing of a delivery ride stands out as a special group. The service is often referred to under another name, which is flexible delivery of goods. Couriers connect via the platform with the freight. It is typical for couriers to use their own automobiles, bicycles and e-scooters. Today there are two types of business: a) peer-to-peer delivery services and b) paired on-demand passenger ride and couriers services (Shaheen, Bansal, Chan, Cohen, 2016).

2.2. Shared mobility models

In recent years, four models have been established for aforementioned categories in the sharing hierarchy (Figure 2). The models show the functioning of the systems independent of the type of vehicle. The first model called peer-to peer or car rental. Car owners can give their vehicles when they are not in use to other people. Between the owner and the user stands a broker who monitors supply and demand and is available to both parties. Today, the online platform is more and more common, but the broker still monitors the user's payments. The broker works on a percentage of the income. The most famous system of this model is „Turo“ (Shaheen, Bansal, Chan, Cohen, 2016).

The following model is often referred to as a modern car club. The history of this model dates back to 1987 and Switzerland, when the first classic car club was founded. Cars are owned by a provider, which may be parked at authorised parking space or may be free-floating. Clients mostly rent vehicles for short-term purposes and for one way-trips. Access to the cars is made possible through mobile applications. „Zipcar“ is one of the leading systems of this model (Santos, 2018). Systems for bicycles and e-scooters also work in this way.

The third model is the equivalent of the Uber system. Providers do not have their own fleet of cars, but they register individuals for drivers who own cars. Companies as well as brokers in Model 1 are present to track payments. This system is very similar to taxi services. The question is often asked to what extent this system affects and destroys the taxi market. Next to the Uber, Lyft is the second most famous system of this kind of model.

The latest model includes cars, vans and buses. When passengers travel long distances, it means they are making long-distance trips. Through the application, the client can enter the starting place and the final destination, as well as the date of departure. In this way, the user can find the vehicle and the driver who will make a trip. This also applies in the reverse case when the driver offers seats in the vehicle. The most successful systems of this model are BlaBlaCar, UberPool and LyftLine (Santos, 2018). This model can work based on the following principles: acquaintance-based, organization-based and ad hoc (Chan, Sheeren, 2012). Some of the advantages of this model are increase in the mobility of workers with lower incomes and the increase in the average number of vehicles occupied (Mouratidis, Peters, van Wee, 2021).

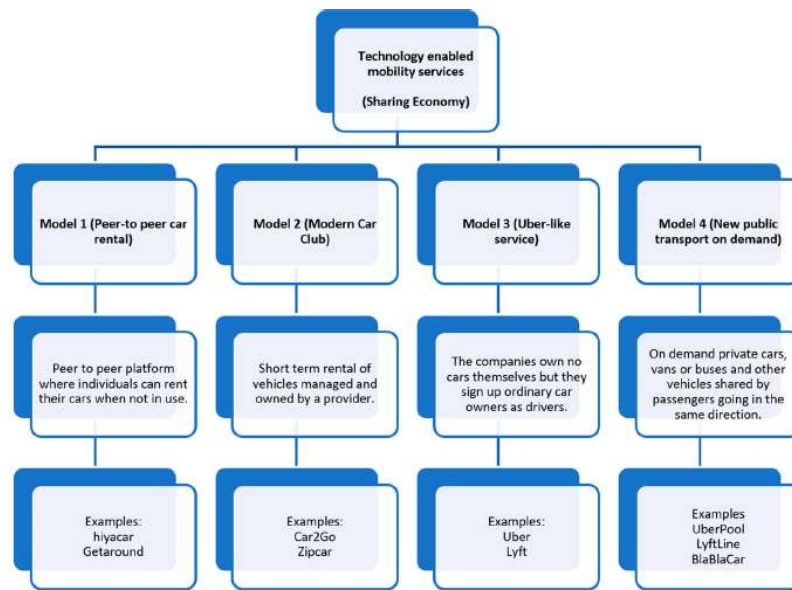


Figure 2. Shared mobility models (Source: Santos. Sustainable and Shared Mobility Models, 2018)

In practice, it's often observed that companies' institutional strategies for sharing economy concept vary from one city to another. They usually have similar launch strategies but use different institutional approaches as they address diverse spatial conditions. These conditions include local institutions (such as rules, norms, and cultures), specific physical elements of the place (such as infrastructure and urban mobility challenges), and issues of power (such as support and resistance) (Waes, 2020).

3 Sharing Systems in the Republic of Serbia

In the following section of the paper, several examples of sharing systems that operate in the territory of the Republic of Serbia are listed.

As in the world, as well as in the Republic of Serbia, the most famous carpooling system is BlaBlaCar. The most popular shared routes using the BlaBlaCar application in the territory of Serbia is realized on the following distances: Novi Sad – Belgrade, Niš – Belgrade, as well as Subotica – Novi Sad. Transportation can also be shared outside the country. Thus, based on the official data of the BlaBlaCar website, a large number of transport demand is registered on the following international routes: Belgrade – Zagreb, Belgrade – Ljubljana, Belgrade – Vienna and Novi Sad – Ljubljana. Through BlaBlaCar people can find and offer a trip. How does the BlaBlaCar work? If a person wants to travel from point A to point B, it is necessary to enter the place of departure and where the passenger wants to travel, as well as the time via the official website or mobile application. Then the person needs to make a reservation. With the reservation, the potential passenger receives the number of the driver with whom the person gets in touch and can find out more details about the trip. During or immediately after the completion of the trip, the passenger is obliged to pay the pre-agreed amount of the transportation as well as the rating of the driver via mobile application or website. In the opposite situation, when the driver offers trip via the mobile application or website, the procedure is the follow. The task of the driver is to indicate the starting and ending point of the trip. In addition, the date and time of departure should be specified (www.blablacar.rs).

The company "Twety" has e-scooters of the latest generation, which can develop a maximum speed of 25 km/h. The mentioned company currently operates in two cities in Serbia, namely Belgrade and Novi Sad. The rental of e-scooters is done through the application "Twety Scooter". It is necessary to scan the QR code or Matrix code at the beginning of the ride, as well as at the very end in order to charge for the ride. The bankcard must be connected to the application. The application also shows the location of the e-scooter that is ready to drive. (www.twety.app).

The city of Novi Sad has a system for renting public bicycles called "NS bike". There are 16 stations within the system where the bike can be rented at any time during the 24 hours of the rental season

(www.parkingns.rs/bicikl). Bike sharing systems can also be used for tourist purposes in cities. Examples of such cities are follows: Senta, Belgrade, Palić and Vrnjačka Banja.

4 Conclusion

Each of the systems mentioned in this paper contribute to great savings for the individual, and the most of them for society and the environment. Some of the examples are: electric and hybrid vehicles can be used in the carsharing system. Bike sharing and e-scooter sharing contribute the most to maintaining the environment and improving human health. Considering that, one vehicle is used by several users, this leads to a smaller number of private cars, fewer parts that are changed during service, which also causes less waste. When it comes to society, it can be pointed out that carpooling and ridesourcing enables the realization of trips even for those people who have low incomes or do not have a good connection with public transport.

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Reducing Transaction Costs of Epistemic Recognition through Online Platforms: Empowering Marginalised Academic Communities to Challenge Epistemic Injustice

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Abstract. *This paper offers a fresh perspective on the sharing economy by adopting the theoretical lens of transaction cost economics (TCE) with the aim of expanding the discussion on online platforms beyond a commercial context to examine their potential for social good. Focusing on the user experience, this study investigates under what conditions online platforms designed to empower marginalised academic communities in addressing epistemic injustice attract and retain prospective users by reducing the transaction costs associated with knowledge exchange between knowers and knowledge seekers. In this regard, the paper examines whether these platforms have the potential for growth or rather remain niche platforms primarily facilitating matchmaking within a small academic community and their knowledge seekers. Drawing on survey data from users of platforms such as 'Women Also Know Stuff', 'People of Colour Also Know Stuff', and 'LGBTQ Scholar Network', the study explores this phenomenon through a set of TCE-related variables, including registration process, functionality, personalisation, transaction uncertainty, sense of community, social identification with other users and platform, and direct and cross-network effects.*

Keywords. *Epistemic Injustice, Sharing Economy, Online Platforms, Women, People with Colour, LGBTQ+A, Transaction Cost Economics, Recognition.*

1 Introduction

Systematic biases persist within the processes of knowledge creation, utilization, and sharing. Existing biases target specific groups based on factors such as gender, race, disability, and geographical origin, especially impacting people from the Global South. Many scientific communities marginalized by these structural barriers are faced with the problem of recognition and commonly find their work ignored by mainstream academic and policy circles. These leads to epistemic injustice resulting in disparities in how dominant and non-dominant knowers are treated (Fricker, 2007). Initiatives are emerging to amplify marginalized academics' voices in public discourse and decision-making. Online platforms like 'Women Also Know Stuff' and 'People of Colour Also Know Stuff' are showcasing expertise and perspectives of marginalized communities and aim to tackle epistemic injustice.

Addressing epistemic injustice is often termed 'epistemic resistance,' (Medina, 2013) necessitating collective efforts beyond individual actions. Strategies like widespread intergroup integration, communities of epistemic resistance, and subaltern counter-publics are proposed to confront structural barriers (Schlüter, 2021). These approaches offer spaces for marginalized groups to share experiences, challenge dominant narratives, and resist epistemic injustice. Online platforms and academic social networking sites are advocated as solutions to recognize marginalized groups, offering advantages such as fostering social connections, facilitating collaboration, and enhancing visibility (Treem & Leonardi, 2013). These platforms promote interdisciplinary and international collaboration, improve information management, and provide alternative metrics for assessing academic impact.

Academic social networking sites offer opportunities for marginalized researchers, aiding in networking, knowledge dissemination, and scholarly engagement. However, it remains unclear if these platforms effectively support marginalized communities in engaging with and promoting their work beyond hegemonic academic landscapes. Furthermore, what factors may favour or impede the attraction and retention of platform members and eventually determine the growth of these communities and the accomplishment of their mission merits further analysis. This article thus investigates the role of online platforms in sharing and promoting knowledge among marginalized communities to tackle

epistemic injustice, employing TCE as a novel framework in this context. This study also aims to explore whether these online platforms effectively economize on transaction costs linked to knowledge exchange between knowers and seekers. By focusing on the role of a set of TCE-related factors this study examines whether these platforms could expand beyond niche status, facilitating broader connections beyond a small academic circle and its knowledge seekers.

2 The Conceptualisation of Transaction Features

The term TCE is typically used to understand costs related to economic exchange between agents. It encompasses expenses associated with searching, contacting, and contracting (Munger, 2018). According to TCE, when there are environmental uncertainties and a low volume of exchanges, transaction costs increase for organizations and individuals. To minimize these costs, entities choose the most suitable governance structures (Williamson, 1985). Online sharing platforms, functioning as intermediaries, leverage technology to optimize resource sharing, thus lowering transaction costs for users. By offering easy accessibility, personalized services, and reducing uncertainties, these platforms facilitate asset sharing and gain popularity among users (Li & Fang, 2022). While the role of online sharing platforms in reducing transaction costs has been studied in a commercial context, platforms developed for marginalized academic communities face similar uncertainties. As transaction costs influence the behaviours of transacting parties this study posits that the success of online sharing platforms designed to promote the research of marginalized scholars is intimately connected to the ability of the platform to govern exchange and reduce transaction costs associated with its usage. This study focuses on the role played by seven TCE-related variables in determining the willingness of its members to participate and disseminate their research through the platform; these variables are the following: registration process, functionality, personalisation, transaction uncertainty, sense of community, social identification with other users and platform, and direct and cross-network effects.

2.1 Ease of Registration

Online sharing platforms and their technological infrastructure lowers entry barriers for users, allowing them to share resources easily. These platforms are accessible to anyone with an internet connection and a device, enabling interaction with other users upon registration. They facilitate network participation and underutilized resource sharing while eliminating geographical barriers to knowledge exchange. However, the registration process on online platforms often requires users to share comprehensive personal information, known as the 'cost of registration' (Morath & Münster, 2018). The effectiveness of reducing transaction costs depends largely on the user-friendliness of this process. Complex registration procedures can discourage participation, emphasizing the importance of low-barrier accessibility to reduce transaction costs. This leads to the first hypothesis:

H1: The greater the ease of the registration to online research-sharing platforms, the greater the participation and dissemination of the research of marginalized academic communities.

2.2 Platform User Friendliness

Learning is often seen as the time and effort individuals invest in acquiring knowledge needed to effectively use a new service. This learning process incurs a cost for users, as they allocate time and effort, which may lead to abandonment if perceived as too high compared to the value gained (Dang et al., 2017). Hence, when users spend more time learning to navigate and utilize an online platform, it creates transaction costs. If the aim of an online sharing platform is to enhance user recognition, a simple learning process contributes to lowering transaction costs associated with promoting user knowledge. Accordingly:

H2: The greater the user-friendly functionality of online research-sharing platforms, the greater the participation and dissemination of the research of marginalized academic communities.

2.3 Customization of interactions with the platform

Asset specification refers to the degree to which tangible and intangible assets dedicated to one particular transaction can be shifted or used for different transactions. These assets include shared knowledge, human resources, physical assets, and company-specific processes. If an online sharing

platform transaction requires specialized assets, using alternative, less suitable assets becomes difficult, discouraging platform use (Jones & Leonard, 2007). For knowledge-sharing platforms, specialized assets are the expertise of registered users. As the number of users increases, the time and effort required to find appropriate knowledge also increases. To mitigate this, platforms adopt profile personalization capabilities, collecting personal data to offer targeted content through algorithmic models. Improved predictive capabilities allow users to find specific assets more quickly, reducing transaction costs (Vendemia, 2017). Effective personalization and predictive capabilities also discourage users from switching to alternative platforms. The third hypothesis is thus as follows:

H3: The greater the ability to personalize user profiles on online research-sharing platforms, the greater the participation and dissemination of the research of marginalised academic communities.

2.4 Transaction Uncertainty

User confidence in online sharing platforms is hindered by the absence of physical contact and uncertainties regarding the platform environment. Transaction uncertainty, which encompasses challenges associated with unknown factors increases transaction costs for users. To mitigate these costs, specific contractual arrangements are necessary (Hart & Moore, 1990). For online sharing platforms aimed at improving recognition of marginalized communities, branding and performance uncertainty are crucial. Branding uncertainty refers to challenges in determining the service provider's reputation, while performance uncertainty relates to assessing service quality (Teo & Yu, 2005). Integration mechanisms like member ratings and experience reviews play a vital role in mitigating these uncertainties. As branding and performance uncertainties decrease through user reviews or ratings, transaction costs decrease, facilitating the recognition of academicians using these platforms. Therefore:

H4: The greater the reliability of user reviews on online research-sharing platforms, the greater the participation and dissemination of the research of marginalized academic communities.

2.5 Sense of Community

Sense of Community (SoC) encompasses membership, influence, integration/fulfilment of needs, and shared emotional connection. In online platforms created for marginalized academic communities, a strong SoC plays a crucial role in reducing transaction costs associated with knowledge exchange. Members feeling connected and supported are more likely to engage effectively in collaboration, streamlining knowledge exchange processes (Sandefur & Laumann, 1998). There is also a positive correlation between SoC and trust. When the community becomes more connected, they develop more social norms to build trust and these community norms further reinforce this relationship by creating predictability and reliability in member actions, making them trustworthy (Blanchard et al., 2011). SoC facilitates smoother interactions, reducing transaction costs and enhancing the efficiency of knowledge exchange processes. Thus,

H5: The greater the feeling of sense of community on online research-sharing platforms, the greater the participation and dissemination of the research of marginalised academic communities.

2.6 Social Identification with Other Users and the Platform

SoC is closely linked with social identification, which is the perception of oneself as a member of a social group and feeling emotionally connected to other members. This fosters favourable perceptions of group members and leads to trust in others. Trust in community members is further reinforced by adherence to group norms, which are strengthened by individuals' identification with the group (Ashforth & Mael, 1989). A strong sense of social identification with other users in the platform enhances trust among community members. Social identification with other users is crucial for reducing transaction costs associated with knowledge exchange. This identification facilitates smoother interactions and knowledge exchange processes, ultimately reducing transaction costs for marginalized academic communities. Thus,

H6: The greater the social identification with other users on online research-sharing platforms, the greater the participation and dissemination of the research of marginalised academic communities.

The concept of social identification also involves developing a strong bond with organizations. Individuals may form a robust identification with organizations, such as online sharing platforms, based

on their perceived attractiveness, mission, principles, and leadership. Identification with the platform can lead to favourable perceptions of its users, fostering positive trusting beliefs about them. Perceived alignment in shared values enhances trusting beliefs among users, as people tend to trust others who resemble themselves (Ziegler & Golbeck, 2007). Social identification enhances trust among like-minded users, facilitates interaction, and ultimately reduces transaction costs for marginalized academic communities in terms of knowledge exchange. Therefore,

H7: The greater social identification with the online research sharing platforms, the greater the dissemination of the research of marginalised academic communities.

2.7 Network Effects

Network effects, a significant factor affecting transaction costs, occurs when the value of a product or service increases with its usage. This is because more users make the product or service more visible, attracting even more users. Network effects reduce information asymmetry between users, making it easier to access information about products and services. In the absence of symmetric information between transaction partners, individuals cannot make rational decisions, increasing the transaction cost for them. Therefore, a growing number of users in the network enables better information sharing and optimizes resource sharing (Barolli et al., 2008).

We focus on two types of networks effects: direct network effects and cross-network effects. The direct network effect is associated with the benefits derived from increasing users and network size. Cross-network effects, on the other hand, involve ties with other networks that provide complementary information (White et al., 2016). As the user base grows, there is increased sharing of information about products and services. From the perspective of direct network effects, the number of users has a significant impact on online platforms. Higher transaction frequency and product availability positively affect transaction costs. As the number of users in the network increase, it provides utility and benefits to users. This expanding user base enhances the recognition of marginalized academic communities. Thus,

H8: The greater the number of already active users registered on online research-sharing platforms, the greater the participation and dissemination of the research of marginalized academic communities.

Regarding cross-network effects, association with other online platforms is also helpful in reducing the transaction cost for platform users. As the number of users increases, more information is available inside and outside the platform. A greater volume of information shared in the platform, virtual communities significantly reduce the information asymmetry for outsiders while making decisions about the product and service. The cross-network effect, as a result, mitigates knowledge-related uncertainties for the potential users outside platform (Palvia et al., 2011). Therefore, if there is rich information promoting the expertise of marginalised academicians in the online platform and this information is disseminated in other social media platforms, the indirect network effect reduces the transaction cost of recognition for these academics. Therefore,

H9: The greater the sharing of content from online research-sharing platforms with other social networks, the greater the participation and dissemination of the research of marginalized academic communities.

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Mapping Sharing Economy Landscapes: A Segmentation Analysis of World's Cities

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Abstract. *The sharing economy offers a contemporary and environmentally friendly approach to distributing resources, goods, and services among individuals, facilitating waste reduction and sustainable consumption. Over time, sharing platforms have emerged across various sectors such as tourism, transportation, finance, education, and others. The following paper focuses on global cities and the development of the sharing economy ecosystem within them. The main goal of this study is to map certain types of cities according to the level of sharing economy ecosystem development. The conducted analysis is the cluster analysis, using the k-means algorithm on the Sharing Economy Index (SEI) data for 2023. The results show that three segments (Basicville, Mediapolis, and Coexistia) can be identified based on the analysis of nine proposed indicators. The pivotal importance of conducting this analysis lies in its ability to systematically compare cities belonging to similar clusters. Through such comparative assessments, invaluable insights emerge, facilitating the refinement and optimization of sharing economy systems across diverse urban landscapes.*

Keywords. *Sharing economy, Sharing Economy Index, cluster analysis, sharing economy ecosystem.*

1 Introduction

Over recent years, there has been a noticeable increase in the sharing economy industry, which affects different aspects of today's social and economic system. The Sharing Economy (SE) involves business models or activities that encourage the sharing of underused assets, aiming to enhance overall efficiency and sustainability (Belk, 2014; Puschmann & Alt, 2016). All SE business models can be divided into three main types: the SE models whose object of sharing is a physical asset, the SE models whose object of sharing is service, and SE models whose object of sharing is also a service with the inclusion of physical asset (Bojkovic et al., 2022). Physical-asset-based SE models are the models that offer assets such as property, vehicle, etc., and the best-known brands from this category are Airbnb (platform for offering accommodation), Turo (business model that offers vehicles), and BlaBlaCar (a platform that connects the users to reduce the number of empty seats in cars). The second type of SE businesses are the businesses that are offering the skills and time of individuals. They include activities such as object cleaning, giving classes, babysitting, and others. The most popular service-based SE models are Sittingaround (a babysitting service platform), TaskRabbit (a platform that offers cleaning services), and Superprof (a platform for tutorials). The service-sharing economy models that require physical assets to fulfil the service usually refer to driving service companies such as Lyft and Uber (Codagnone, Abadie, & Biagi, 2016; Farrell & Greig, 2016; Kuhn & Maleki, 2017).

The impact of the sharing economy can be measured through economic lens (revenue generated, GDP contribution, employment), social lens (user participation, environmental impact), technological adoption (digital platforms), trust (number of reviews, trust metrics) and others (Vaughan & Hawksworth, 2014; Simic & Liem, 2023). Among these metrics, the one that attracted our attention is the composite indicator approach and the Sharing Economy Index (SEI) developed by (ConsumerChoiceCenter, 2024). This multidimensional metric tries to encapsulate the complexity of sharing economy ecosystem using nine indicators.

Given the prevalence of cities adopting smart, digitally driven, urban, and environmentally conscious practices through the integration of sharing economy ecosystems, the following study aims to categorise these cities into distinct segments based on their level of sharing ecosystem development measured by SEI. This segmentation aims to provide insights into cities' diverse sharing ecosystems and identify those with more and less developed sharing ecosystem. As a segmentation analysis, cluster analysis was chosen (Gower, 1967).

The paper is structured as follows. The second section reviews previous attempts at cluster analysis implementation in the sharing economy. Subsequently, the following section explains the Sharing Economy Index (SEI), its indicators, as well as the ranking methodology. After explaining the SEI, the conducted case study setting is presented. Ultimately, the paper ends with an overview of the results, the main conclusions and some research limitations.

2 Implementation of cluster analysis in sharing economy

This paper has a goal of dividing cities into clusters according to their similarities in the Sharing Economy Index, by using the cluster analysis. In relation to the sharing economy, the cluster analysis has already been used for similar purpose in the past. Jovanović and co-authors (2023) segmented European countries based on the participation of citizens in the shared mobility. For that purpose, they used 12 indicators and observed 26 European countries, with the k-means algorithm of cluster analysis. The cluster analysis showed that European countries should be segmented into three clusters and that the city's geographical position did not impact the cluster membership.

Another paper categorised European countries based on the characteristics of individuals who utilise shared accommodation services. Using data from the Eurostat survey on household internet usage in 2019, researchers also applied the k-means clustering algorithm to analyse the data. The findings suggested that there are variations in consumer behaviour across Europe, particularly influenced by socio-economic factors. The Western European nations showed increased usage, and Central European countries had a mid-level of usage, whereas the Eastern European countries have not yet developed shared accommodation services (Maričić et al, 2023).

Mátrai and Tóth (2020) attempted segmenting 64 global public bike sharing systems. Their analysis included several steps: multinomial regression, cluster analysis (k-means), internal cluster validation, and external cluster validation. The outcome of the analyses were four clusters that differed in ownership and the operator type. One of the conclusions showed that geographical location does not have impact on the cluster structure, since the clusters were not homogeneous in this way.

Lastly, one of the papers defined the positive relationship between the bike sharing systems and public expenditures. For the analysis, the authors analysed the Polish market of bike sharing containing 19 bike-sharing systems that, on average, have 44 stations and 488 bikes. To analyse the data, a cluster analysis with the k-means method was used. The analysis has divided all systems into three clusters depending on the number of stations and owned bikes and has shown that the municipality budget has a very high correlation (94%) with the development level of the bike sharing systems in Poland (Suchanek & Wołek, 2018).

The four presented studies show that segmentation analysis in the field of sharing economy is a prominent topic which attracts interest.

3 Sharing Economy Index (SEI)

The Sharing Economy Index (SEI), introduced in 2020 by the Consumer Choice Center, aims to rank 60 global cities to assist consumers in selecting destinations aligned with their sharing economy preferences. The ranking system of Index's fourth edition comprises nine indicators, with a maximum score of 160, evaluating aspects such as the availability and accessibility of services like ride-hailing, carpooling, professional car sharing, ultra-fast delivery apps, peer-to-peer lending, gym sharing, library sharing, flat sharing, and e-scooters (ConsumerChoiceCenter, 2024).

Ride-hailing involves hiring a private driver and vehicle via a platform to reach a specified destination, with cities scored based on availability and accessibility, garnering up to 40 points. Carpooling, which involves sharing rides for different purposes, accounts for 10 points. Professional car sharing, where individuals rent private vehicles for long-term use from others or companies through sharing economy platforms, is assessed for a maximum of 30 points. Ultra-fast delivery apps, which swiftly deliver restaurant orders to consumers within 15 minutes, contribute 10 points if available. Peer-to-peer lending, facilitating direct borrowing from individuals through fintech platforms, is evaluated based on regulatory factors impacting sector growth, with a potential score of 20 points. Gym sharing, determined by the ease of accessing gyms or fitness studios via mobile apps, earns 10 points if feasible. Library-sharing apps and websites, enabling access to multiple libraries, contribute up to 10 points. Flat sharing, allowing travellers to rent accommodations from private homeowners instead of hotels, is rated for a maximum of 20 points. Lastly, cities with available e-scooters for rental receive an additional 10 points (ConsumerChoiceCenter.com, 2024).

4 Case study settings

The goal of this study is to segment 60 cities ranked by the SEI using the nine indicators and the most recent data, data for the year 2023. To better understand the similarities and differences between cities and ease the comparability between the cities, we wanted to segment them into several homogeneous groups. As the grouping algorithm, cluster analysis was chosen (Maricic, Uskokovic & Jeremic, 2023). Implementing cluster analysis in the sharing economy is crucial for identifying cities with similar sharing dynamics, enabling targeted interventions and optimising resource allocation to promote sustainable growth and resilience.

We opted for the k-means algorithm as it has previously been used in the field of research (Maricic et al., 2023), as well as the fact that the results of the k-means algorithm are easier to interpret and communicate with the decision-makers. Besides, the k-means algorithm is an often-used unsupervised machine learning technique used for clustering. It operates by iteratively partitioning the dataset into k clusters based on the similarity of data points, aiming to minimise the variance within each cluster (Maricic, Ignjatovic & Jeremic, 2022). This iterative process involves recalculating cluster centroids and assigning data points to the nearest centroid until convergence, providing a straightforward and efficient method for pattern recognition and data segmentation. The k-means algorithm was not repeated to ensure that the best partitioning was achieved, as the analysis was done in SPSS 23, which does not allow different initialisation methods.

To determine the best cluster structure, we observed the WSS (Within-Cluster Sum of Squares) and the distribution of cities per cluster. Namely, we did not want to retain cluster structures with a small number of cities (Fraley & Raftery, 1998). Additionally, we did not normalise the data as we observed indicator data, which was almost all on the same scale.

5 Results

The cities were grouped based on the indicator values of the Sharing Economy Index and divided into three segments according to their sharing economy ecosystem development. The three segments are: Basicville – cities with the low SE ecosystem development, Mediapolis – cities with the middle SE ecosystem development, and Coexistia – cities with highly developed SE ecosystems. Based on the performed ANOVA analysis, two out of nine indicators are similar for all global cities. Those indications are carpool app/platform ($p=0.794$) and e-scooters ($p=0.477$). One more indicator is very close to the insignificance level, and it is gym sharing ($p=0.048$). Global cities were analysed based on the remaining six indicators that are significant according to ANOVA analysis.

The *Basicville* cluster refers to the global cities in which most of the indicators have the lowest value between three clusters. The rail-hailing is non-existent (mean 00.00), while the ultra-fast delivery apps are almost non-existent with the mean value of 2.86. Peer-to-peer lending (mean 7.86) and flat sharing (mean 8.43) do exist in these cities but are not developed enough and have certain restrictions. Surprisingly, out of all defined clusters, library sharing (mean 10.00) is the most developed in Basicville

cities. Professional car sharing had a high development with mean value 27.14 out of 30 (Table 1). This cluster consists of seven cities, and its members are Athens, Copenhagen, Istanbul, Ljubljana, Luxembourg City, Sofia, and Tokyo.

Table 1. Mean results for Clusters (Source: Authors' work)

Characteristics	Basicville (mean)	Mediapolis (mean)	Coexistia (mean)
Ride-Hailing	0.00	34.17	28.41
Carpooling App or Platform	8.57	8.33	9.02
Professional Car Sharing	27.14	25.00	29.27
Ultra-fast Delivery Apps	2.86	8.33	8.29
Peer-to-peer Lending	7.86	9.58	14.39
Gym Sharing	7.14	6.67	9.27
Library Sharing	10.00	1.67	9.76
Flat Sharing	8.43	15.92	8.71
E-Scooters	8.57	10.00	9.27
Number of Cases	7	12	41

The second cluster consists of the cities that are relatively developed compared to the previous cluster and is named *Mediapolis*. The library sharing (mean 1.67) is poorly developed in these cities, while other types of sharing economy models are developed, but not to the highest level. Ride-hailing (mean 34.17) and flat-sharing (mean 15.92) are the most developed forms of SE in this cluster. Most of the cities have ultra-fast delivery apps with the mean value of 8.33 for the cluster representative. Additionally, besides having the developed system of professional car sharing (mean 25.00), this type of sharing economy is the least developed in Mediapolis cities. Mediapolis includes 12 cities, and the representatives of this cluster group are Belgrade, Buenos Aires, Mexico City, Minsk, Sao Paulo, and Tbilisi.

The last cluster is named Coexistia, since most of the six observed indicators have high values and are rally close to being the leaders, while two indicators have the highest mean values. The representative of this cluster is the leader in professional car sharing (mean 29.27) and peer-to-peer lending (mean 14.39). The least developed form of sharing economy in this segment is flat sharing (mean 8.71). Other indicator values show that even though these cities are not the leaders in all sharing economy models but are very close to being fully developed in those segments as well. This cluster includes 41 global cities, and some of the members are Amsterdam, Berlin, Bucharest, London, Madrid, New York City, Taipei, Vienna, and Zagreb.

6 Discussion and conclusion

The outcome of the analysis showed that global cities can be divided into three segments according to the presence and development level of the sharing economy ecosystem. All sharing economy models exist in every cluster, except for ride-hailing, which is non-existent in the first cluster (Basicville). The most developed SE model is professional car sharing, since all clusters have the mean value close to the highest possible (30). The limitation of the research was the significance level for two indicators. According to the ANOVA analysis, the values between the three groups for the indicators carpool app/platform ($p=0.794$) and e-scooters ($p=0.477$) do not differ. This could indicate that the two indicators could be removed from the ranking system or from the future segmentation analysis. Additionally, gym sharing had the significance of 0.048, which is very close to the value that is considered insignificant, raising the conclusion that gym sharing could also be relatively same among clusters. This means that these three indicators are possibly not the best indicators for explanation of the city's SE development. Another limitation is that the observed cities are from different continents, cultures, and size.

Future research activities could be divided into two directions. One direction is focusing on the current structure of SEI to develop indicators that vary more among cities. Indicators that could potentially be used may be found within other types of shearing economy models such as bike sharing models, education sharing models, etc. That will bring even better opportunities for the comparison of cities and more accurate results. The big advantage is also the ability to compare cities within one cluster, and among different clusters. This would enable cities to connect and further develop their sharing economy

ecosystem based on the knowledge collected from other cities. Ultimately, the future development of the sharing economy relies on integrating technology, balancing regulation, and fostering societal acceptance.

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Application of Blockchain in the Sharing Economy: Use Case of Ride-Sharing Platform

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Abstract. *Applications based on the business model of the sharing economy, which rely on traditional technologies, have trouble ensuring information traceability, transparency, and trust between their participants. Blockchain technology and smart contracts can help in overcoming these problems and improve efficiency. In this paper, the benefits that this technology can provide in support of sharing economy applications are presented. It also addresses which existing problems and challenges it can solve. The paper includes a use case of blockchain technology using the example of a ride-sharing platform. Although the participants and transactions in the described model are simplified, they are an excellent demonstration of how these technologies can improve the efficiency of the described system.*

Keywords. *sharing economy, blockchain, ride-sharing*

1 Introduction

One of the most remarkable trends in recent years has been the emergence of the sharing economy, which used to be often referred to as collaborative consumption or P2P (peer-to-peer) sharing. This socio-economic pattern emphasizes the efficacy of sharing, renting, or swapping items among society members brought about by digital networks. The whole definition of the sharing economy consists of different areas, such as travel, accommodation, and financial services.

The challenges in shared economy applications are establishing a system of trust and increasing transparency among all participants. These can be the main issues for such systems that are based on traditional technologies. Therefore, an alternative to the traditional way of implementing such applications should be presented. Blockchain technology has the potential to offer a solution and help overcome these challenges.

The authors of this paper propose the use of blockchain technology as an innovative solution for establishing verification and increasing transparency among all participants in shared economy applications. A proposal for such a system, based on blockchain technology, is described in the case of a ride-sharing platform.

The rest of the paper is divided into 5 sections. **Section 2** describes the basic concepts of blockchain technology. **In part 3** of the paper, it is explained how blockchain technology can make the sharing economy more efficient and what challenges it can address. Then, **in part 4**, a simplified use case is presented using the example of a ride-sharing platform. **Section 5** presents the conclusions, while **part 6** lists the references used for writing the paper.

2 Fundamentals of Blockchain Technology

Blockchain technology, conceived as a raw support for bitcoins, is a new paradigm of empowering various fields, and also concept of sharing economy (Frenken, 2019). Underneath all the buzzwords and jargon, Blockchain is an immutable, decentralized, and publicly distributed ledger that records computer transactions in a peer-to-peer network. Its main features include decentralization, integrity/immutability, publicity, and cryptography.

Using a dispersed network of nodes to store transaction data, blockchain technology functions on the premise of a decentralized ledger. Redundancy and traceability are introduced throughout, and traceability is introduced by replicating the structure that cannot be modified with transactions linked into blocks and connected through cryptography. The decentralized structure of a blockchain provides a peer-to-peer means of transaction, thereby avoiding the danger of any single point of failure. Consensus mechanisms such as Proof of Work (PoW) and Proof of Stake (PoS) are used to reach a general agreement among the network users to tell if a transaction is legal and the chronological order of blocks (Javaid, 2022). Proof-of-Stake (PoS) validators are selected based on the cryptocurrency they own, significantly decreasing the energy used and making the system more scalable.

On the other hand, in PoW, any investor needs to solve complicated problems to approve transactions and create new blocks. The Blockchain's intelligent contracts digitize the transaction process based on rules to improve trust and efficiency that removes intermediaries in peer-to-peer transactions (Lazareva, 2021). They allow automated payments, escrow services, and decentralized autonomous organizations (DAOs) to be used within the shared Economy. This assists with the reduction of costs and simplification of processes.

The first application of blockchain technology was the cryptocurrency Bitcoin. It has been globally accepted and represents an immutable system of e-payments. Following the successful development of the Bitcoin cryptocurrency and its support system, it became clear that blockchain technology has a much broader application. Through the use of smart contracts, it is possible to surpass simple transactions of buying and selling currencies. They represent a program that is recorded on the blockchain network and executed when predefined conditions are met (Swan, 2015). This new way of conducting transactions can be applied in many spheres of human organization and replace traditional technologies.

The following part of the paper describes the challenges of the shared economy that blockchain technology can respond to and help overcome.

3 Shared economy and blockchain: challenges and solutions

The emergence of social networks, the development of information technologies in general, and the integration with IoT devices have led to a broader application of the sharing economy. Additionally, blockchain technology is an innovation that can support such a business model without the misuse of platform providers. This is because, by its technical characteristics, this technology perfectly combines with the idea of the sharing economy. It is based on a peer-to-peer architecture, lacks a central institution that can control and manipulate the system, and once data is recorded, it is persistent and cannot be changed or deleted (Tschuchnig & et., 2023).

One of the main challenges of shared economy applications is **Trust and Security**. The mutual trust problem is one of the biggest problems a shared economy deals with, as here, people do not know each other at all and are strangers in many cases. Users will face many worries about the safety of their personal data, financial accounts, and selected merchants. These are the main problems that traditional transactions' recorded ledgers face. The ledgers use intermediaries to ensure the transactions' accountability and security.

Blockchain technology is here to solve this problem by offering a distributed ledger for transparent and secure transactions without intermediaries, further improving trustfulness and minimizing security issues during transactions (Mehrwald & et., 2019).

Another challenge of this model that also attracts a lot of attention from blockchain enthusiasts is the **cost of service providers**. Intermediation costs, such as high platform and transaction fees and high processing fees, are a few problems the shared economy faces today. This results in consumers paying higher costs, reduced service provider profits, and, consequently, overshadowing the advantages of the shared Economy. Intermediaries who facilitate these transactions tend to increase their expenses. Blockchain technology providing a direct peer-to-peer transaction can reduce these by clearing off the intermediaries (Standing, 2018). Intelligent contracts can cut down on this intermediary middleman task, saving time. Likewise, acceleration in the transactions processed at meager costs compared to regular bank transactions reduces the cost of using the shared economy.

Below is a table that illustrates the main challenges of shared economy applications implemented using traditional technologies (Geng, 2022), as well as possible solutions using blockchain technologies:

Table 1. Challenges in shared economy applications that blockchain can provide solution to

Challenges	Solution with Blockchain Technology
Centralized Control and Vulnerability	Decentralization: Eliminates single points of failure, distributing operations across a peer-to-peer network.
Data Security and Privacy Concerns	Enhanced Security: Utilizes encryption and consensus algorithms to secure data against unauthorized access.
High Transaction Costs	Reduced Costs: Minimizes intermediaries and administrative expenses, lowering transaction fees.
Fraud and Manipulation	Transparency and Immutability: Records are public and cannot be altered, reducing fraud and ensuring integrity.
Lack of Trust Among Parties	Trustless System: Enables transactions without needing trust between parties, using smart contracts for automatic execution upon agreed conditions.
Inefficient Dispute Resolution	Smart Contracts: Automates enforcement and execution of agreements, providing clear dispute resolution mechanisms.
Platform Dependency	Interoperability: Allows for cross-platform interactions and reduces dependency on a single platform's policies and fees.

The decentralized blockchain technology allows society to create its own identity and reputation system that helps promote safety and standards of professional behavior in the shared Economy. The users can leverage cryptography to establish the proof of authority plus the ability to manage it with no ownership of any centralized identity service provider. Edge computing technology is made very secure and private, offering users more authority to control their data. Because the reputation systems on the Blockchain are publicly available, the users openly put each other on the scale and evaluate the articles of cooperation. Unchangeable reputational records are incentives promoting trust because they enable service users to assess the trustworthiness and competence of service providers before the transaction (Mehrwald & et., 2019).

Like a green book, Blockchain ensures the traceability of transactions in the peer (shared Economy), and each transaction cannot be modified and can only be connected to prior ones. A permanent, inviolable, and accountable chain of records manifests transparency and trust, and as a result, fraud and disputes decrease. It facilitates participants to check the data reality of disputable data, ultimately leading to a speedy settlement of disagreements.

4 System proposal of ride-sharing platform

Blockchain technology can put forth a paradigm shift in ridesharing platforms through the ability to establish trust, security, and efficiency in peer-to-peer transactions. The decentralized identity and reputation systems enable passengers to validate the identity and reputation of drivers before heeding rides, making safety issues (Soroková, 2020). The transaction records are transparent and immutable, which provides for safe recording and elimination of tampering and, therefore, preclude the absence of disagreements in pricing and payments. Intelligent, automated contracts aim to smooth payment processing and automatically pay the listed rates the system allows. Removing intermediary costs benefits the drivers and will enable them to earn fair prices while the passengers have cheaper fares.

Below are the entities and activities involved in applying blockchain technology for the mentioned use-case described. Following that, a process diagram is provided.

1. **Users:** There are two main types of users - drivers and passengers.
2. **Registration and Authentication:** Users register on the platform and authenticate through the blockchain, ensuring security and transparency.
3. **Offering a Ride:** Drivers can offer rides, specifying details such as start point, end point, departure time, and price.
4. **Searching for Rides:** Passengers search for available rides based on their criteria.
5. **Booking a Ride:** Once a passenger finds a suitable ride, they can book it.
6. **Payment:** Payments are made using cryptocurrencies via the blockchain, ensuring security and reducing fraud risks.
7. **Rating:** After the ride is completed, both drivers and passengers can rate each other. This rating process is also conducted through the blockchain network for transparency and reliability.
8. **Smart Contract Execution:** Introducing smart contracts to automate payments, penalties, and rewards.
9. **Dynamic Pricing Model:** Implementing a dynamic pricing model based on demand and supply.
10. **Dispute Resolution:** Adding a process for dispute resolution through blockchain arbitration.
11. **Loyalty Rewards:** Integrating a loyalty rewards system for frequent users, managed via blockchain.
12. **Vehicle Tracking:** Incorporating real-time vehicle tracking during the ride.

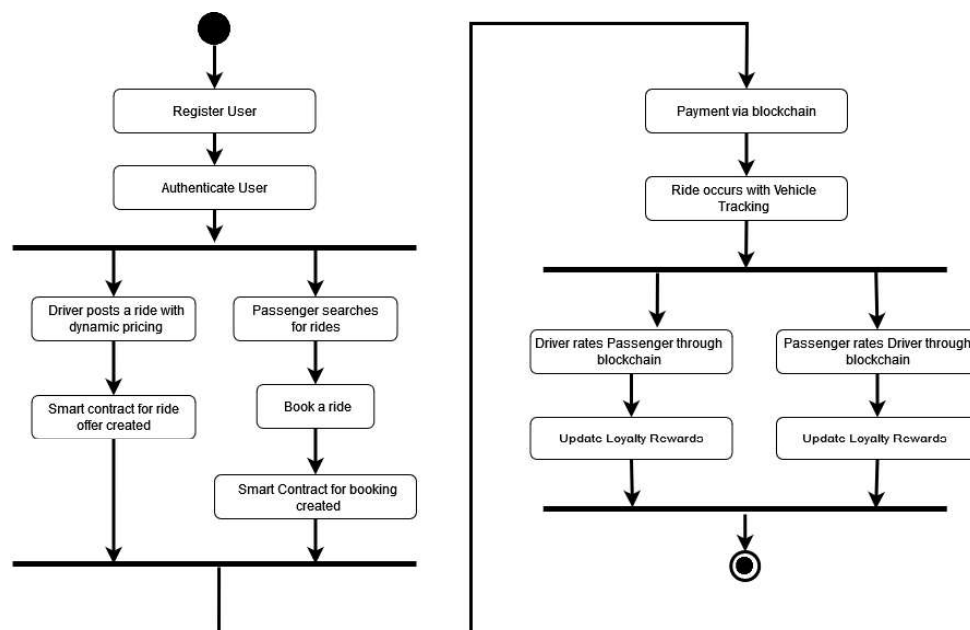


Figure 1 - Blockchain based Ride-sharing platform process diagram (Authors work)

5 Conclusion

The exploration of blockchain technology within the context of shared economy applications offers a solution to the issues of transparency, security, and trust among participants. By leveraging the inherent characteristics of blockchain, such as decentralization, immutability, and cryptographic security, this study illustrates the potential for a transformative shift in how transactions and interactions are conducted within these platforms. The deployment of blockchain can significantly mitigate the challenges associated with traditional systems, enabling a more transparent, secure, and trustworthy environment for all stakeholders (Fiorentino, 2021).

Such a system could contribute to a greater presence of the sharing economy in the real world. Users who are physically distant would be more willing to invest their resources because the reputation of participants is recorded on the blockchain system and easily verifiable.

The ride-sharing application is just one possible example, but it illustrates the benefits of such a system in a simple way. It gives all participants a chance to build up a much more secure, transparent, and ecosystem with minimized costs. The effect of this is to create an infinitely more efficient and user-friendly market for both riders and drivers. The multiplication of Blockchain's capacities leads to unlocking new opportunities, driving innovations, and creating new values for shared economy participants on different levels.

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Serbian Gen Z and the Gig Economy: Unveiling Perceptions and Motivational Factors

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Abstract. *This study investigates the engagement of Serbian Generation Z individuals in the gig economy, focusing on perceptions and motivational factors. Through an examination of existing gig economy platforms in Serbia, as well as a survey conducted among University of Belgrade students, the research explores student participation in the gig economy. Findings reveal that a smaller percentage of surveyed students participate in platform work (only 6.8%) and that females dominate this group. Factors such as financial support for tuition fees are associated with increased participation. Students offering skills via platforms primarily engage in tasks such as online classes and social media management, with average hourly rates of around 16 EUR. The study suggests the need for educational initiatives to raise awareness among young individuals and highlights the importance of further research to generalize findings and understand workforce segmentation within the gig economy.*

Keywords. *Gig economy, platform work, GenZ, platform economy*

1 Introduction

The terms *sharing economy (SE)*, *collaborative consumption*, and *platform economy* are most commonly used to describe the peer-to-peer (P2P) sharing of access to underutilized goods and services, prioritizing utilization and accessibility over ownership (Schor & Fitzmaurice, 2015). They expound the opportunity to transform a business model design and day-to-day decision-making, which has profound implications both as an opportunity and a challenge (Guttentag, 2015). SE is sector-specific: how sharing is done depends on what is being shared. According to Treľová (2021), there are three types of sharing economy: temporary provision of movable or immovable property (like Airbnb), service provision based on property (like Uber) and service provision based on one's knowledge, skills, and abilities (like TaskRabbit).

The domain of the sharing economy that involves non-traditional employment contracts appears under the *gig economy* and *freelancing* concepts. It focuses on specific forms of work on digital platforms associated with online outsourcing and crowdworking. This area of the SE is referred to as human resources or on-demand services. Digital platforms provide a P2P connection between those who possess the necessary knowledge or skills to perform tasks and occasional work and those who require these temporary agreements. In this domain, there are several types of stakeholders, such as service providers (contractors or taskers), users (clients), and intermediaries (platforms that connect them).

The paper is organized as follows: the second section offers an overview of existing gig economy platforms operating worldwide and in Serbia, as well as an exploration of the factors which impact participation in the gig economy. The third section delves into the case study setting, covering the survey and sampling approach. Subsequently, the following chapter presents the results, and the last section encompasses the discussion and concluding remarks.

2 Gig economy platforms

TaskRabbit is a recognizable global representative of gig economy platforms. Founded in 2008 under the name RunMyErrand, the primary idea of this platform was neighbourhood assistance. In 2011, it was rebranded as TaskRabbit and relocated to San Francisco, achieving great success as it was available in 20 countries, with 1.25 million users, 25 thousand taskers, and 37.5 million dollars in venture funding. According to findings from 2015 (Cullen & Farronato, 2021), the average revenue from one transaction was 37 dollars. Earnings could reach up to 7,000 dollars per month. TaskRabbit offered a variety of tasks, such as minor home repairs, painting, furniture assembly, gardening, yard work, grocery shopping, etc. In summary, taskers browse tasks in their city and submit offers, while users post task requests with details. The platform itself states that it does not deal with licensed professionals and professional services and that taskers are not TaskRabbit employees but independent contractors.

In Serbia, two gig platforms stand out: Uradi-zaradi and PetGuards. Based on the American TaskRabbit, Uradi-zaradi was the first gig platform in Serbia, established in 2015. Its primary idea is to connect people who require household cleaning and maintenance assistance with those who want to earn additional income. According to available data, in 2020, the platform had around 5000 users and 150 service providers. The tasks or jobs on Uradi-zaradi are divided into three categories: regular maintenance services for households, cleaning and ironing, and cooking. The most common users are households with children or employed individuals who lack time to perform these tasks. The most common taskers are homemakers, students, and unemployed individuals with more free time than users. The compensation rate was at least 4 Euros per work hour (in 2022). The amount of compensation depends on the volume of work, the required level of cleanliness, the availability of cleaning supplies, special client requests, and other factors.

The PetGuards platform was created to connect pet owners with individuals interested in caring for or walking pets as needed. The platform currently provides pet care services in Belgrade and Novi Sad. Interested candidates fill out the form on the website with basic information about themselves and their experience. As stated on the platform, only 10% of applicants pass the selection. Each accepted caregiver creates a profile and is listed on the website, with data about the type of pets they are responsible for, how long they have been on the platform, available dates for care and other relevant information. Unlike the Uradi-zaradi platform, Petguards typically does not provide information about the compensation rates for caregiving services, previous experiences, or ratings from other users. Users can submit a care request on the website, which includes all relevant information about the pet, duration of care, and the owner.

2.1 Factors impacting participation in the gig economy

This section briefly reviews previous research to elucidate the motivating factors driving user involvement in the gig economy. It synthesizes findings from five distinct studies, highlighting the diverse factors identified across various contexts. It is believed that this section will provide valuable insights into the multifaceted nature of motivations underlying participation in the gig economy.

The study by Bogatyreva et al. (2023) in Russia found that gig and sharing economy workers exhibit notably higher entrepreneurial intentions than the general population. Factors such as age, entrepreneurial social capital, previous entrepreneurial exit, and intrapreneurial experience similarly influence participation in the gig and sharing economies. Additionally, the authors found that engagement with digital platforms is linked to perceived self-efficacy, while experience in the gig and sharing economy positively influences the formation of entrepreneurial intentions.

The second study, which drew our attention, revealed distinct gender-based motivations driving participation in the gig economy, focusing on moonlighters (those holding a second job). Men were primarily motivated by time constraints on their primary job, covering ongoing expenses and saving for the future. In contrast, women were motivated by covering expenses and concerns about the security of their primary jobs. These motivations shed light on the nuanced differences in how men and women engage with gig work (Doucette & Bradford, 2019). The following study, performed in China by Wei and MacDonald (2022), proposed a 'work relationship model' for the gig economy based on three macro-level and twelve micro-level factors. Key findings highlight income, labour protections, voice, and client

behaviour as the most crucial factors influencing both work quality and work relations for gig workers, offering insights into the dynamics within the gig economy.

A study conducted in Malaysia, where the target population were undergraduate students from public universities, shows that students are likely to actively engage in the gig economy, driven by the perception of its usefulness in aligning with their goals, developing relevant skills, balancing academic and professional responsibilities, fostering an entrepreneurial spirit, and gaining financial independence. Their engagement is influenced by their positive impression of the gig economy's potential for financial gain, leading them to actively seek opportunities, sign up for platforms, and pursue gigs for monetary gain and skill development. Moreover, students recognized the gig economy as a pathway to improve employability and gain real-world experience, emphasizing the need for universities to adapt their curricula to prepare students for diverse job opportunities in the evolving gig economy landscape (Mahmud et al., 2023). Another Malaysian study revealed that the socio-economic sustainability of the bottom 40% and the middle 40% income groups in the gig economy is influenced by factors such as circumstances, earnings, risk, prospects, and workload. At the same time, flexibility does not show a significant impact. These factors collectively shape motivations, commitment, work-life balance, financial security, and career aspirations, affecting individuals' engagement and sustainability in gig work. Moreover, there is a notable difference in socio-economic sustainability between the two income groups, potentially influenced by income disparities, access to opportunities, financial stability, skills, networks, and policy environments (Ab Rashid et al., 2023).

3 Case study setting

We collected the perceptions and experiences of Serbia's Gen Z on participation in the gig economy through the survey conducted in May 2023. The survey was administered to University of Belgrade (UB) – Faculty of Organizational Sciences (FOS) students. The FOS is one of the leading institutions within the UB, educating students on information systems and technologies and business at BSc, MSc, and PhD levels (FOS, 2024). The anonymous survey was conducted online using Microsoft Forms. The conducted study was cross-sectional, which is an observational study designed to collect data from participants at a single point in time, providing a snapshot of a population's characteristics and variables of interest (Wang & Cheng, 2020). The questionnaire itself consisted of several segments. The first segment aimed to capture basic socio-demographic information on the respondents, such as gender, age, region of origin, amount of money at personal disposal at the monthly level, type of accommodation they live in, and similar. The next and final part was related to their participation in the gig economy and reasons for participation or absence. Questions used in the survey were modified from previous studies in the field of the sharing economy (Hamari et al., 2016; Yuan et al., 2021).

4 Results

We collected the responses of 325 students, 99 (30.5%) males and 226 (69.5%) females. A slight disproportion in gender can be detected, but that could have been expected, with a higher percentage of females enrolled in higher education at the UB in mind (University of Belgrade, 2016). Results show that most respondents grew up in Belgrade (37.5%) and cities of medium size, between 20,000 and 100,000 inhabitants (32.2%). Looking at the region of Serbia where the respondents grew up, most are from Belgrade and surrounding cities (42.8%) and West Serbia (15.4%). Slightly more than half of the respondents live with parents (52.9%) in a house or apartment the family owns (59.7%). Regarding the financial situation, most students have up to 150 EUR at their disposal, and 74.8% of students have their tuition fees covered by the Republic of Serbia.

Out of 305 respondents, only 22 (6.8%) offer their skills via the platform, while the remaining 93.2% do not. Since the two groups, those participating in the gig economy and those who do not, are pretty unequal, comparing the two groups is not advised, even with nonparametric tests. Therefore, the two groups will be observed more closely using descriptive statistics. Looking at the gender of those offering skills via online platforms, females are dominant (63.6%). Most of the students grew up in a city of medium size, with between 20,000 and 100,000 inhabitants (40.9%) and an amount between 150 EUR and 350 EUR (31.8%) at their disposal. Interestingly, almost 78% (77.3%) of the respondents who offer

their skills are students whose tuition fee is covered by the budget of the Republic of Serbia. This indicates that students with good grades and academic achievements are those sharing their skills and knowledge. Looking at how much they charge for 1 hour of online work, the mean amount is 16 EUR, with a standard deviation of 6.2 EUR. The highest requested amount is 25 EUR, while the minimum is 5 EUR. The mean number of hours per week the individuals are ready to work via the platform is 10.5, with a standard deviation of 10.1 hours. In the next stage, the students were asked which skill they offered via online platforms. The question was multiple choice, as students can provide different skills, especially digital ones. The most commonly shared skill was giving online classes (English, programming, mathematics), followed by social media management, marketing plan development, translation and text formatting, and web design.

Besides analyzing those who offer their skills on platforms, we more closely observed those who do not. If they participated in such a form of sharing, we wanted to know which skills they would consider sharing, at what price, and for how many hours a week. Looking at how much they would charge for 1 hour of online work, the mean amount is 16 EUR, with a standard deviation of 9.8 EUR. The highest requested amount is 65 EUR, while the minimum is 5 EUR. The mean number of hours per week the individuals were ready to work via the platform is 12, with a standard deviation of 10.13 hours. In the next stage, the students were asked which skill they would consider offering via online platforms. Most respondents from this group, 120, are not interested in providing their skills via platforms. On the other hand, looking at the skills they would offer, they are most interested in doing social media management (33.3% of answers), marketing plan development (32.0%), giving classes (31.4%), programming (20.1%), and babysitting (20.1%).

5 Discussion and conclusion

The study presented above aimed to observe young individuals' participation level in the Republic of Serbia's developing gig economy market. The study results indicate that currently, only 6.8% of the surveyed students offered their skills via the platform. Females dominate among students offering skills via online platforms (63.6%). About 78% are students whose tuition fees are covered by the budget of the Republic of Serbia, indicating that better students share their skills and knowledge more frequently. They are ready to work around 10.5 hours per week. On average, students charge 16 EUR per 1 hour of work, with the highest requested amount of 25 EUR and the minimal 5 EUR. Interestingly, the group of students who do not share their skills on the platform would highestly charge 65 EUR per hour of work. This shows that even if, on average, they would charge the same as students who already offer their skills (16 EUR), some of these students have unrealistically high expectations. Some policy and managerial implications of the study can be made. The results of our study show that students and young people in Serbia generally are not that acquainted with the concept of platform work. Therefore, a suggestion to stakeholders is to organize workshops, seminars, and presentations on the idea at universities, faculties, and youth gatherings. It is believed that such short presentations, education, and talks with those participating in platform work could also motivate others to participate. Also, platforms should support these events to provide more information on their security and privacy actions to protect providers and users. The results of this study should be interpreted in light of its limitations, the first of which is the sample. With the presented survey, we covered only students from one faculty at one university in Serbia. Therefore, to obtain more generalizable results, a large-scale survey is needed. However, the results of this study could act as valuable input for further studies on the topic. One of them could be segmenting workforce providers, which would provide an in-depth analysis of their behaviour patterns. Similar studies have been conducted in shared accommodation (Maricic et al., 2023) and carpooling (Salamanis et al., 2019).

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Airbnb in Academic Focus: A Bibliometric Analysis of Research Trends and Author Productivity

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Abstract. *This paper presents a comprehensive bibliometric analysis of the academic discourse surrounding Airbnb, a leading figure in the sharing economy, focusing on author productivity and the evolution of research themes from 2010 to 2023. Utilizing data extracted from the Web of Science platform, we systematically review 2,023 scholarly articles to map out the trajectory of Airbnb research. Our findings reveal a noticeable growth in publications, reflecting Airbnb's expanding influence on global accommodation practices, local communities, and the broader hospitality industry. The analysis highlights key areas of scholarly interest, including Airbnb's disruptive innovation, its economic and social impacts, and the crucial role of trust and reputation in peer-to-peer transactions. This paper not only chronicles the rise of Airbnb within academic literature but also underscores the multidisciplinary interest it has sparked, paving the way for future research into its continuing evolution and broader implications within the sharing economy.*

Keywords. *airbnb, sharing economy, bibliometric analysis, shared accommodation*

1 Introduction

The swift advancement of information technologies and a growing global base of internet-users have spurred the sharing economy's growth, changing how goods and services are consumed worldwide. This shift, fueled by technological innovations and changes in consumer behavior since the 2008 Global Economic Crisis, emphasizes more economical, ethical, and sustainable consumption choices. Notable manifestations of this shift are platforms like Airbnb and Uber, which epitomize the preference among consumers for temporary access over outright ownership of goods (Hassanli et al., 2022). Airbnb, in particular, stands as an example of the sharing economy's ethos, offering a straightforward platform for sharing living spaces. The business model of Airbnb facilitates a mutually beneficial exchange between accommodation providers and seekers, primarily tourists, allowing the former to monetize unused spaces while offering the latter quality services at competitive (Andreu et al., 2020; Sun et al., 2024). The success of Airbnb lies in its ability to efficiently match supply with demand through a collaborative user platform. It boasts a diverse range of accommodations, from urban apartments and rooms to more unconventional options like treehouses and igloos, demonstrating the versatility and reach of the sharing economy (Dann et al., 2019).

Airbnb, a platform harnessed from the forefront of modern internet technologies, has been dubbed a "disruptive innovation" by Guttentag (2015). This peer-to-peer accommodation service goes beyond mere cost savings, offering a suite of benefits that include access to apartment amenities and the promise of an authentic local experience. As an online marketplace, Airbnb empowers homeowners to lease their spaces to visitors for brief durations, fostering a unique blend of hospitality and community. The platform saw its most significant expansion in 2008, coinciding with Airbnb's inaugural year, marking a pivotal moment in urban lodging across the globe (Faye, 2024). Furthermore, Airbnb's evolution has effectively transformed homeowners into micro-entrepreneurs, redefining traditional concepts of property rental and guest accommodation (D. Guttentag, 2019).

Numerous studies on Airbnb have explored a variety of key themes, including its role as a disruptive innovation (Guttentag, 2015; Guttentag & Smith, 2017), its impact on the hotel industry, and its effects on local communities (Li et al., 2019; Zervas et al., 2017). Moreover, investigations have delved into the dynamics of trust in hosts and the overall reputation of the platform (Andreu et al., 2020).

Many researchers addressed the topic of the Airbnb platform in the literature. Some of them are focused on finding research gaps and giving suggestions for the future research (D. Guttentag, 2019). Others investigated research methods, concluding that majority of work is based on surveys and empirical data, while experiments are scarce (Dann et al., 2019). Medina-Hernandez et al. (2020) highlight the scarcity of research on peer-to-peer accommodation platforms beyond Airbnb. This research paper focuses on bibliometric analysis of the literature surrounding Airbnb, examining author productivity within this field of study.

Following an introduction to Airbnb and the broader concept of the sharing economy, the paper is organized as follows. The methodology which was used in examining Airbnb is presented in section 2. A bibliometric analysis of Airbnb in literature is provided in section 3. Finally, section 4 presents conclusions and visions for future research.

2 Methodology

Data is collected from the Web of Science (WoS) platform (Clarivate Analytics, 2023), using the following search configuration:

(TS = (airbnb))

Indexes = Web of Science Core Collection

Timespan = All years

The initial dataset contained information on 2,085 papers. The time frame for the analysis was the period 2010-2023, therefore, papers written out of the defined period were removed, leaving 2,023 papers. Data contains information such as authors, titles, source titles, publication year, keywords, categories, times cited.

Data is analyzed using python packages pandas, collections, and matplotlib and aggregated results are presented.

3 Results of the Bibliometric Analysis

Bibliometric analysis geared towards a review of literature productivity and an observation of the trends in writing about Airbnb is presented in this section of the paper.

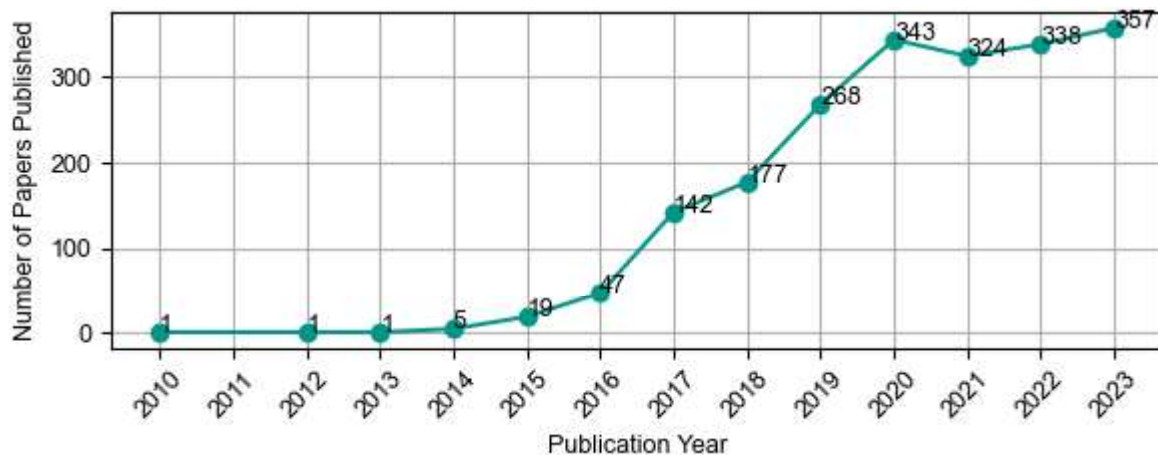


Figure 1. Number of papers with Airbnb in topic published per year (Source: Authors' work)

Figure 1 illustrates the annual trend in the number of papers published on the topic of Airbnb. The graph begins with a single paper in 2010. From 2010 to 2013, the number remains low, with 1 or fewer papers published each year. In 2014, there is a noticeable increase to 19 papers, and the trend continues to grow significantly in the following years, reaching a peak of 343 papers in 2020. Post-2020, the trend shows a slight variation but generally levels off, with a small decrease to 324 papers in 2021, a minor increase to 338 in 2022, and a final count of 357 papers in 2023.

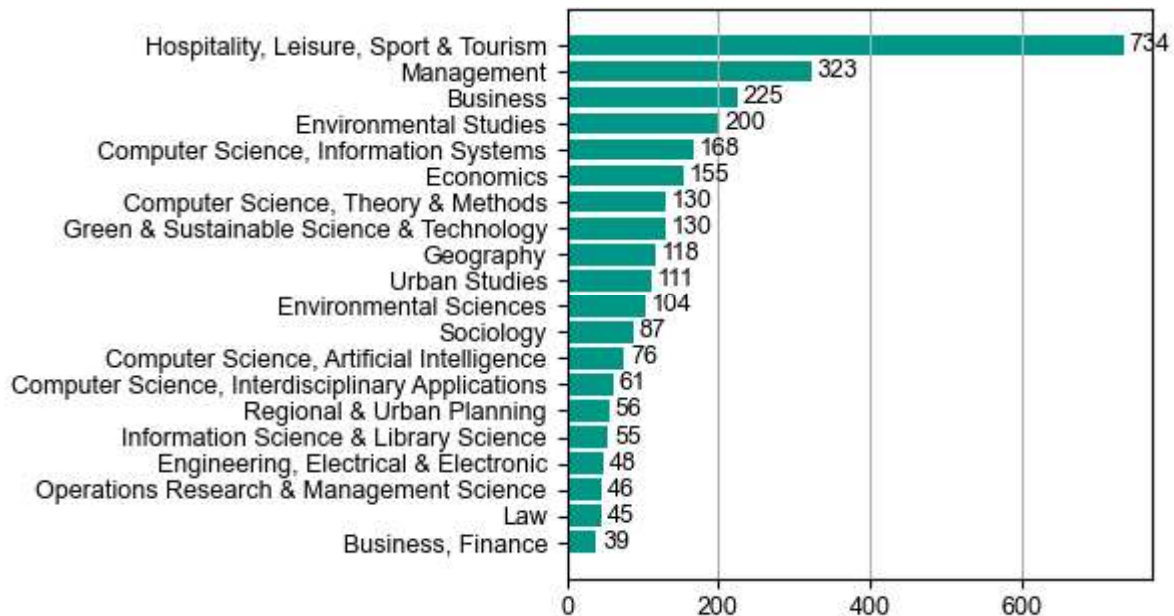


Figure 2. Most popular WoS categories for papers with Airbnb in topic (Source: Authors' work)

Figure 2 displays the distribution of research areas in scientific papers related to Airbnb, ranked by the frequency of their occurrence. The field of “Hospitality, Leisure, Sport & Tourism” leads with 734 papers, reflecting its primary relevance to the service that Airbnb offers. “Management” and “Business” are also highly represented with 323 and 225 papers respectively, indicating a strong focus on the business and management aspects of Airbnb. The domain of “Environmental Studies” follows with 200 papers, while “Computer Science, Information Systems” shows a significant contribution with 168 papers, suggesting interdisciplinary research involving technology's role in Airbnb's services. This chart highlights the diversity of academic disciplines engaged in the study of Airbnb and its multifaceted effects on various aspects of society and industry.

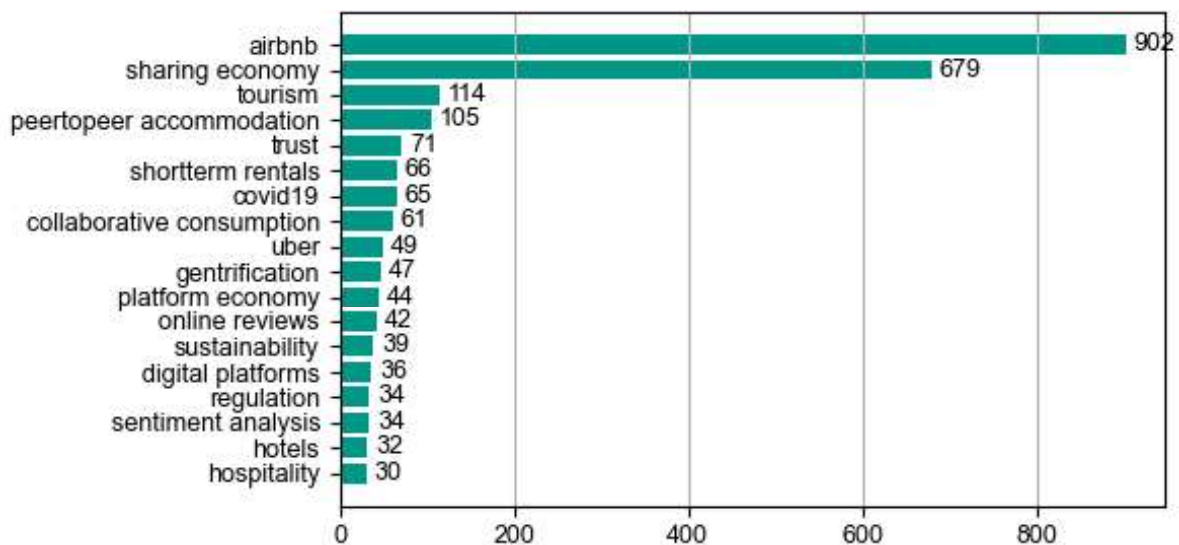


Figure 3. Most popular author keywords in papers with Airbnb in topic (Source: Authors' work)

Figure 3 provides an overview of the frequency of keywords used in scientific papers that discuss Airbnb. The keyword “airbnb” itself tops the chart with 902 occurrences, underscoring its centrality to the research. It's followed by “sharing economy”, which is mentioned 679 times, reflecting a significant focus on the broader economic phenomenon encompassing Airbnb. The keyword “tourism” appears in 114 papers, highlighting the impact of Airbnb on the tourism industry. “Peer-to-peer accommodation” is identified in 105 papers, indicating a strong research interest in the fundamental business model of Airbnb. Other notable keywords include “trust” with 71 mentions, “short-term rentals” with 66, and “COVID-19” with 65, pointing to research into the trustworthiness of peer-to-peer transactions, the nature of Airbnb's offerings, and the impact of the pandemic on such services, respectively. The chart continues with a range of other relevant keywords, including “collaborative consumption”, “uber”, and “gentrification”, each with fewer than 50 mentions, but still significant enough to demonstrate a variety of research interests in the context of Airbnb's operation and influence. This visual representation emphasizes the diversity and scope of research themes related to Airbnb within the academic literature.

Table 1: Journals with most papers containing Airbnb in topic (Source: Authors' work)

Journal	Number of papers
INTERNATIONAL JOURNAL OF HOSPITALITY MANAGEMENT	96
SUSTAINABILITY	75
CURRENT ISSUES IN TOURISM	68
INTERNATIONAL JOURNAL OF CONTEMPORARY HOSPITALITY MANAGEMENT	68
ANNALS OF TOURISM RESEARCH	47
TOURISM MANAGEMENT	43
TOURISM ECONOMICS	29
JOURNAL OF SUSTAINABLE TOURISM	25
JOURNAL OF HOSPITALITY AND TOURISM MANAGEMENT	23
INTERNATIONAL JOURNAL OF CULTURE TOURISM AND HOSPITALITY RESEARCH	21
JOURNAL OF BUSINESS RESEARCH	21
INTERNATIONAL JOURNAL OF TOURISM CITIES	20
JOURNAL OF TRAVEL RESEARCH	19
JOURNAL OF TRAVEL & TOURISM MARKETING	17
TOURISM GEOGRAPHIES	16
TOURISM MANAGEMENT PERSPECTIVES	15

Number of papers on Airbnb-related topics published in different journals is presented in Table 1. Leading the chart is the International Journal of Hospitality Management with 96 publications, indicating a primary interest in Airbnb's influence on hospitality management. The Sustainability journal follows with 75 papers, suggesting a significant focus on the sustainability aspects of Airbnb. Current Issues in Tourism and the International Journal of Contemporary Hospitality Management are tied, each featuring 68 papers. The distribution presented in the chart reveals the multi-disciplinary interest in Airbnb, with a clear emphasis on its impact within the fields of hospitality and tourism research.

4 Conclusion

The bibliometric analysis conducted in this paper has shed light on the significant academic interest in Airbnb and its pivotal role within the sharing economy. The methodology employed, utilizing data from the Web of Science platform, allowed for a comprehensive review of author productivity and research advancements concerning Airbnb, from its inception in 2008 to the present day.

The trends observed through this analysis, including the exponential increase in publications since Airbnb's launch, underscore the platform's importance and the wide-ranging implications of its business model. The diversity of research areas, from hospitality and tourism to environmental studies and

information systems, highlights the interdisciplinary interest in Airbnb and reflects its multifaceted impact on society.

As we look towards the future, it is clear that Airbnb will continue to be a subject of keen academic interest. Areas such as the ongoing evolution of the sharing economy, the regulatory challenges faced by Airbnb and similar platforms, and the long-term effects of these services on global travel and local economies promise rich avenues for further research. Additionally, emerging trends such as the impact of global crises, including the COVID-19 pandemic, on the sharing economy will undoubtedly shape future scholarly inquiries.

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Enhancing Trust and Security in Peer-to-Peer Transactions through Blockchain Technology: A Comprehensive Exploration

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Abstract. *In today's digital landscape, peer-to-peer (P2P) transactions have gained significant traction across various sectors, ranging from travel necessities to energy sharing. However, the inherent challenges of trust and security have remained formidable obstacles to widespread adoption. This paper presents a comprehensive exploration of how blockchain technology can address these challenges and enhance trust and security in P2P transactions. By providing a decentralized and immutable ledger, blockchain offers a transparent and tamper-resistant platform for recording transactions. Through a review of existing literature, this paper analyses the potential benefits of blockchain in P2P transactions. It examines various consensus mechanisms, smart contract implementations and privacy-preserving techniques to evaluate their effectiveness in ensuring trust and security. By synthesizing insights from both theoretical frameworks and practical implementations, this paper offers valuable guidance for researchers, practitioners and policymakers seeking to leverage blockchain technology to enhance trust and security in P2P transactions.*

Keywords. *Sharing economy, blockchain technology, peer-to-peer transactions, trust, security*

1 Introduction

A sharing economy (SE) is defined as a system, often mediated by online platforms, that enables access to underutilized physical assets in a short period (Petruzzi et al., 2021). The latest concept of SE, caused by the digitization of all spheres of life, reflects changes technically and technologically in production and consumption (Lyaskovskaya & Khudyakova, 2021). While definitions may differ, the essence of the SE revolves around acquiring resource access rather than ownership (Markman et al., 2021). This involves facilitated exchanges through digital platforms and a community-driven dimension, grounded in the establishment of novel social bonds and shared goals (Baumber et al., 2019).

Moreover, blockchain (BC) is a distributed ledger of electronic transactions (Golosova & Romanovs, 2018; Guo & Yu, 2022). The first indications of the BC solution definition date back to the late 80s and early 90s of the last century (Palop Gisbert, 2022). Work (Diffie & Hellman, 1976) focuses on the use of the concept of a distributed ledger. However, the most known work in this field was written by an author (or group of authors) with the pseudonym Satoshi Nakamoto (Yaga, et al., 2018; Monrat et al., 2019; Rajasekaran et al., 2022) titled "Bitcoin: A Peer-To-Peer Electronic Money System," marking a turning point in BC and cryptocurrency evolution, particularly Bitcoin, which emerged in 2009 and currently holds a value of around \$60,000 (CoinMarketCap, 2024).

This paper covers both the theoretical background of the SE and BC and related work on the application of BC systems to address the shortcomings of the SE, which is the ultimate goal of this research. After reviewing the relevant literature and related work, the main part of the paper provides an excerpted table of existing and active companies and platforms implementing BC in the field of SE. Ultimately, the conclusion outlines the next steps in researching the given topic.

2 Theoretical Background

2.1 Definition and Origins of the Sharing Economy

SE represents one of the fastest-growing business models today. However, the philosophy underpinning the SE, which posits that access to resources and assets will become more significant than ownership itself, is far from being a novel concept (Sainaghi et al., 2019). In comparison to the business aspect and the increasing interest in engaging in the SE, the SE remains relatively contemporary from an academic viewpoint (Agarwal & Steinmetz, 2019). The term SE is often associated with the pioneering work of Marcos Fairson, a sociology professor at Texas State University and Joan Spans, a sociology professor at the University of Illinois, who introduced it in 1978 (Zhu & Liu, 2020). The emergence of the Internet and digital technologies in economic transactions has facilitated a more comprehensive unveiling and interpretation of this concept (Lyaskovskaya & Khudyakova, 2021). The historical evolution of the SE term arises from retrospective analysis and research studies specifically focused on SE. The development of the SE has been categorized into three distinct stages, as identified by Lyaskovskaya & Khudyakova (2021). The initial stage is defined by the introduction of the term collaborative consumption (SE) and is associated with the 20th century (Lyaskovskaya & Khudyakova, 2021). Identified as the origin phase, the second stage covers the period from 2002 to 2015, during which researchers examined, gathered and synthesized new findings concerning economic practices in collaborative consumption, establishing the foundational principles in terminology, theory and methodology, thereby giving rise to the SE concept as a distinct entity (Lyaskovskaya & Khudyakova, 2021). It is widely recognized that from 2016 onward, the third phase denotes a period of extensive development for SE as an emerging business model in the digital economy, intertwined with sustainable consumption (Lyaskovskaya & Khudyakova, 2021).

As previously emphasized, with the progression of science and technology, as well as the popularity of online payments, numerous categories of products and services that can be shared have emerged in the market, making the SE an omnipresent trend in people's lives (Jiajing, 2023). In this regard, (Baumber et al., 2019) highlight that SE pertains to characteristic activities that can be categorized into four broad tiers: goods recirculation, increased utilization of durable assets, service exchange and sharing of productive resources. According to (Markman et al., 2021), sharing platforms are typified by the following traits: (1) enabling peer-to-peer transactions, wherein participants are private individuals rather than businesses or professionals; (2) supporting offline interactions among users; (3) focusing on the utilization of underutilized capacities like physical assets, resources, skills, or time, and (4) highlighting temporary access over ownership. It could be posited that the integration of the preceding insights on the SE has given rise to a redefined SE, evolving from its original bilateral transaction framework to today's three-way transaction structure, characterized by communal sharing on the platform (Zhu & Liu, 2020). As illustrated in Figure 1, a third-party platform holds a pivotal role, with shared information being present on the platform. Seekers offer the resources to acquire shared items. Throughout this procedure, the platform levies a portion of the fee for its services, as adjusted per (Zhu & Liu, 2020).

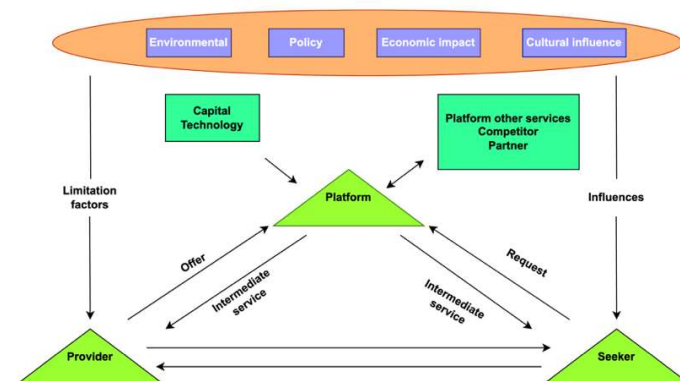


Figure 1. Overview of the Sharing Economy (Source: Zhu & Liu, 2020)

2.2 Definition and Infrastructure of the Blockchain

BC, as the name implies, is a chain of blocks, each carrying transactions or other information. While the contents of blocks can vary, they usually consist of the following: a block header containing the block number, hash of the previous block header, hash of the block data, timestamp, block size, nonce (a cryptographic nonce is an arbitrary number used only once), and block data containing other data and a list of transactions and ledger events included in the block (Yaga et al., 2018). Blocks are cryptographically linked, meaning each new block in the chain contains a cryptographic hash of the preceding one, generated automatically and cannot be altered. The more blocks in the chain, the more "resilient" the chain is (Golosoza & Romanovs, 2018). Similarly, if there is a shift in any block, the entire chain will be "infected" (Khatri et al., 2021). The architecture of BC consists of applications, a decentralized ledger and a peer-to-peer network (Yaga et al., 2018). As (Yaga et al., 2018) state, the first level refers to all user-interface applications, usually wallets, whether they are web, mobile, or hardware, through which end users can execute and track their transactions. The middle level belongs to the decentralized ledger, enabling the grouping of transactions into sections that are linked to each other cryptographically (Miraz & Ali, 2018). According to Ammous (2016), mining is the process of organizing transactions into blocks and adding them to the end of the current BC. Nodes carry out different tasks based on their position within the BC network. When a node proposes, approves and mines transactions to create consensus for the BC's security, it is referred to as a miner (Yaga et al., 2018). Proof-of-work, as (Monrat et al., 2019) describe, provides security and agreement within the BC network by verifying blocks through a hash function and a nonce. However, (Sarmah, 2018) points out that its reliance on miners' incentives can lead to scalability and security concerns. Alternatively, proof-of-stake offers a more efficient solution by assigning consensus updating responsibilities based on participants' stakes, thus reducing the risk of unwanted BC forks (Sarmah, 2018). Smart contracts, first developed by Nick Szabo in the mid-1990s, verify the delivery of products and services by suppliers during transaction processes between two parties (Guustaaf et al., 2021).

3 Conducted Research

The central theme explored in this paper is how to acknowledge how leveraging the benefits of BC can mitigate the drawbacks of the SE. In this part, the shortcomings of the SE will be outlined first, followed by the advantages of BC technology. Then, concrete examples of how BC technology has been applied in the SE domain will be presented in the form of a table.

Although the SE has gained widespread popularity with a tendency for further growth, due to its innovative approach to resource utilization and community engagement (Hossain, 2020), like any concept, authors have observed and considered various drawbacks in the SE. The most commonly observed drawbacks are associated with trust and security (Wang et al., 2021; Jiajing, 2023). Given that individuals engage in mutual exchanges facilitated by digital platforms today, they must have a significant level of trust in both the platform itself and all participants (Köbis et al., 2021). There's also a lack of transparency about the quality of goods and services, leading to potential dissatisfaction (Jing & Sun, 2018). According to (Buhalis et al., 2020) SE platforms often face challenges with regulatory compliance, given the global and decentralized nature of their services. Furthermore, current SE platforms often charge high fees for their intermediary role, reducing earnings for service providers and increasing consumer costs (Hossain, 2020). In the end, the SE is susceptible to fraud, including fake listings and payment fraud (Mosaad et al., 2023).

According to (Budhi, 2022), immutability ensures that data on the chain cannot be modified or deleted, transparency fosters trust among network participants, censorship resistance indicates the absence of a third-party making decisions and taking actions without oversight and traceability enables tracking of changes, all of which are advantages of BC technology. This is also acknowledged by (Sarmah, 2018), who adds that BC's peer-to-peer systems aid in identifying fraudulent activities within the network and achieving distributed consensus. Moreover, BCs can continue to operate even if some nodes aren't online or under attacks of some kind (e.g. security) and numerous copies of data stored in the BC allow users to desist centralized storage of sensitive information (Sarmah, 2018).

BC technology has been widely utilized in various aspects of the SE, enhancing various services. Certainly, ridesharing has recently drawn the attention of academia (Golubović et al., 2023).

Furthermore, BC can be applied in ridesharing systems, by improving traceability, transparency and automation (Vazquez & Landa-Silva, 2021; Chang et al., 2022). Additionally, it has been proposed as a governance tool for co-working spaces, bolstering traceability and transparency (Fiorentino & Bartolucci, 2021). Furthermore, its influence on trust dynamics within the platform economy has been noted, where confidence in BC technology and its user community impacts rental intentions (Dann et al., 2020). Lastly, it has been seamlessly integrated into a protected ride-sharing decentralized applications (DApps) applying smart contracts on the Ethereum BC (Renu & Banik, 2021). An excerpt from the research results is presented in Table 1 due to the paper's length limitation.

Table 1. BC solutions in the SE domain (Source: Authors' work excerpted from the full table)

Type of SE	Short Description	Technology	Reference
Travel Necessities	Winding Tree is an open-source software family aimed at fostering innovation in the travel industry. Its flagship product, the Winding Tree Market Protocol, connects travel suppliers and buyers through BC technology, facilitating secure and transparent transactions while cutting costs by eliminating intermediaries.	Protocol Smart Contracts - Polygon zkEVM	Winding Tree (2024)
Cloud Storage	Storj, founded in 2014, is a decentralized platform for sharing cloud storage, offering users a reduction in costs by up to 80%.	Golang; STORJ Token	Storj (2024)
Labour Services	ChronoBank operates as a decentralized labour exchange platform built on BC technology. This platform enables direct hiring of freelancers and temporary workers by employers. The employment contracts are executed through smart contracts, ensuring both security and transparency. Additionally, the platform facilitates cryptocurrency payments.	Ethereum and Smart Contracts	ChronoBank (2024)
Energy Sharing	Power Ledger is a platform that facilitates peer-to-peer energy trading within microgrids. Through this platform, individuals have the ability to engage in the buying, selling and trading of renewable energy, sourced from solar panels or other means, directly with nearby residents. By leveraging BC technology, it guarantees transparent and secure transactions, along with precise monitoring of energy consumption.	Smart Contracts and a dual-token system (POWR and Sparkz)	Power Ledger (2024)

4 Conclusion and Future Directions

The objective of this research paper was to apply the benefits of BC to the shortcomings of the SE. After reviewing the literature and mapping the stated advantages and disadvantages, research on related work in this field followed, which confirmed the author's idea of addressing the drawbacks of SE through the application of BC systems. To support theory with practice, the provided table of active companies/platforms offers an overview across various spheres of the SE and the technologies used in their implementation. It is concluded that the authors' idea is realistic as there are attempts at model development in the literature as well as still working companies with real BC solutions. As a next step, it is possible to further explore both the literature databases and other companies. However, authors could also design a model that would track the success factors of developed models and companies/platforms.

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Unveiling Crucial Factors Shaping Ridesharing Usage Intention: Insights from Serbia

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Abstract. *The aim of our paper is to reveal crucial factors related to the intention towards adoption of ridesharing service. To determine the importance of the factors we employ machine learning technique. Employing a survey methodology and a total of 325 questions, we gathered data from students at the University of Belgrade – Faculty of Organizational Sciences. We then analysed responses using a Random Forest Classifier to predict ridesharing service usage intention. Our findings reveal that social influences, including word-of-mouth and perceived enjoyment, are paramount in shaping intentions to use ridesharing services. Negative perceptions about the complexity and safety of ridesharing also emerged as influential. Since our research was focused on first-time users of ridesharing concept the findings can be of great importance for the emerging sharing mobility providers. Outlined top preferences can dictate market operators' penetration strategies that should be adjusted based on the potential consumers' perceptions and motives.*

Keywords. *carpooling, experimental study, machine learning, potential user motives, sharing economy*

1 Introduction

Along with tourism, transport is the sector on which the sharing economy has the greatest impact. Various models within the 'shared/sharing mobility' or 'collaborative mobility' sphere have emerged in the transportation sector. These models range from car sharing to ridesharing, with the latter focused on optimising vehicle capacity by increasing occupancy. While ridesharing can occur organically, there is a rising need for technological platforms to connect drivers and passengers, particularly in the context of pre-arranged carpooling, which we examine in this study.

Our paper aims to elucidate the crucial factors that play a role in individuals' intention to adopt ridesharing service, and determine the most significant ones. To determine the importance of the factors we employ machine learning technique. Employing a survey methodology and a total of 325 questions, we gathered data from students at the University of Belgrade – Faculty of Organizational Sciences.

The paper is organised as follows. After we review recent research aimed at determining the key factors of participation in the ridesharing concept, we explain methodology and present the results of our experimental study. We complete the paper with implications and perspectives of our future research.

2 Influential Factors of Ridesharing Adoption

There is a significant body of research focusing on the influences that are essential for the utilisation of ridesharing service. The studies typically highlight recurring factors, which can be classified in different ways. For example, Neoh et al. (2020) categorised carpooling factors based on whether they are internal or external to the commuter. While the internal aspects manifest at the individual level of each commuter

(i.e., socio-demographic and psychological factors), external factors include everything that surrounds the commuter (i.e., third party interventions and situational factors). Similar report of factors influencing the decision-making of an individual on use of ridesharing was outlined in the study of Malichova et al. (2020). The group of authors highlighted the considerable importance of finding enjoyment in travel time for ridesharing adoption, especially for commuting trips. Additionally, economic benefits and social enjoyment were underlined as major stimulators for ridesharing adoption. Wu & Neill (2021) discovered that both cognitive and affective trust in service provider (i.e., driver) positively impact users' intention to utilize ridesharing platform. Their findings further revealed that platform reputation and security assurance, along with online interaction among potential participants, positively influence the trust components considered in the study.

Research done by Wand and associates (2020) revealed that the consumers' personal innovativeness, environmental awareness as well as perceived usefulness are positively related to intention to use ridesharing services. Cheah et al. (2022) also confirmed that perceived usefulness as well as word-of-mouth positively influence consumers' attitudes towards ridesharing. Akbari et al. (2021) found out that intention to use ridesharing services is predicted by perceived usefulness, user satisfaction, the effect of social pressure – subjective norms, and price value. According to this study, the most notable impact observed was the influence of consumer satisfaction on the intention to use ridesharing services. In their empirical study, Si et al. (2022) also detected crucial factors influencing the continuance intention of using ridesharing service. These are satisfaction, perceived usefulness, economic benefits, and environmental awareness. Also, platform incentives play a significant role.

3 Methodology

3.1 Survey design

In addition to socio-demographic questions and questions related to previous experience with ridesharing concept, our questionnaire consisted of the factors adapted from prior research, with adjustments made to align with the research context. The research model (Figure 1) includes these constructs: perceived risks (PER), perceived economic benefits (PEB), social reputation (SRE), perceived enjoyment (PEN), perceived social (PSO) and media (PME) influence as well as the influence of electronic Word-Of-Mouth (eWOM). Each outlined construct is described by a group of measurement items and measured by 5-point Likert scale covering options ranging from „strongly disagree“ to „strongly agree“.

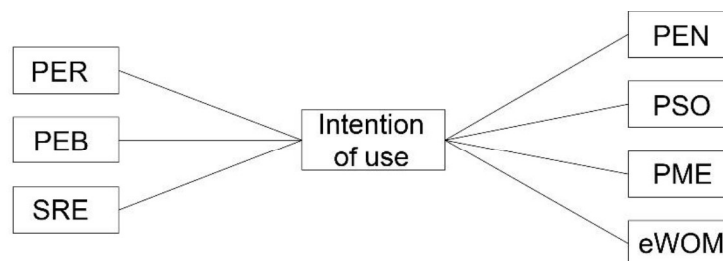


Figure 1. The research model framework (Source: Authors' work)

Perceived risks are related to the negative impacts that potential users of ridesharing concept may be exposed to. Studies suggest that ridesharing poses a wide spectrum of threats for its users, including physical, privacy, financial and service performance risks (e.g. service quality). Perceived economic benefits address the improvements of the economic status of the potential user of ridesharing concept. Perceived sustainability of the ridesharing involves users' perceptions of the various environmental benefits associated with the considered sustainable transportation option. The remaining constructs capture the various social impacts that the ridesharing concept has on potential consumers. Social reputation refers to attitudes about social acceptability and social status that a potential user of ridesharing can have. Perceived enjoyment is related to different social activities resulting in meeting new people, engaging in conversation, having fun during the shared ride, etc. This component also contains negative enjoyment connotation of ridesharing meaning that can be complicated and demanding, pointless or boring for potential users. Social, media and eWOM influence is reflected in

both direct and indirect interactions with different sources (friends, family, social platforms, online reviews and ratings, etc.) and their experiences of utilizing the concept.

3.2 Data collection

Our sample consisted of students from University of Belgrade – Faculty of Organizational Sciences. The anonymous survey was organised in May 2023. Questionnaire was distributed through the Microsoft Forms service, while the data were analysed using SPSS 28 software. A total of 558 students participated in the research, but only 449 were included as a valid for further data analysis. The demographic information of respondents is presented in Table 1. The majority of respondents are between 21 and 22 years old (with median 21) indicating that students belong to generation Z.

Table 1. Respondents' demographic information (Source: Authors' work)

Description variable	Classification	Frequency (449)	Percentage (%)
Gender	Male	129	28.7
	Female	296	65.9
	No answer	24	5.4
Monthly amount at disposal	< 20.000 RSD	156	34.8
	20.000 - 40.000 RSD	126	28.1
	> 40.000 RSD	53	11.8
	No answer	114	25.3
Household type	Live with parents	226	50.3
	Live alone	63	14
	Live with roommate	136	30.3
	No answer	24	5.3
Accommodation type	House in private property	255	56.8
	Rented apartment	101	22.5
	Dormitory	69	15.3
	No answer	24	5.3
Grown	Small city	82	18.3
	A mid-sized city	125	27.8
	Big city	49	10.9
	The largest city (over million people)	169	37.6
	No answer	24	5.3

3.3 Data analysis

The dataset contains 299 entries – individuals who have never used ridesharing service for their travel. Each entry includes a variety of variables (49 in total) pertaining to individual perceptions associated with ridesharing service. Target variable is binary and presents the intention to use ridesharing service in the future.

Preliminary data analysis and classification are done using Python with packages pandas, sklearn, and numpy. The primary objective is to leverage a classification algorithm to predict an intention to use ridesharing service based on individual responses. The data is split into training (80%) and test (20%) sets, adhering to conventional practices for machine learning model validation. A Random Forest Classifier (Ho, 1995), chosen for its robustness and ability to handle complex interactions between variables, was trained with 1000 estimators, with default hyperparameters from sklearn package. Model performance was evaluated using accuracy as the primary metric, supplemented by an analysis of the out-of-bag (OOB) score for an unbiased estimate of generalization accuracy.

4 Results

The Random Forest Classifier demonstrated a noteworthy accuracy level, indicating its effectiveness in predicting the target variable from the given variables on held-out test set, based on 5-fold cross-validation. The average accuracy of 0.78 is a critical measure of the model's performance. The OOB score further validated the model's robustness and its capacity to generalise well to unseen data (0.74).

The analysis of variable importance shed light on the most influential factors in the model's predictions. By identifying which variables contribute most significantly to the outcome, stakeholders can gain valuable insights into the underlying patterns and relationships within the data (Figure 2).

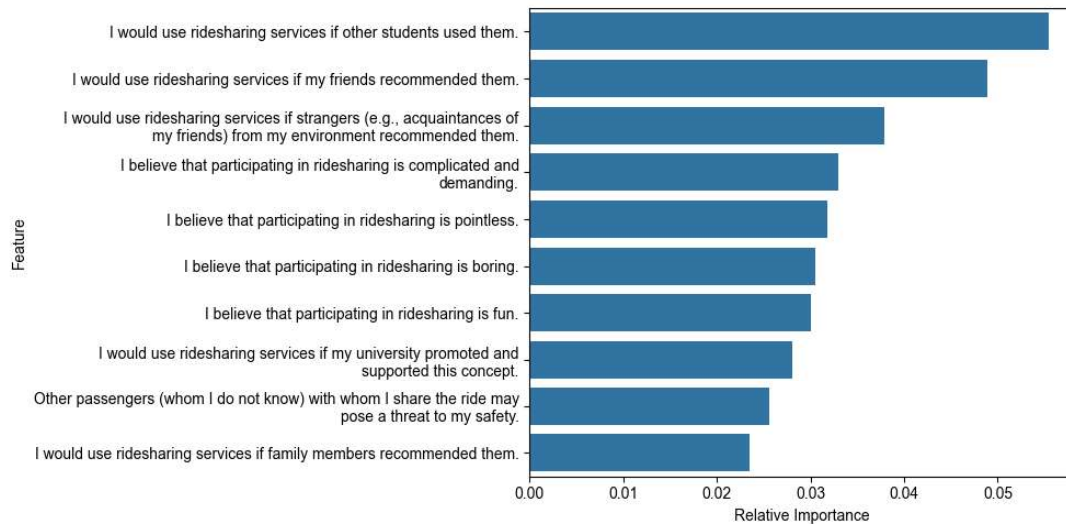


Figure 2. Top 10 variable importances in Random Forest Classifier (Source: Authors' work)

Results of our experimental study indicated the sample's strongest affinity towards various aspects of social context. Out of ten measurement items five belong to „social influence“ from different peers (e.g. students, friends, strangers, university, family members) – including the top three. This influence also called word-of-mouth is very important for sharing experiences in service industries where outcomes are intangible and challenging to measure (Goh et al., 2015). Our finding is unsurprising, particularly given that social interaction between participants in the sharing economy lies at its core.

Perceived enjoyment accounts for four out of top ten items. Building friendships, connecting with other people and pleasant experiences through the shared ride impose an important social value to potential consumers. The significance of enjoyment as the most important dimension related to participation in ridesharing concept was also confirmed in other studies (e.g., Amirikae & Evangelopoulos, 2018).

Our research, conducted among Serbian students, sheds lights on the preferences of first-time users of ridesharing concept. The findings hold significance for the burgeoning sharing mobility market in Serbia. The top preferences identified in our study have the potential to shape market operators' penetration strategies, particularly in catering to the preferences and motives of prospective consumers, especially within the student population.

5 Conclusion

The paper considered the impact of perceived risks, perceived economic benefits, social reputation, perceived enjoyment, perceived social and media influence as well as the influence of eWOM on intention to use ridesharing service. Our findings underscore the paramount importance of social influences, such as word-of-mouth and perceived enjoyment, in determining users' intentions towards ridesharing adoption. These factors not only highlight the intrinsic social nature of ridesharing but also suggest that positive experiences and recommendations from peers are crucial in fostering adoption among first-time users. Moreover, our analysis revealed that negative perceptions regarding the complexity and safety of ridesharing pose significant barriers to its adoption. These insights are instrumental for ridesharing service providers, indicating a need for clear communication strategies to address misconceptions and enhance the perceived ease and safety of ridesharing.

As ridesharing continues to evolve as a significant component of the sharing mobility, our study offers valuable insights for market operators. The identification of key factors influencing ridesharing adoption can guide the development of targeted strategies to attract potential users, emphasizing the role of social influence, the enhancement of user experience, and the mitigation of perceived risks.

Future research should aim to expand the demographic scope beyond university students to include a broader spectrum of potential users, enhancing the generalizability of the findings. Additionally, segmenting potential consumers based on the importance of variables can be a powerful strategy for customizing services to specific market segments (see for example Živojinović & Zornić, 2022).

In conclusion, our study contributes to the burgeoning field of sharing economy research by providing a nuanced understanding of the factors influencing ridesharing adoption. For sharing mobility providers, acknowledging, and leveraging these insights can lead to more effective market penetration strategies, ultimately facilitating a transition towards more sustainable forms of transportation.

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Unlocking Opportunities for Logistics Operators: An Exploration of the Sharing Economy in Automotive Industry

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Abstract. *The sharing economy provides a mechanism for the temporary utilization of underexploited resources, offering advantages to service providers, platforms, and end-users. This study critically examines the impediments and advantages associated with the integration of a sharing economy business model in the automotive industry, specifically concerning the transport of returnable packaging. Employing a methodology that combines literature analysis and expert opinions in the domains of the sharing economy, logistics, and the automotive sector, the research utilizes the Best-Worst Method for data analysis. The acquired results offer preliminary insights into the merits and challenges inherent in transitioning to this novel service model, establishing a foundational framework for subsequent research endeavours within the automotive industry.*

Keywords. *sharing economy, logistics, automotive industry, best-worst method*

1 Introduction

Under the influence of digital technologies, platforms are being developed for the direct connection of resource/service providers and users. This model of direct connecting offer and demand can be found in the literature under the concepts: sharing economy, collaborative economy, on-demand economy, etc. Sharing economy (SE) has a potential for increasing the efficiency of resources by substituting private ownership with temporary access, which benefits both the environment and the economy. It enables the maximum utilization of products and services by mobilizing social stock resources, which overturned the traditional need to increase new investment to stimulate economic growth continuously (Lombardi et al., 2017). Following the success of sharing economy business model in accommodation and transport many other fields are embracing this opportunity including the sector of logistics, where sharing economy is still in its infancy. This paper aims to investigate the potentials of the sharing economy in the automotive industry using returnable packaging transport (RPT) as a case study. Based on the experts' opinion and application of the Best-Worst Method obstacles and benefits of using sharing economy platforms for RPT are obtained offering preliminary insights on the potentials of this novel service model. The paper is structured into five main parts. After the introduction a brief overview on the uptake of sharing economy in the field of logistics is presented. The third part is about the methodology of research followed by the application, a case study. The paper concludes with main findings and future research directions.

2 Literature review

The introduction of sharing economy platforms in logistics is related to the end of the 20th and the beginning of the 21st century. One of the first platforms was Timocom, developed in Germany in 1997 (Table 1). The dominant regions utilising this business model in logistics are Europe, USA and the China which is the fastest developing market. Some of the platforms developed in this area are Freightos (sharing in freight transport) and Jobdoh (labor sharing). Some platforms are expanding their scope, e.g. Coyote open offices in Netherlands a year after it was launched in USA. Emerging

economies are also, although slowly, embracing this model, e.g. European platforms Timocom and KleverCargo have representative offices in Serbia.

Table 1. Examples of sharing economy platforms in logistics

Platform, country of origin, launch year	Services offered:
Timocom , Germany, 1997	Enables connecting companies that provide logistics services (transportation, storage) with users. In addition, the platform provides IT support, support for route optimization, collection of claims and necessary documentation.
Road Carrier , Australia, 2009	Offer of unused transport capacities
Freightos , Hong Kong, 2012	Connects thousands of global logistics providers, importers, airlines, ocean liners and leading technology players in order to realize transport efficiently.
Jobdoh , Hong Kong, 2014	Connects companies that have redundant employees, can transfer them to another company, where they do not have to pay them the total salary, because it will be paid by the company that hires them.
Coyote , USA, 2014	Identifying carrier capacity, connecting with users and scheduling transportation
Loadsmart , USA, 2014	Logistic solution which via platform provide automating how freight is priced, booked and shipped.
Saloodo! , Germany, 2016	Allows transporters to find cargo, in order to avoid empty runs, and enables companies to find vehicles quickly and easily.
Lognet , Croatia, 2019	Connects transport orders with carriers, buyers with suppliers, and the warehouse with all parties with whom it is in contact.
KleverCargo , Serbia, 2023	The platform provides the possibility of sharing transport and storage. Users who need transport or storage services can easily find available capacities.

The DHL, a world leader of innovations in logistics, is also exploring new business models of the sharing economy in three segments: transport, workforce and warehouse capacities and parking space. DHL has developed a transport sharing platform Saloodo! and pioneered a platform DHL Spaces too offer unused warehouse space (Heutger et al. 2017). The platform offers to users the exact location of the space and how many square meters are available, and provides contact information for booking the space. A competitor to DHL spaces is the Fleke platform from America. Compared to the traditional way of providing logistic services and particularly RPT, SE platforms offer several advantages like expanding the service request to a larger number of companies, reducing staff efforts, less time to complete the service, etc. (Table 2). However, building a trust in platforms may prevent its larger uptake. Traditional option may be seen as safer based on the company's previous familiarity with service provider.

Table 2. Comparative analysis of the traditional way organization and organization through the platform (Source: Authors' work)

Traditional model	Sharing economy model
The request is sent by mail (by phone) to the selected companies	The request is placed on the platform and it is available to a large number of companies
Knowledge of the company's work (service quality) based on previous experience	Monitoring the company's performance through reviews posted by previous users
Forwarding the same request multiple times	A request made once is enough
Intensive engagement of employees to find a vehicle	The platform performs the matching itself, the engagement of employees is only necessary when placing a request
Monitoring the status of the vehicle by contacting the company's operator	Real-time vehicle status tracking (GPS)

Shift to the SE in logistics requires comprehensive understanding of the perceived pros and cons of this model from the potential users which is the subject of this research. Using an example of RPT service of a real world company in automotive industry, main obstacles and benefits of this shift are examined.

3 Methodology

This applied methodology entails five main steps (Figure 1). In the first step main obstacles and benefits of SE model in logistics are extracted and structured. These are further subjected to the appraisal from experts: academic (from the field of SE and field of logistics) and practitioners engaged in the service delivery in the observed company. Best-Worst Method (BWM) was applied to calculate weights and rank obstacles and benefits.



Figure 1. Methodology steps

BWM was chosen as an easy-to-use method for weight calculation and ranking and is proven to be useful in this type of research (Govindan et al., 2020). This method helps decision maker to choose which criteria from a group of n criteria is the best and which is the worst (Rezaei, 2015). In this work a five step procedure is applied as proposed in Zhang (2021). The steps are:

1. Defining a set of obstacles and benefits for analysis;
2. Determining the best (e.g. most desirable, most important) and the worst (e.g. least desirable, least important) obstacle/benefit (based on the expert's opinion);
3. Determining the preference of the best criteria over all the other criteria using a number between 1 and 9;
4. Determining the preference of the best criteria over all the other criteria using a number between 1 and 9;
5. Calculating the optimal weights for obstacles/benefits (eq. 1).

BWM is applied with the following equation and BWM Solver (Rezaei, 2015):

$$\min \max_j \{ |W_B - a_{Bj}W_B|, |W_j - a_{jW}W_W| \} \quad (1)$$

With limitation:

$$\sum_j x_j = 1$$

$$x_j > 0, \text{ for all } j,$$

where a_{Bj} indicates the preference of the best criterion B over criterion j. It is clear that $a_{BB} = 1$. a_{jW} indicates the preference of the criterion j over the worst criterion W. It is clear that $a_{WW} = 1$. W_B , W_W and W_j are unknown weights of the best, worst and j criteria, respectively.

The application of BWM also included the following recommendation for the case of a larger number of ranking units (here obstacles): obstacles are first grouped into several clusters to gain another level in the hierarchy and problem solving (Zhang, 2021). Obstacles were grouped into 2 clusters and BWM is applied separately for these clusters. Obstacle weights obtained using BWM are multiplied by the weight of the associated cluster. In this case, there are only 2 clusters, so the weights are assigned based on expert opinion. In the case of multiple clusters, their ranking is also done using BWM. The first cluster includes obstacles which have directly affect the company's operations and the second cluster includes obstacles which have indirect effect.

4 Case study

The methodology is applied to a real-world example a company from automotive industry which is currently using traditional approach for RPT service. The RPT service involves the transport of returnable packaging between the company and customers. This packaging is industrial and they are mainly used in industrial environments for product transportation and storage (Katsanakis et al., 2023).

Some branches of the company in other countries are already utilizing SE platforms for RPT. The obstacles are collected from the work of Manzooret al. (2022), Govidan et al. (2020) and Fellander et al. (2015). Manzooret al. (2022) analysed the obstacles to the introduction of the sharing economy in the automotive industry, while the rest of the studies dealt with general obstacles. Benefits are extracted based on the works of Sadik et al. (2023), Ocicka et al. (2017) and Yildiz et al. (2019). All these studies are about the general benefits of the sharing economy in logistics. Obstacles and benefits of the shift to SE platforms for RPT service along with rankings obtained by BWM method are presented in Table 3. According to results, the most influential obstacle is threatened privacy, and the least influential is lack of determination and commitment of the company's management. The most pronounced benefit is the optimization of logistics costs and the least pronounced is the creation of business partnerships.

Table 3. The rank of obstacles and benefits after using BWM (Source: Authors' work)

Rank	Obstacles	Weights	Benefits	Weights
1	Threatened privacy	0.21	Optimization of transport routes	0.28
2	A small number of platforms on offer	0.20	Optimization of logistics costs	0.28
3	The fear of breach of the company's reputation	0.12	Activation of unused resources	0.17
4	Lack of awareness about the benefits of the sharing economy	0.12	Ecologically oriented solution	0.09
5	Impossibility of predicting the flow of resources	0.08	Reduced number of empty rides	0.07
6	The risk of delivering services on time	0.06	Expansion of the range of services	0.05
7	Lack of expertise to use the platform	0.06	Monitoring in real time	0.04
8	Lack of will to change	0.05	Creation of business partnerships	0.02
9	Absence of regulation for the platform and guidelines for users	0.05		
10	Lack of determination and commitment of the company's management	0.02		
11	Distrust in the platform, inability to assess its reliability	0.02		

Privacy risk is perceived as the biggest obstacles to larger SE adoption in our research which aligns with findings of previous studies in and out of the field of logistics. Another detected problem is the small number of SE platforms in the field. The company's reputation and its rating on user portals is recognised as the key for success to further partnerships. In line, the fear of breach of the company's reputation effects the decision to accept SE platforms for RPT service. Companies fear that when using the platform, they cannot predict the flow of resources which is a direct risk of service availability, and can damage their Just-In-Time business model. All mentioned obstacles have a direct impact on company reputation. The benefits detected as the most influential are the optimization of transport routes and the optimization of logistics costs. This implies that the respondent recognize SE model as a solution that aims to reduce environmental impact by optimizing storage and transport capacities.

5 Conclusion

This study analysed the potentials of sharing economy platforms in the automotive industry for returnable transport packaging. By examining relevant literature in the field, a set of potential obstacles and benefits was extracted. Using the Best-Worst Method, they are ranked based on the opinions of academic experts and practitioners. The method was applied using a real-world example - a branch of an automotive industry company operating in Serbia. The obstacles identified as the most influential are threatened privacy, the small number of platforms on offer, the fear of a breach of the company's reputation, and the impossibility of predicting resource flows (service availability risk). These obstacles may hinder management decisions to use sharing economy platforms for Returnable Transport Packaging (RPT) and imply that raising awareness and providing training on the 'how and why' of using SE platforms may alleviate management reluctance. Good practice examples and experiences from peer companies can be of great help. Top ranked benefits according to the results

are optimization of transport routes, optimization of logistics costs, activation of potentially unused resources and positive ecological impact. Other obstacles and benefits obtained smaller scores, but they should not be ignored. Each recognized obstacles and benefits provides a basis for better management decision-making. The presented results offer only one approach to unlocking potentials of SE platforms for logistics, limited to one service and one company as case study. It is a pre-scanning exercise while full implementation requires additional steps and methodological improvements in order to have a final insight on what drives and what hinders using SE platforms for RPT in automotive industry. Future research should be aimed at multi stage analysis of obstacles and benefits that would entail a preliminary analysis, before moving to the final evaluation of both obstacles and benefits. This should also include considering some other methods or combining with BWM to assure robustness of the results.

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Backer Profiling: What Drives Engagement in Crowdfunding?

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Abstract. Crowdfunding represents a contemporary paradigm in project financing, wherein capital is sourced from a multitude of individuals, termed backers, via online platforms. Given the pivotal role of fundraising in project outcomes, comprehending backer attitudes assumes paramount significance. This study endeavours to delineate distinct backer profiles predicated on the underlying motives guiding their engagement in crowdfunding. To achieve this objective, empirical data was acquired through a structured questionnaire and subsequent analysis employing fuzzy-set qualitative comparative analysis (fsQCA) was undertaken. The findings of this investigation furnish insights into the heterogeneous nature of backer motivations, thus enabling the formulation of targeted recommendations for campaign creators aimed at effectively engaging diverse backer profiles.

Keywords. crowdfunding, backer profiles, person-centric approach, fsQCA analysis

1 Introduction

The sharing economy manifests in various sectors: accommodation, transport, services and finance. In Serbia, platforms are predominantly utilised to access accommodation and transport services, while they are less commonly employed to acquire necessary funds (Živojinović et al., 2022). This new way of fundraising is in its early stages. Crowdfunding, or group financing, involves a public appeal, primarily conducted over the Internet, for the procurement of financial resources (Schwienbacher & Larralde, 2010). Considering the project category being financed and the type of returns investors expect (financial returns, non-monetary rewards, or personal satisfaction), three different types of crowdfunding can be identified: (1) investment-based crowdfunding, (2) reward-based crowdfunding and (3) donation-based crowdfunding (Bojković et al., 2022). Considering that individuals are not solely driven by one, but by various motives when making investment decisions, the aim of this paper is to identify backer profiles in Serbia based on the motives that drive them to participate in crowdfunding. This research aims to contribute not just to the literature but also to practice by providing recommendations for campaign creators on how to attract different types of backers, especially considering the setting characterised by underdeveloped financial and capital markets, a low level of investment culture and limited opportunities for individuals to invest their free cash flows. This study represents one of the few works that adopt a person-centric approach in analysing the motives of backers, particularly within the context of Serbia, marking it as a pioneering endeavour in this domain. Based on the aim of the paper, our research question is: What backer profiles exist in Serbia?

2 Literature review

Since group financing is a relatively new concept, both its theoretical framework and associated empirical studies are still in the early stages (Baah-Peprah et al., 2024). Research conducted so far has primarily focused on understanding the motivations behind individuals becoming backers (He et al.,

2024; Nayer et al., 2024), as well as identifying the barriers or risks associated with this form of investment. It's unsurprising that a deeper understanding of the motives behind backers' investments, along with the risks they face in doing so, can be especially valuable for platform representatives and project initiators. One of the most widely embraced and applied frameworks for understanding motivation is the extrinsic-intrinsic dichotomy, developed by Deci and Ryan (Moysidou & Spaeth, 2016). Extrinsic motivation stems from external rewards, which could include factors beyond material gain, like recognition or new opportunities. In contrast, intrinsic motivation is driven by internal satisfaction, such as the desire for personal growth or the joy of facing challenges. Moreover, (Zhang & Chen, 2019) identify two broad categories of investment motives: those focused on others (altruistic) and those focused on oneself (egoistic). Popescul et al. (2020) classify backer motives into individual and social aspects, encompassing intrinsic, extrinsic, and image-enhancing desires, as well as the need for community belonging. Understanding the diverse motives driving backers is crucial for explaining variations in their behaviour (Cox et al., 2018). This insight informs the design of mechanisms to advance crowdfunding for the benefit of all stakeholders. Additionally, Ryu and Kim (2016) identify four types of crowdfunding sponsors based on six key motives: interest, playfulness, philanthropy, reward, relationship and recognition. Delgosha et al. (2024) conducted an analysis of individuals engaged in civic crowdfunding endeavours. Utilizing a framework comprising three categories of motives, namely identity orientations (individualistic, prosocial and collective), instrumental motives (collective, social and reward) and emotional appraisal (positive and negative emotions), they discerned five distinct citizen profiles potentially involved in civic crowdfunding: prosocial advocates, civic champions, reward seekers, normative supporters and regret-averse contributors.

3 Methodology and results of the analysis

For the purpose of conducting the survey, a questionnaire was developed to scrutinize the motivational aspects of respondents' engagement with crowdfunding as backers. The study identifies backers' profiles based on their investment motives using six variables: (1) need for recognition; (2) self-image building; (3) sense of belonging; (4) financial benefit; (5) functional value; and (6) receiving rewards. These variables, derived from prior research (Živanović et al., 2023), represent various motivations for crowdfunding participation. The diverse sample of 208 respondents varied in education, income, risk attitude and investment experience. Understanding their motivations necessitates a person-centric approach. Hence, the study employs a case-oriented, fuzzy-set Qualitative Comparative Analysis (fsQCA) to scrutinise configurational profiles (Iannacci et al., 2021). Before analyzing motivational aspects, convergent and discriminant validity were assessed (Cheung et al., 2023). Convergent validity, confirmed by Cronbach's alpha ($CA > 0.7$), composite reliability ($CR > 0.76$) and average variance extracted ($AVE > 0.52$) and discriminant validity, verified through comparisons of square roots of AVEs and inter-construct correlations, were satisfactory. Factor analysis highlighted six constructs for annotation: need for recognition, self-image building, sense of belonging, financial benefit, functional value and receiving reward. Multicollinearity was absent (VIF scores < 1.6) among independent variables. Construct values underwent calibration transformation, using a standard technique based on Likert scale bounds (1-5).

Table 1. Configural profiles identified as an intermediate fsQCA solution (Source: Authors' work)

Backer profile	<i>Emotional belongers</i>	<i>Fund- sumers</i>	<i>Reward pursuers</i>	<i>Rational belongers</i>	<i>Primus inter pares supporters</i>	<i>Status seekers</i>	<i>Rock stars</i>
Constructs							
Need for recognition	⊗		⊗		●	●	●
Self-image building	⊗	⊗	⊗	⊗	⊗		⊗
Sense of belonging	●	⊗		●	●		⊗
Financial benefit	⊗	⊗	⊗	•		•	



Functional value		●		●		●	●
Receiving reward			●		●	●	
Consistency	0.79	0.78	0.77	0.87	0.91	0.93	0.87
Raw coverage	0.25	0.26	0.29	0.59	0.45	0.55	0.28
Unique coverage	0.001	0.002	0.002	0.13	0.04	0.11	0.02
Overall solution consistency					0.74		
Overall solution coverage					0.91		

Note: ● - depicts the presence of a construct in a particular solution (large circles indicate the presence of core construct, small circles indicate the presence of complementary constructs); ⊗ - depicts the absence of a construct in a particular solution (large circles indicate the absence of core construct, small circles indicate the absence of complementary constructs); Blank spaces signify 'not important'.

The output of the fsQCA analysis is represented in Table 1. Values for consistency are all greater than 0.7 and raw coverage spans between 0.25 to 0.59 which meets the acceptable terms of meaningful output results. Based on the result of the fsQCA analysis, 7 profiles of backers are identified as relevant based on the value of raw coverage (value greater than 0.25). A description of characteristics and motives for participation in crowdfunding for these profiles is given in Table 2. In the same table, recommendations for campaign creators on how to attract these different profiles are given.

Table 2. Profiles of backers (Source: Authors' work)

Backers profile	Characteristics	How to attract them?
<i>Emotional belongsers</i>	The exclusive motivation of backers falling within this profile is to foster a sense of community and establish connections with new individuals. Whether their investments lead to attaining any financial benefits holds no significance. Consequently, these backers are not driven by rational personal interests.	Crowdfunding campaigns tailored to <i>emotional belongsers</i> should refrain from highlighting specific personal benefits. Campaigns should highlight the project's contribution to the social community, emphasising improvements in areas such as collective health, recreation, sports, animal protection and more.
<i>Fundsumers</i>	This particular profile of backers is primarily motivated to finance campaigns that yield a final product with practical and functional value for their personal use, irrespective of the financial returns they earn. Termed <i>fundsumers</i> , this profile combines the concepts of funders and consumers, akin to the notion of <i>prosumers</i> . They are distinctly pragmatic and goal-oriented.	Crowdfunding campaigns tailored for <i>fundsumers</i> should provide meticulous descriptions of the features and functionalities of the products or services resulting from the funded project. They are willing to invest in campaigns that may offer low or no returns, as long as the end product holds significant functional value for them.
<i>Reward pursuers</i>	This backer profile prioritises non-monetary rewards over financial returns, unlike <i>fundsumers</i> . They invest expecting to receive a tangible product or service directly from fundraisers, rather than purchasing it later on the market like <i>fundsumers</i> .	Crowdfunding campaigns for <i>reward pursuers</i> should emphasise the array of non-monetary rewards available upon project completion, ranging from symbolic to tangible offerings.
<i>Rational belongsers</i>	These backers are driven by the sense of belonging to the backer community and connecting with fellow community members. However, unlike <i>emotional belongsers</i> who invest in crowdfunding solely for the sense of community, <i>rational belongsers</i> are additionally motivated by the prospect of achieving financial returns and supporting projects with functional value for them.	Crowdfunding campaigns directed at <i>rational belongsers</i> should underscore the importance of the backer community, not as an end in itself, but as a community with specific interests and influence. In addition, these campaigns should emphasise the combination of the financial return that the project brings and the functionality of the resulting project.



<i>Primus inter pares supporters</i>	The primary motivations driving investment within this cohort of backers encompass a dual desire: the attainment of acknowledgement from fellow crowdfunding participants and a sense of belonging to the broader backer community. Thus, this particular group of backers manifests a combination of individualistic and collectivist motives.	Campaigns directed towards these backers should emphasise project dimensions related to encouraging creative ideas, enhancing the environment and demonstrating social responsibility. Personalised rewards, such as custom items (e.g., t-shirts, mugs) featuring the backer's name, among other forms of recognition, should be highlighted.
<i>Status seekers</i>	These backers view crowdfunding as a means to enhance their social status and material wealth. They seek recognition from fellow participants to bolster their personal brand and anticipate tangible returns on their investment, monetary or non-monetary.	Campaigns catering to <i>status-seeking backers</i> should include mechanisms for public recognition, such as featuring backers' names or photos on websites and issuing personalised thank-you notes. Emphasising expected returns, both monetary and non-monetary, is also essential.
<i>Rock stars</i>	Investors are primarily motivated by seeking recognition within the crowdfunding community, shunning broader community affiliation, and embracing individualism. Their investments aim to garner acknowledgement from others for their contribution to campaign success.	Campaigns targeting these backers should focus on facilitating public recognition of their contributions. <i>Rock stars</i> , indifferent to rewards but interested in the project's value, can be targeted for projects personally significant to them.

Drawing from the identified distinct profiles of backers and their respective characteristics, potential types of crowdfunding tailored to each unique profile were proposed, as showed in Table 3.

Table 3. Crowdfunding type per backer profile (Source: Authors' work)

Crowdfunding type per backer profile	<i>Emotional belongsers</i>	<i>Fund-sumers</i>	<i>Reward pursuers</i>	<i>Rational belongsers</i>	<i>Primus inter pares supporters</i>	<i>Status seekers</i>	<i>Rock stars</i>
Investment-based		Yes		Yes		Yes	Yes
Reward-based		Yes	Yes		Yes	Yes	Yes
Donation-based	Yes	Yes					Yes

4 Conclusion

Through fsQCA analysis, we identified and analyzed seven distinct supporter profiles in Serbia, providing insights for campaign creators to attract diverse backers and enabling more targeted crowdfunding strategies. This is crucial given Serbia's underdeveloped financial markets and limited investment opportunities. Our findings offer valuable contributions to the advancement of crowdfunding models in the country, supporting its evolving entrepreneurial landscape. Furthermore, they pave the way for future research into the dynamics of crowdfunding within emerging economies.

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Farm to Fork Initiative Towards Sharing Economy in Serbian Agriculture: A Case Study of Farmit Startup

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Abstract. *This paper presents the main business outline of the Farmit startup. Farmit is an online platform aimed at connecting customers from urban areas with small farmers. Using the app, customers create their virtual garden and choose vegetables they would like to have planted. Farmers plant that ratio of vegetables on their fields and deliver the vegetables from that ratio strip to the customers. This paper gives a theoretical outline of the sharing economy and the Farm to Fork concept and describes their similarities. Using a case study approach, it proposes a business model to fit into strategic directions based on the abovementioned concepts.*

Keywords. *Farm to Fork, sharing economy, business model*

1 Introduction

This paper presents one of the initiatives for the sharing economy in Serbian agriculture, aligned with the Farm to Fork initiative. As a part of the European Green Deal (Fetting, 2020), a Farm to Fork initiative is aimed at four main goals: Sustainable food production; Sustainable food processing and distribution; Sustainable food consumption; Food loss and waste prevention (Gheoldus & Gheoldus, 2019; Hudecová, Nagyová, Mušínská & Horská, 2022; Kiran, Prasad & Mohan, 2023).

A sharing economy can be defined as a concept based on social and economic premises of the sharing of resources, development of digital platforms to facilitate large-scale connections between demand and supply, improving the usage of underutilized assets, promotion of collaborative consumption (Cohen, McClelland, & Gough, 2019).

The basic idea is to enable the utilization and exploitation of results without direct and often costly ownership of resources, which can be applied in the agricultural industry specifically for high fixed cost and capital ownership required for the utilization of results.

Searching for suitable business models related to the above-described concepts is challenging, and a trial-and-error approach might yield the best results. With relatively low entry and exit barriers, startups that digitally transform food distribution can converge towards optimal business models following the laws of organizational population ecology (Hannan & Freeman, 1977), since only the fittest will survive and grow into sustainable business systems. We also have to consider that digital transformation in the field has to pass the threshold and be much more efficient than current means of food distribution with a much lower volume than traditional systems, which have an economy of scale competitive advantage.

This article presents the basic business outline of Farmit, a Serbian startup platform that enables users to rent a garden, select the planted vegetable portfolio, and deliver the crop from their garden directly to them during the extended harvest season. It is envisioned as a two-sided platform, directly connecting the farmers with the consumers. The article is based on a case study method. Data was gathered using the existing documentation, interviews and questionnaires. A specific business outline of the company is described and discussed within a theoretical framework of the sharing economy and Farm to Fork.

2 Literature review – Farm to Fork and the Sharing Economy

Expected outcomes of the Farm to Fork and the Sharing economy in agriculture mostly overlapped in the key areas of optimal usage of resources and sustainable technical, business and management solutions. Both theoretical concepts rely on social engagement and need strong, dedicated communities for the success of their business application. Optimization of distribution networks and promotion of local farming practices, the goals of Farmit, are tools in the Farm to Fork process (Kneafsey et al, 2013; Asian, Hafezalkotob, John, 2019; Sridar et al, 2023). The application of sharing economy within Farm to Fork framework includes using digital platforms to utilize existing resources (Moltene & Orsato, 2021). The functionalities of the platform, covered by Farmit, enable the participants in the network to share and rent agricultural resources and even trade, maximizing resource utilization and helping reduce food waste (Botsman & Rogers, 2010).

A novel business model in food distribution, proposed by Farmit, is building an essential element in the sharing economy, trust and relationships. Local farmers can use the platform to connect with their consumers in nearby cities, and eliminating intermediaries improves communication lines. Within a Farm to Fork food distribution system, trust is an important factor of success (Kadoić, Tomičić-Pupek & Vrček, 2020; Kadoić, Tomičić-Pupek & Vrček, 2021). Since Farmit is still exploring the functionalities and possibilities of the platform, increased trust and social cohesion can lead to economies of scope, where a community can use the social capital developed on the platform to exchange or create other values. That leads to more resilient and cohesive communities (Hamari et al., 2015) – shorter supply chains are less prone to the bullwhip effect (Stromer, 2021), more trust leads to diminished transaction costs and more solidarity during the crisis, a large set of smaller players is more adaptable to the different environment compared to several large supply chain participants.

3 Farmit – about the company

Farmit (2024) is a multi-sided online platform for connecting customers from urban areas with small farmers. Customers can create their garden on an online app by choosing their favourite vegetables and planting them through the app. Farmers create custom-made gardens with vegetables the user has selected on the app. Farmers plant and maintain gardens throughout the year on their land while users can monitor the progress from the initial stages of growth to harvesting and delivery through the application. Once the harvesting comes, users get their vegetables delivered to their homes. Farmit launched operations last year in Serbia with the primary objective of validating the business model proposed by the company. The initial traction affirmed the solid demand for the product. In the current year, 2024, Farmit team has already overachieved last year's results by fivefold, proving excellent market acceptance and growth. Management plans to expand into the European Union market by the end of 2024, with Portugal or Italy emerging as potential target regions.

3.1 Farmit sharing economy-based supply chain

The vegetable supply chain usually implies considerable length, with a notable absence of direct connection between food producers (farmers) and consumers. This disconnection creates a situation where the primary producers receive disproportionately low compensation for their efforts, owing to the dominance of larger intermediaries in the chain. Consequently, farmers often prioritize quantity over quality, increasing pesticide usage to meet market demands. Moreover, the issue of food waste looms large, with approximately half of all vegetables succumbing to spoilage within the food distribution network.

Farmit introduces a shift by establishing direct links between farmers and end-users, fostering equitable compensation for producers while affording urban consumers access to locally sourced, fresh, and nutritious vegetables. By bypassing intermediaries and having planned production in place, Farmit effectively reduces food waste. Furthermore, Farmit empowers consumers through our app to monitor the entire vegetable cultivation process - from seed to harvest - ensuring transparency at every stage of the Farm to Fork journey, with evident environmental benefits. Differences are illustrated in the figure 1.



Figure 1. Traditional supply chain vs Farmit Farm to Fork based supply chain (Source: Authors' work)

3.2. Farmit process

Farmit operates on a subscription-based model, sharing the farmer's resources and efforts with the customers. Throughout the cultivation journey, users can track progress, from the initial stages of growth to harvesting and delivery, all within the application. Upon harvest, users receive their selected vegetables every week directly at their doorstep on the same day, ensuring freshness and quality and diminishing storage costs, transaction costs, food waste, usage of pesticides, vegetable preservation agents and delivery time. The process is presented in Figure 2.



Figure 2. Farmit Farm to Fork based process (Source: Authors' work)

4 Discussion and conclusions

The business model of Farmit is presented in the figure below, using the Osterwalder and Pigneur (2011) canvas. Due to the limited space, the discussion does not elaborate on similarities between platforms aimed towards the same goals (Simonovits, & Balázs, 2022), which can be a goal for future research. Similarity shared between the Farm to Fork and sharing economy applied in the Farmit business model is the challenge of the traditional business models of production, distribution and consumption. Among other challenges, this is one of humankind's major revolutionary achievements –industrialized agricultural mass production. As a "zero" industrial revolution that preceded the commonly dubbed first industrial revolution for roughly ten thousand years, the transition from a hunter-gatherer model towards sedentary agricultural production and animal herding brought much progress. Still, typical mass-produced monocultures also endanger long-term soil health and biodiverse environment (Garnett et al., 2013). Farm to Fork, like the sharing economy, uses the potential of information and communication technology to keep the best of both worlds, keeping the efficiency of the mass industrialized agricultural system while diminishing its major flaws and negative impacts. Technological advancements through the eras were followed by an increase in the scale of agricultural production, a larger average size of land parcels, more specialization in the division of labour and the supply chains, and increased efficiency and economy of scale. While the agricultural yields increased, average field size became higher, efficiency was improved, and mechanized power removed human labour in agriculture, some aspects constantly seemed off in the concept of mass agricultural production. Just as in most applications of technological progress, presented advancements also increased collateral negative impacts. The sharing economy transforms traditional mass production business models, decreasing the importance of major capital investments (and significant economy of scale) by offering access without ownership (Schor, 2014). Farmit's business model fits the goals of both the sharing economy and the Farm to Fork. A survey on the very limited sample of 13, all random current Farmit users, has shown that 53.8% of the users have increased their vegetable intake and that 69.2% find the delivered quantities adequate. Users who find delivered quantities larger than needed have described ways to share them with family and



friends, which diminishes food waste. The proposed business model, a contestant in the recent race for the new standard for doing business in novel agricultural platforms, enables all those benefits.

<p>Key Partners</p> <ul style="list-style-type: none"> • Key partners would be local farmers and logistics partners. • Key suppliers are agricultural equipment suppliers, seed and plant suppliers. • Key resources to acquire from our partners would be access to land and farming infrastructure, expertise, knowledge and logistics solutions. 	<p>Key Activities</p> <ul style="list-style-type: none"> • Sourcing and Procurement: Establishing relationships with local farmers • Supply Chain Management: Managing the entire supply chain process, including logistics • Quality Control: Implementing quality control measures to ensure that the vegetables meet the required standards for freshness, safety, and quality. • Online Platform or App Development: Developing and maintaining an online platform for customers to place orders, track deliveries, and manage subscriptions. 	<p>Value Proposition</p> <ul style="list-style-type: none"> • On the urban consumer side, farmit secures a steady supply of seasonal and healthy vegetables. Also we provide control and insight into the growing of vegetables that they choose for their garden. We offer them a bundle that includes seasonal vegetables from a shared garden, and a premium bundle which is a personal, custom garden where farmers grow vegetables just for consumers that pick the premium bundle. • Aid in the distribution of farming products with acceptable planning of ensured sales • We bring value to our farmers by securing them an exact amount of users they will serve in a season which results in safe placement while making them earn 4 times more money. 	<p>Customer Relationships</p> <ul style="list-style-type: none"> • We will establish a personalized relationship with end consumers via social networks and our customer support • On the other end we will keep our farmers in a transparent and fair relationship which is based on mutual benefits and collaboration. 	<p>Customer Segments</p> <p>We segmented our market into two target groups:</p> <ul style="list-style-type: none"> • Small farmers with limited access to the supply chain and within a range of 150km near large cities. Their farms range from 0.5-3ha, do not have safe placement and are struck by low profits due to supply chain issues. • Urban consumers with healthy lifestyle and eating habits. Mainly families in Belgrade, with higher income, who love to cook, willing to spend more in order to secure healthy food for their kids or individuals who live a healthy lifestyle and want a more transparent way of securing their own vegetables.
<p>Cost Structure</p> <ul style="list-style-type: none"> • Most important costs for our business model are human resources, transportation, sales and marketing, quality control and application development costs. 	<p>Revenue Streams</p> <ul style="list-style-type: none"> • Monthly and annual subscriptions for a garden • Up-saled products • Cooking sessions 			<p>Channels</p> <ul style="list-style-type: none"> • Website https://farmit.rs • Delivery service • Social media platforms • Agricultural suppliers • Right now we are using all of the above channels in order to secure brand awareness and build trust on both ends.

Figure 4. Farmit Farm to Fork and sharing economy based business model (Source: Authors' work)

Our main conclusion is that, according to the theory of population ecology in organizations (Hannan & Freeman, 1977), organizations currently implementing the Farm to Fork concepts are going through a variation phase of the population ecology three-stage process (Jaško, Čudanov, Jevtić & Krivokapić, 2014). Many platforms with different business models are expected to emerge. Organization and strategy are identified as important factors of entrepreneurial success (Mihajlović, Marinković & Rakićević, 2023). They are expressed through a business model to become a key factor in the selection phase and a main determinant of which platforms and organizations will fail, which will merely survive and which will become a business standard in the future.

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Navigating the Landscape of Sharing Economy: Servitization-based Business Model Innovation

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Abstract. Contemporary business environment alongside the advancement of digital technologies inspires organizations to adopt different business model innovations, embracing concepts like product-service systems (PS systems) and sharing economy. Both approaches are primarily about the creation of added value for those involved in the ecosystem by focusing on providing access to goods and services rather than pure ownership. Consequently, this leads to achieving resource optimization, step-forward sustainable development and advancing overall user experience. While a shift toward models enriched by services, promises enhanced customer value, it also entails uncertainties, organizational challenges and various risks, including managerial, operational or financial. Therefore, this paper examines and compares servitization-based business models grounded on recognized features from the available literature. This should be a starting point for a better understanding of the mutual value of these approaches and the corresponding effects of their application.

Keywords. Business model innovation, servitization, product-service systems, sharing economy

1 Introduction

The wide array of contemporary business models has emerged influenced by many different elements of modern business landscape, but the importance of the sharing economy can't be denied in this context. The integration of sharing economy principles into product-service systems (PS systems) fosters innovative approaches to value creation and resource utilization. Traditional approaches, to balancing and utilising conflicted and inseparable offer and demand side of the market, have been reshaped beyond recognition, offering never ending spectrum of infinite possibilities for entrepreneurial and creative thinking (Curtis, 2021). This wave of innovative structures is associated with collaborative consumption, exploitation of underutilized resources and translation of technology among different industries. The phenomenon of sharing resources and other elements of businesses has sparked a thorough examination and pivoting of existing business models, as well as the development and implementation of new business strategies. These endeavours are typically aimed at ensuring efficient resource usage and enhancing the consumer experience (Öberg, 2023).

Blossoming in this environment, a diverse collection of innovative business models has sprung, bringing to light colourful group of unique ways to design, create and deliver value, each challenging conservative and common notions of ownership, transactions, belongings and utilization. The wisdom that has developed from those concepts suggests that there is a way to leverage technology and social constructs to facilitate collaborative ventures, and the examples can be found ranging from peer-to-peer rental platforms, through co-working spaces, all the way to subscription-based services and product-service hybrids (Curtis, 2021). In order to find a way to differentiate themselves from the competition in these lucrative surroundings, within the wide spectrum of innovative business models, strategists have directed their attention particularly on different ways to address evolving consumer preferences and demands. It is no wonder, then, that there is a primary focus on service-oriented patterns and hybrid PS systems. These approaches can provide the additional value that customers seek, either through delivering intangible services or integrating services within tangible product offerings.

2 Critical Examination of Theoretical Background and Literature

2.1 Sharing Economy Business Models

During the previous decade, sharing economy has blurred borders of industries, shifted traditional playing field for competition and redefined the way we see value creation (Öberg, 2023). Those swings have allowed for both well-known global giants, as well as small startups to try their chances in this innovative environment, delivering remarkable examples that range from Uber and Airbnb, to BlaBlaCar, BeWelcome and WeWork, and all the different platforms of varying size in between (Constantiou et al., 2017). This has also encouraged authors to do extensive bibliometric analysis, to fill the gaps and critically evaluate the extant literature on this subject (Duan, 2023).

The restructured business models, while not entirely novel, leverage digital technologies to enable a broader spectrum of business models, reflecting a growing trend of firms adopting multiple models to cater to diverse market segments or products (Li, 2020). Business models and platforms that sprung in a setting created by sharing economy principles, can be distinguished from traditional networks of suppliers or third-party intermediaries, because they combine both organisational and structural mechanisms, as well as market mechanisms, creating additional value along the way for the ever-evolving needs of customers (Barbu et al., 2018).

Evaluation among business models in literature is usually done by comparison between traditional ones and the ones induced by contemporary business landscape (Gatautis et al., 2018). When it comes to frameworks that can be used for assessing different types of business models, different authors have different approaches. Research (Gatautis et al., 2018) shows that Business Model Canvas by Osterwalder and Pigneur, can be used for qualitative analysis, with authors comparing local and global organizations that provide accommodation among categories like value proposition, customer segments, channels and support, and key activities, resources and partners, along with cost structure and revenue streams. Other authors (Munoz & Cohen, 2017) suggest that analysis should be done using descriptive criteria: (1) how much the business depends on a digital or physical platform for collaboration, (2) degree to which resources are shared, (3) varieties and significance of peer-to-peer interactions and transactions, (4) degree to which the business is receptive to integrate the users into value creation activities and benefits, (5) how pivotal are social and environmental value and impacts concerning economic value and the overall business operations, (6) to what degree does the business employ or emphasize alternative funding sources (grants, crowdfunding, or equity-based crowdfunding) throughout various stages of the venturing, and (7) how much does the business depend on technology.

2.2 Product-Service System

In the aforementioned context, taking into consideration that it is essential to adapt and pivot traditional structures in order to satisfy contemporary consumers, it is no wonder that shifting to the services has become a necessity (Bigdeli et al., 2018). PS systems embody a specific combination of tangible products and intangible services, which are represented in variable ratios depending primarily on the capability to gratify customer needs (Somers et al., 2018).

Amidst evolving business conditions, innovating business models can offer a competitive edge, even more so as product-oriented companies typically consider services as cost factors rather than revenue sources (Park et al., 2012). The concept of PS system, commonly explored in manufacturing and product-oriented sectors, holds considerable promise for service industries too, especially with the transformative impact of new technologies like cloud technology on sales, delivery, and support methods (Mihailović et al., 2022). Integrating services with products dictate novel business models, transitioning "from services for free to services for fee" (Witell & Löfgren, 2013). This type of business transformation is known as servitization, and it has been a subject of interest in different research since the late nineteen-eighties (Fritze, et al., 2018). Services focused on data, like condition monitoring and remote services, are becoming foundational for providing PS system, where customers pay based on production units rather than fixed fees (Soellner et al., 2024). Even though there are a lot of benefits to be gained from creating additional value for customer by providing them with added services, organizations stand to encounter significant challenges during this transformative process, mostly due to the fact that they can't simply modify some parts of their operations, but they have to change the entire manner of conducting their business.

2.3 Servitization-based Business Models

The phenomenon of servitization has shepherded the development of a unique subset of business models that emphasize long-term customer relationships, continuous value delivery, and revenue streams based not only on sales of goods, but also on service provision. Those models can be categorized using numerous criteria depending on the purpose of classification.

Business model categorisation that will be used for analysis in this paper is by far the most supported in the literature and it is based on differences in terms of creating, delivering and capturing value, establishing three distinct business models, based on the subject of a contract and ownership: 1) product-oriented services, which involve selling products with added services; 2) use-oriented services, where the provider retains ownership of the product and offers it in a different form; and 3) result-oriented services, where the agreement is based on achieving a specific outcome without a predefined product (Tukker, 2004). Each model possesses distinct attributes, benefits, and risks, and familiarity with these traits aids organizations in selecting the most suitable business model aligned with their objectives, resources, and market dynamics. The following section will explore their similarities and differences.

3 Comparative Analysis

Business models based on *product-oriented services* entail selling of goods, but the value for the customer is enriched by adding service to the package. In this way, ownership is transferred to the customer. Illustrative examples can be found with Tesla (offers electric vehicles with added services like software updates and access to charging infrastructure), or Sony PlayStation (sells gaming consoles with added services like online multiplayer and exclusive content). In that sense (Tukker, 2004) offers two more specific types of PS system: *product related service* and *advice and consultancy*.

The second category is defined by *use-oriented services* where product still plays the key role, but the business model is not based on selling goods, and the ownership stays with the provider, while customer has a chance to use it and often share it with others, creating the following subtypes: *product lease, product renting or sharing, product pooling* (Tukker, 2004). These types of models are represented by Zipcar (offers car-sharing services where the provider retains ownership of the vehicles and offers them for use by customers) or WeWork (offers co-working space services where the provider retains ownership of the office spaces and offers them for use by entrepreneurs and businesses).

Third and the last type of business model is defined by *result-oriented services*, where there is a principal agreement between a provider and a customer about a wanted result, but there is no pre-determined product involved, and it can be in the form of *activity management/outsourcing, pay per service unit or functional result* (Tukker, 2004). Examples can be illustrated by Uber (offers transportation services where the agreement is based on achieving a specific outcome, such as reaching a destination), and Upwork (provides freelancing services where the agreement is based on completing a project).

Comprehensive overview of discussed characteristics is provided in the Table 1, enabling a straightforward comparison of the advantages and disadvantages of the described types of models.

4 Discussion and Conclusion

Each of the mentioned business models has its own specific characteristics, advantages and risks associated with it. Models based on result-oriented services have a high degree of flexibility, innovation and economic viability, but at the same time, they carry high risks and security challenges. On the other hand, the model based on product-oriented services may have high economic viability and demands the least adaptation to traditional models, but it also implies lower innovation and environmental sustainability. Comparison of value creation, sustainability and resource utilization on one hand and the potential risks and need for adaptation on the other, is of most value when choosing between different servitization-based business models.

Product-service innovation may not consistently yield anticipated benefits nor enhance firms' likelihood of survival. Organizations that plan to engage in product-service integration must take into consideration the possibility of early-stage financial losses due to heightened investment in business transformation.



Table 1. Comparison of Servitization-based Business Models (Source: Authors' work)

Criterion	PRODUCT-ORIENTED SERVICES	USE-ORIENTED SERVICES	RESULT-ORIENTED SERVICES
Type of product / service	Selling products with added services	Provider retains ownership and offers it in a different form	Agreement based on achieving a specific outcome
Ownership of product	Customer	Provider (until the end of agreement period)	Ownership isn't tied to a specific product and it is shared based on the agreement
Flexibility & User experience quality	The emphasis is more on the functionality and features of the product rather than the service aspect	Allows for customization and tailoring of the service to meet individual user needs	Since the focus is on achieving a specific outcome rather than owning a product, there's a strong emphasis on delivering value and meeting customer expectations
Resource Sharing Potential	Typically, low (because the ownership of the product remains with the customer, limiting the scope for resource sharing)	Typically, high (provider can facilitate resource sharing among multiple users)	Moderate to high (agreement is based on achieving a specific outcome and depending on the extent to which the provider facilitates sharing)
Environmental and Economic Sustainability	Emphasis is on selling products, which can lead to increased consumption and waste, but the economic sustainability may be higher as revenue is generated through product sales	Exhibits higher environmental sustainability (promotes resource efficiency through the sharing or reuse), can have favorable economic sustainability (subscriptions or fees)	Both environmental and economic sustainability in this model can vary depending on the specific outcome being targeted
Need for new capabilities, altering of organization structure or processes	May require fewer new capabilities and organizational changes since the focus is primarily on selling products with added services, with some level of adaptation to integrate services	Higher demand for new capabilities and a more significant alteration of organizational structure and processes (shifting from product-centric to service-centric operations)	Moderate to high since the focus is on delivering specific outcomes (organizations may need to develop specialized expertise, adopt new technologies, and reconfigure their operations)
Financial & Operational Risk	Moderately low financial and operational risks (due to reliance on predictable product sales revenue, and established manufacturing and distribution processes)	Moderate financial risks (investments in service infrastructure and technology), and higher operational risks (transition to service-centric operations and resource sharing complexities)	Potentially high financial risks (uncertain outcome delivery and resource-intensive investments) and moderate to high operational risks (planning and execution to achieve specific outcomes)

Entities must be ready to undertake significant operational risks amid high uncertainty when initiating and expanding service portfolios to provide value to customers (Bigdeli, et al., 2018). Assessing the balance between value generation, sustainability, and resource management alongside the associated risks and additional requirements is crucial for selecting the most suitable type of business model.

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Sharing economy value congruence and employees' workplace satisfaction in co-working spaces

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Abstract. *The sharing economy paradigm inspires changes in various work-related domains by imposing the values of social cohesion, collaborative lifestyle and sustainability. The embodiment of this value system is seen in the evolving trend of co-working space. In order to investigate the relation between the perception of the presence of these specific values in office spatial features and the capacity of the workspace to satisfy the psychosocial needs of occupants, we conducted research on 81 employees working in different office types. It was found that employees recognize availability, collaboration, ability to create networks and openness, as more represented values and satisfaction with personalisation and territoriality more linked with them. Results also show that there is a correlation between perceived values and workspace satisfaction with the focus on the needs for status congruency that becomes more emphasized in traditional shared offices along with the identification needs, which becomes the challenge for modern co-working offices.*

Keywords. *Co-working spaces, sharing economy values, employees' workplace satisfaction*

1 Introduction

Co-working office is derived as the product of the sharing economy paradigm values in business and work environment planning, and it represents the sharing economy values. The world of work was facing the shift towards knowledge economy, turning to flexible working arrangements and pervasive changes in labour demographics (Clifton et al, 2022). These spaces are characterized by a collaborative work approach that provides emotional, professional, and financial support with flexible access to required resources for their occupants (Fuzi, 2015). It started as a reaction to the personal isolation of employees working remotely, from home and as the result of their need for community, support and sharing, along with the professional and financial benefits of using communal space and diverse professional networks (Spinuzzi, 2012). Sharing economy concepts of *social cohesion* and *sustainability* create a social context of specific cultural patterns based on values of openness, community, collaboration, sustainability, and accessibility (Schuerman, 2014), along with the post-materialist values of autonomy, spontaneity, mobility, availability, versatility, and ability to form networks (Müller, 2021). Employees may be satisfied with "ideologically" coloured features in the context of their psychosocial needs. This workspace satisfaction is affected by personal space, territoriality issues, personalization, identification, status congruency and privacy/interaction regulation (Kovačević, Čizmić, 2012).

The main problem of the study is how the co-working space concept as a sharing economy value satisfies the specific psychosocial needs of the occupants. Thus, the research goal is to investigate workplace satisfaction and the perception of the level of spatially represented sharing economy values within their workplace among employees occupying shared offices (with a focus on co-working space).

The objective of the study is to analyze 1) Do spatial features of the workspace conform to the sharing economy values – at what level? 2) How are employees satisfied with their workspace psychosocial

characteristics, and 3) Is there a correlation between their workspace satisfaction and perceived level of visual (spatial) representation of sharing economy values within co-working spaces they occupy?

Based on previous research that implies a strong connection between the co-working office concept and sharing economy paradigm (Bouncken & Reuschl, 2018; Durante & Turvani, 2018; Bouncken et al., 2020; Clifton et al., 2022;), as well as those concerning aspects of workspace satisfaction (Merrell et al., 2021; Bouncken et al., 2020; Lee, 2018) and especially according to work of Weijs-Perrée and colleagues (2019), we postulated the hypothesis:

H0: There is a correlation between workspace satisfaction and the level of the perceived congruence between sharing economy values and workspace layout.

2 Sharing economy values and new work arrangements

The emergence of sharing offices has transformed traditional workspaces into core business models for new business ventures (Bouncken & Reuschl, 2018). Associated with the sharing economy, co-working spaces embody values beyond mere office arrangements, representing a startup lifestyle and fostering a sense of community (Durante & Turvani, 2018; Belk, 2014). Participation, autonomy, community, and knowledge creation are core to satisfying workspaces in the digital and sharing economy (Bouncken et al., 2020). These spaces, characterized by openness, collaboration, and sustainability, facilitate knowledge sharing among professionals with diverse skills (Bouncken & Reuschl, 2018). Operating on principles of communal resources and shared values, they create an ideal environment, often termed a "co-working bubble" (Durante & Turvani, 2018). Such spaces prioritize flexibility, accessibility, and conviviality, aiming to enhance productivity and creativity (Fuzi, 2015).

Co-working embodies the concept of "working alone together," emphasizing independent work within a collaborative setting to boost productivity and creativity (Clifton et al., 2022). Recognized for fostering boundary-less work environments and collaborative learning, co-working spaces have become hubs for creativity (Fuzi, 2015). Many companies utilize co-working spaces to save resources and allow for remote work (Clifton et al., 2022). Definitions vary, but generally, co-working spaces are localized areas where independent professionals share resources and knowledge (Capdevila, 2013). They typically offer open workspace desks and facilities managed by co-working businesses (Durante & Turvani, 2018).

Workspace satisfaction, a component of overall job satisfaction, depends on how well the workspace aligns with individual preferences and needs (Knight & Haslam, 2010). Co-working spaces can fulfill employees' needs for autonomy, relatedness, and competence (Merrell et al., 2021; Lee, 2018). However, challenges such as noise, privacy issues, and lack of professionalism may arise (Bodin Danielsson & Bodin, 2008). While unassigned workstations can lead to dissatisfaction, desk-sharing doesn't necessarily affect organizational commitment negatively (Worek et al., 2019). Flexi-desk arrangements may decrease workplace productivity, influenced by factors like office layout and comfort (Kim et al., 2016). Occupants prefer inspiring, affordable spaces with semi-open layouts and homelike interiors (Weijs-Perrée et al., 2019).

3 Research design

Variables in this research include office type, workspace satisfaction and sharing economy values. Office type is a categorical variable covering six potential types of shared office: 1) co-working space with shared workplace, 2) co-working with fixed workplace, 3) deskbooking, 4) shared office of traditional type, 5) working from home, and 6) working individually in office.

The instrument used in the survey is a questionnaire consisting of demographic questions, general questions about employment and objective workspace features, 36 items of the Scale of satisfaction with workspace psychosocial features and the *Sharing economy values scale* consisting of 12 offered values to be recognized and assessed within spatial features at the respondents' workplace: 1) openness, 2) community, 3) collaboration, 4) sustainability, 5) accessibility, 6) autonomy, 7) spontaneity, 8) mobility, 9) availability, 10) creativity, 11) versatility, and 12) ability to form networks. The *Scale of satisfaction with workspace psychosocial features* (Kovačević, Čizmić, 2012) measures

the level at which workplace characteristics satisfy the social and psychological requirements of their occupants. It consists of 36 items covering 6 indicators of workspace satisfaction (personal space, territoriality, personalization, identification, status congruency, privacy/interaction), with internal reliability gained in a preliminary study ($\alpha=.91$). Our sample consisted of 81 employees from different industries, prevalently IT (51.9%), education (12.3%) and marketing (9.9%), employed in different organizational positions. More than 50% of respondents are from domestic companies, 13.6% are international with headquarters in Serbia and 35.8% are multinational with mainly large companies (42%) and small and medium-sized (25.9% and 19.8%) and only 12.3% of micro companies with less than 10 employees. Our sample is slightly biased towards female employees who cover 57% of the whole sample born in the period between 1980 and 2000 (a sample of a relatively young employable population), with almost 70% of them having less than 15 years of tenure.

4 Research results

In the context of the organization of daily work activities, respondents in our sample prevalently work in a shared offices (56%), followed by those working in a coworking space with fixed (19%) and shared workspace (15%), as it could be seen from the Figure 1.

Our primary interest was to see does employees working in different contemporary offices register the presence of current sharing economy values that are expected to be incorporated even in the physical spatial office features as the result of pervasive cultural, economic and social changes in the world of work. Also, these values and subjectively experienced objective office characteristics might provoke different levels of satisfaction that could be connected to these values. For these purposes, we use two scales that proved to have solid internal reliability.

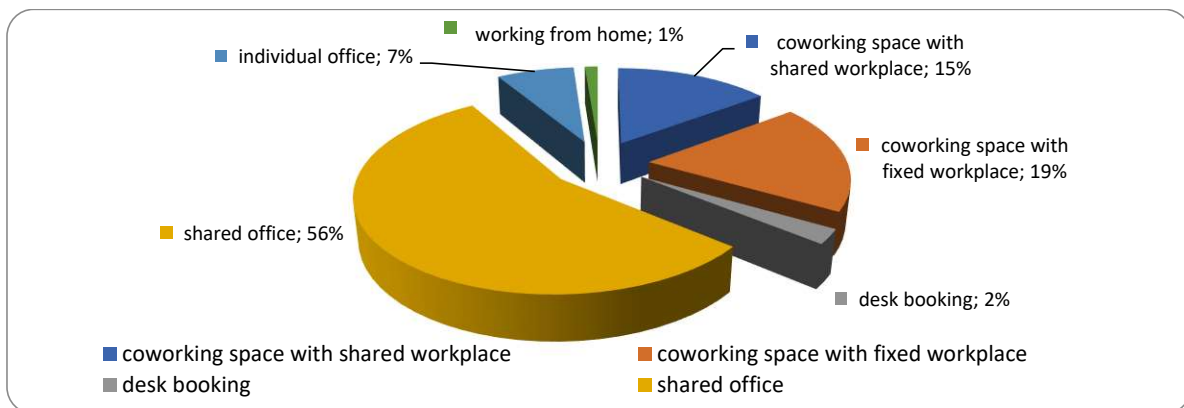


Figure 1. The percentages of respondents working in different office types (Source: Authors' work)

As the *Scale of satisfaction with workspace psychosocial features* consists of six indicators we tested their reliability individually, and in order to gain higher internal reliability we divided the component of privacy/interaction into two dimensions. Internal reliability of the scale of Sharing economy values is Cronbach's $\alpha(12)=.892$ and of the Workspace satisfaction scale Cronbach's $\alpha(36)=.82$ (subscale reliability varies from $\alpha=739$ to $\alpha=868$). The main sharing economy values recognized are those of accessibility ($M=4.28$, $SD=.762$, $N=81$), collaboration ($M=4.19$, $SD=.91$, $N=81$), networking ($M=4.11$, $SD=.962$, $N=81$) and openness ($M=4.06$, $SD=1.017$, $N=81$) and the least one area of autonomy ($M=3.58$, $SD=1.047$, $N=81$) and creativity ($M=3.64$, $SD=1.197$, $N=81$). Nevertheless, the variance is large between the answers. When it comes to satisfaction it is slightly higher than average ($M=3.6$, $SD=.466$, $N=81$) with the highest for personal space ($M=4.09$, $SD=.846$, $N=81$) and status congruency ($M=4.07$, $SD=.721$, $N=81$) and the lowest for identification ($M=2.97$, $SD=.884$, $N=81$) need satisfaction.

The main goal of the research was to test the hypothesis of the relation between perceiving the sharing economy values at the workplace and the satisfaction with psychosocial features of the working office. Our results show that there is a moderate statistically significant correlation between these concepts: $r(81)=.34$, $p<.001$, where the main correlation is found between these values and status congruency satisfaction ($r(81)=.43$, $p<.001$) and low correlation with interaction and identification ($r(81)=.23$, $p<.05$ and $r(81)=.23$, $p<.005$). When you take into consideration the actual

spatial work arrangement, one interesting question is imposing: do the variances in office space layout make any difference in the satisfaction and value recognition, as well as in the relation between them?

Table 1. Correlations between perceiving sharing economy values and workspace satisfaction indicators for co-working spaces and traditional sharing offices (Source: Authors' work)

	Sharing economy values					
	Office Type	Co-working			Traditional	
Satisfaction	r	Sig.	N	r	Sig.	N
Workspace satisfaction	.369*	.049	29	.52**	.000	45
Personal space	.203	.292	29	.21	.168	45
Territoriality	.255	.181	29	.01	.936	45
Personalization	.051	.792	29	.36*	.016	45
Identification	.018	.927	29	.41**	.005	45
Status congruency	.448*	.015	29	.56**	.000	45
Privacy	.219	.253	29	.01	.967	45
Interaction	.090	.641	29	.35*	.018	45

When we exclude cases of employees working alone in the office and take into consideration only those who are using co-working spaces of different kinds and, on the other side, those using traditional shared offices with only a few colleagues, we found some differences. There were no differences in the values they perceived but there were in the satisfaction with workplace features in general ($t(72)=-3.942$, $p<.001$) and connected with the opportunities to personalize it ($t(72)=-4.005$, $p<.001$) and preserve own territoriality ($t(72)=-3.262$, $p<.001$), that are higher in traditional shared offices. If we focus on partial correlations between sharing economy values and workspace satisfaction for co-working offices and for traditional shared offices separately, some relations are revealed. From Table 1 we can see that, besides the status congruency that is linked with values in both cases, the link between value recognition and identification as the indicator of satisfaction becomes obvious with the relatively strong correlation of $r(45)=.41$, $p<.001$.

5 Discussion and Conclusion

The main idea of the research was to connect the values that are ascribed to be of sharing economy culture potential, their visibility in the physical work environment with the workspace satisfaction. We found that there is a positive correlation between recognizing these values and indicators of that satisfaction. Additionally, availability, networking potential, collaboration, and openness are values that are considered present in current offices. There are substantial differences in workspace satisfaction if we compare traditional shared offices and co-working spaces. Partial correlations reveal higher satisfaction in traditional communal offices with status congruency being stronger as the indicator linked with values, as well as identification becoming an important indicator, not correlated with sharing economy values in co-working spaces. These findings are in line with previous studies (Bacevice, & Spreitzer, 2023). Also, concepts of personalization and territoriality are recognized as the indicators that make a difference favoring traditional shared offices with workplaces defined in advance and with fixed working desks. Kim and colleagues' (2016) study implies less satisfaction among employees using flexi-desk arrangements. These results are similar to the studies that found higher satisfaction of psychosocial needs provided by the workspace features (see Kovačević, & Čizmić, 2012) in more confined working spaces than in open offices shared with more users. As if the more is not the merrier in the context of the working environment. Work activities must not be neglected and further research should consider that more systematically. Studies that corroborate the satisfaction of co-working spaces emphasize their superiority in the context of entrepreneurial and start-up micro businesses (Bouncken et al, 2020).

Our sample is limited and the number of categories working in different office types does not represent the actual situation while categories of differently organized space are not comparable. The results are the first explorative study in the domain, that aims to link workspace satisfaction with sharing economy values. In order to gain a deeper understanding of the concept, there should be more studies incorporating the values of the occupants themselves that might or might not be in line with prevalent values of the contemporary organizational culture. Further, some aspects of co-working space were not possible to analyze due to the sample restriction. In order to see the differential effect of fixed or

desk booking practice of office policy, especially on territoriality and personalization issues, we need more cases of the particular practices. Also, identification satisfaction is significantly linked with sharing economy values recognition in traditional sharing offices. The fact that occupants of communal offices in a traditional sense link strongly the sharing economy values with identification with the office space might be the challenge for co-working spaces to convey values more explicitly in order to satisfy identification needs.

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Youth for Contemporary Sustainable Transport Solutions: Insights from a Survey of Engineering Students

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Abstract. *The adoption of innovative transport solutions is a challenge and to great extent relies on the attitudes and perception of user on prospects of new technologies where new services based on sharing economy stand out. Results show dissatisfaction with current infrastructure supporting sustainable transport and low satisfaction with bicycle and pedestrian paths. However, students believe technology can greatly enhance urban transportation efficiency. This study highlights the importance of researching students' attitudes and provides a foundation for increasing their engagement in the development of sustainable transport solutions.*

Keywords. *New technologies, Transport, Students, Attitudes*

1 Introduction

Conducting research on students of technical faculties aimed to examine their attitudes towards sustainable transport and the infrastructure that supports it. Primarily, the study investigated the modes of transportation used by young individuals and the extent of their usage, to include students who are relevant to the research, i.e., those using any form of transportation. This research represents a comprehensive overview of how young people perceive transport, as well as the problems present within it and how they can be addressed. Nowadays, an increasing number of young people are beginning to consider where they plan to lead their lives. One of the most crucial aspects of a healthy lifestyle is a healthy environment, achieved through transitioning to sustainable transport, which undoubtedly improves living conditions. Young individuals, as a key category of every society, should be aware of how they can contribute to environmental preservation as individuals. Young people's views are crucial in decision-making processes, particularly in areas that directly impact them (Blakeslee & Walker, 2018). The research included their attitude towards the current situation of sustainable transport, its accessibility, traffic planning, as well as the integration of technology with traffic and its impact. By examining the attitudes of young people towards these issues, we actively contribute to creating a better community for the entire environment, and therefore, for the planet. Young adults, particularly those in urban areas, have shown a pragmatic attitude towards sustainable transport, desiring a system that is flexible, convenient, and affordable (Puhe & Schippl, 2014). The research involved 892 engineering students. This paper represents the beginning of research that will include numerous factors influencing the satisfaction of engineering students with transportation in Belgrade. The idea is that from these factors, through a series of analyses, strategies will emerge to improve the comprehensive attitude towards transportation.

2 Literature review

The current urban infrastructure is not fully designed to support sustainable forms of transport, as it lacks effective governance, fair funding, and strategic infrastructure investments (Kennedy, 2005), which is in line with the attitudes of our respondents. This is further complicated by the need for a sustainable transport paradigm and analytical framework (Zuidgeest, 2005). The integration of infrastructure systems is crucial for designing more sustainable cities (French, 2014), and the role of the built

environment in promoting 'greener' travel is a key consideration (Crane, 2003). Research on pedestrian and bicyclist satisfaction with roadways has found that factors such as traffic volume, speed, and the presence of pedestrian and bicycle facilities significantly influence satisfaction (Jensen, 2007), which is correlated with what was examined in the research. The availability of bicycle infrastructure, including bike lanes, has been shown to improve perceptions of bicycling safety (Branion-Calles, 2019), which is an important factor for the safety of traffic participants. Baang (2000) emphasizes the need for better tools and understanding of factors influencing traffic flow, while Coq (1973) suggests a comprehensive approach that includes both traffic organization and changes in transport modes, which aligns with the attitudes of our respondents who stated that traffic planning is not at a satisfactory level. Fouladfar (2021) emphasizes the importance of integrating cloud computing, internet-connected vehicles, and IoT in traffic management systems. Florea (2014) and Marshall (2015) both highlight the positive impact of electronic intelligent transport systems and IoT on fuel savings, CO₂ emissions reduction, and overall transportation efficiency. Banister (2008) emphasizes the need for a more flexible transport planning paradigm to promote public acceptability of sustainable mobility measures, which also agrees with the opinion of young people from our research.

3 Methodology

The research was conducted on engineering students, specifically focusing on students of the Faculty of Organizational Sciences, who filled out the survey online. Data collection was completed by January 2024, and analysis began at that time. In our research, descriptive statistics were used to show the attitudes of young people on certain issues. Specifically, the mean and standard deviation were used to form conclusions based on the responses. Depending on the question, the scale on which they could rank their attitudes ranged from 1, representing general dissatisfaction or extreme disagreement with the given statement, to 5, representing great satisfaction or extreme agreement with the given statement.

In the research, descriptive statistics were used, specifically the mean, which represents the average attitude of young people towards the following questions:

- To what extent do you believe that the current urban infrastructure is designed to support sustainable forms of transport?
- How satisfied are you with the availability and condition of bicycle lanes and pedestrian paths in your city?
- In your opinion, how well does current traffic planning contribute to reducing congestion and improving traffic flow?
- To what extent do you believe that the integration of technology into traffic management can improve the efficiency of urban transportation?

To analyze the research results more clearly, they will be presented in tabular form, with each question presented separately. After each table, a comment on the results will be provided. The scale on which respondents ranked their attitudes ranges from 1 to 5, where 1 indicates general dissatisfaction or extreme disagreement with the statement, 5 indicates great satisfaction or extreme agreement with the statement, and 3 indicates neutrality or moderate impact on the specific question.

4 Research results

For the first question, the analysis of students' responses indicates their general skepticism about the effectiveness of the current infrastructure in supporting sustainable forms of transportation. The average rating given by students is 2.36, suggesting a relatively low belief in the adaptability of existing transport systems to sustainability. The standard deviation of 0.97 indicates variability in ratings, which may reflect differing levels of awareness or experience among students regarding this topic.

Similarly, concerning the second question, students expressed a high level of dissatisfaction with the number of bicycle lanes and pedestrian paths as integral parts of sustainable transport. The average rating for this item is 2.39, with a standard deviation of 1.041. These results point to a general perception

of a lack of adequate infrastructure for alternative forms of transport, which could be crucial for promoting sustainable solutions in urban areas.

The third question also reveals student dissatisfaction, this time regarding the contribution of traffic planning to reducing congestion. The mean value for this item is 2.23, with a standard deviation of 1.026. This low rating suggests that students believe current planning strategies are not sufficiently effective in addressing congestion issues, indicating a need for revision and improvement of existing approaches.

On the last question, students indicated that technology can significantly improve the efficiency of urban transportation. The average rating for this item is high, at 3.77, with a standard deviation of 0.924. These results suggest strong support for the application of technology in transportation, which could be crucial for enhancing systems and reducing the negative impacts of transportation on the environment.

Overall, these results indicate a need for significant improvement in infrastructure and planning strategies to support sustainable transportation solutions. Investments in these areas can have a positive impact on the perception and efficiency of transportation systems, contributing to the creation of more sustainable and efficient urban environments.

5 Discussion

The results indicate that there is a general dissatisfaction among young engineering students regarding the current urban infrastructure's support for sustainable transport. The low average ratings for questions related to bicycle lanes, pedestrian paths, and traffic planning suggest that students perceive these aspects of sustainable transport as lacking in their cities. The research aims to identify the attitudes of young engineers towards sustainable urban transport and the integration of technology in traffic management. Understanding these attitudes can be crucial for the development of new technological solutions that would cater to their needs and expectations. Additionally, the research can provide insights into potential shortcomings in current infrastructure and traffic planning, serving as a basis for future urban planning and development projects. Regarding its relevance to the sharing economy, the study's results can be valuable for companies involved in shared mobility. Understanding young people's attitudes towards technological innovations in transportation can help these companies develop more efficient and appealing services that could contribute to increased usage of shared transport options. This research can also benefit urban planners and authorities, providing them with insights into the priorities and needs of young individuals regarding urban transport. This could assist them in creating policies and strategies that support a sustainable and efficient transport system.

However, there is a more positive outlook regarding the integration of technology into traffic management, with students believing it can significantly improve urban transportation efficiency. These findings highlight the importance of addressing infrastructure and planning issues to promote sustainable transport among young people. Improving bicycle and pedestrian infrastructure, as well as implementing smart technology in traffic management, could help cities create more sustainable transportation systems that meet the needs and expectations of the younger generation. Knowledge, acquired through education and various life experiences, is considered essential by young people, aligning with the emphasis on the crucial role of knowledge in human advancement within the current educational system in Serbia (Petrović et al., 2024), which is particularly relevant for understanding the complexities of traffic issues and how to make informed decisions regarding transport.

6 Conclusion

Young engineering students have a critical role to play in advocating for and contributing to the development of sustainable transport solutions. This study represents an initial exploration into the attitudes of students towards transportation, serving as a foundational basis for further research in this area. It aims to provide a starting point for understanding how students perceive transportation, particularly in terms of its efficiency, sustainability, and technological integration. This research marks the beginning of a broader investigation into the complexities of student perceptions and experiences related to transportation systems, intending to lay the groundwork for more comprehensive studies in the future. Further research will compare whether there is a difference between the genders of students,

their financial status, but also, there are plans to expand the research to include all age groups, which would provide a better approach to the problem. This research has shown that young people believe there are problems in this area. Through further research, efforts will be made to develop specific strategies.

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Profiling Shared Accommodation Users: A Segmentation Study of European Countries

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Abstract. *This study explores how individuals from 30 European countries use online platforms to rent shared accommodation. Within the study, we used data from Eurostat's ICT survey, which collects information about people's use of technology. While the data has some limitations, the study was able to use 14 different indicators to segment countries into clusters. Countries differed in how much people used shared accommodation and these differences were related to factors such as education and family status. The study identified four distinct groups of countries based on how much people use shared accommodation. These groups show different stages of adoption of shared accommodation and provide insights into the characteristics of people who use them. The results of this study could be useful for decision-makers and policymakers, as well as individuals.*

Keywords. *Sharing economy, cluster analysis, shared accommodation, segmentation analysis, k-means*

1 Introduction

There is a long tradition of exchanging and sharing goods or services like cars, tools, time, or knowledge. In the past, these transactions mostly took place informally within families, among friends or neighbours, and sometimes within broader social circles. However, the digital economy's emergence and growth, especially with the development of the Internet, has considerably increased the possibilities for arranging such exchanges. Today, these transactions can occur between individuals who were previously unknown to each other and can be organised more efficiently due to reduced information and logistics costs (Basselier et al., 2018).

Sharing has been a part of human behaviour since ancient times, but collaborative consumption and the concept of the "sharing economy" are products of the Internet era (Belk, 2014). The use of sharing economy services has increased significantly in recent years, and based on predictions, the total value of the global sharing economy is expected to be 335 billion US dollars by 2025, compared to 14 billion US dollars in 2014 (Yaraghi & Ravi, 2017). The sharing economy is a system of peer-to-peer exchange enabled by information technology, in which individuals or businesses share unused goods or services through an intermediary without transferring ownership for either commercial or non-commercial reasons (Schlagwein et al., 2019). The sharing economy offers individuals an additional way to earn income, for example, driving for Lyft, selling products on Etsy, lending money on LendingClub, or providing services on Upwork. As a result, sharing economy companies are reshaping a large number of markets (Eckhardt et al., 2019).

One part of this phenomenon are online marketplaces that enable peer-to-peer accommodation rental services (Guttentag, 2015). Examples of such online markets are Airbnb, Vrbo and HomeAway. In the sharing economy, demographic characteristics like the level of education and age are important because higher levels of education are often connected to increased participation, and younger generations are usually actively engaged in these innovative platforms (Puschmann, 2016). The primary purpose of this research is to determine how European countries can be segmented according to the characteristics of those who use shared accommodation.

The next section explains the data collection procedure and the Eurostat indicators used in the study. Section three provides an overview of the results. The final section contains a discussion and concluding remarks.

2 Research methodology

Since online platforms that offer shared accommodation services are not obligated to share data and studies on this topic are often limited by the number of people participating, finding adequate data is no easy task. For this study, we used data available from Eurostat from the annual ICT (Information and Communications Technology) survey on the use of information technology by households and individuals in the European Union (EU). In addition to European Union members, data is also available on countries that are candidates for membership, such as Serbia, Bosnia and Herzegovina and Turkey. Since data is available for Switzerland and Norway, they are also included in the study. Despite being a member of the EU, Ireland is excluded from the research due to the severe lack of data. As a result, the research covers the 26 EU members (without Ireland), as well as Norway, Switzerland, Serbia, Turkey, and Bosnia and Herzegovina.

Eurostat has data on the sharing economy, and the values are calculated in percentages, which means the percentage of individuals in each of the listed countries who made an online purchase to rent shared accommodation from another individual. Furthermore, percentages are also provided based on unique demographic attributes like age and gender, level of education, presence or absence of children in the home, and manual labour involvement. To segment European countries based on the characteristics of users who use shared accommodations services via online platforms, the study included data on every relevant demographic factor that was accessible. The research was conducted with the latest available data, which is from 2023.

Data was gathered for the following 14 indicators: All Individuals [All], Individuals 16 to 24 years [16-24], Individuals 25 to 34 years [25-34], Individuals 35 to 44 years [35-44], Individuals 45 to 54 years [45-54], Individuals 55 to 64 years [55-64], Individuals 65 to 74 years [65-74], Individuals with no or low formal education [No/Low Edu], Individuals with medium formal education [Med Edu], Individuals with high formal education [High Edu], Non-manual including the armed forces [Non-manual], Manual [Manual], Individuals living in a household with children [With Children], Individuals living in a household without children [No Children]. Other indicators are disregarded due to the lack of data for every country included in the analysis or due to the low probability that the current values are correct. R software was used for the descriptive statistics and segmentation analysis. Descriptive statistics for these 14 indicators can be found in Table 1 presented below.

Table 1. Descriptive statistics of the observed 14 Eurostat indicators (Source: Author's work)

Indicator	Mean	Std	Min	Max
All	6.06	3.56	0.76	13.84
16-24	6.99	4.14	0.52	16.73
25-34	10.37	5.40	1.82	21.84
35-44	8.44	5.21	0.68	23.89
45 to 54	5.92	3.90	0.52	15.95
55-64	3.21	2.56	0.16	9.43
65-74	1.49	1.63	0.00	5.95
No/Low Edu	2.07	1.93	0.00	7.21
Med Edu	4.76	2.90	0.52	10.65
High Edu	11.27	6.43	1.93	30.77
Non-manual	7.44	4.45	0.62	16.37
Manual	5.41	3.31	0.87	13.44
No Children	3.49	2.89	0.17	14.26
With Children	9.55	5.00	1.66	21.27

Looking at the mean values, we can conclude that those with higher education are those who participate in the shared accommodation the most, the European average is as much as 11.27%. The results also point out that the older individuals are not participating in the concept. Standard deviations indicate that the greatest variability on the European level is seen within the group of the highly educated and those in the age range 25-34.

In order to use the k-means algorithm for segmentation, it was important to check if there were any outliers. Outliers can have an influence on the results of the k-means algorithm and the overall quality of the clustering structures. The p-value for each Mahalanobis distance was calculated using the Chi-Square statistic with 13 degrees of freedom. There were no outliers because the p-values were all above 0.001. However, Croatia was the closest to being an outlier, and since it influenced the algorithm's quality, it was not included in further analysis.

3 Research results

The k-means algorithm was used to segment 30 European countries based on the indicators mentioned earlier. Based on the silhouette score and taking into account cluster's size and structure, it was determined that European countries should be segmented into four groups. The first cluster has seven countries, the second has ten countries, the third has nine countries, and the fourth one contains four countries. Table 2 shows the mean values of each indicator per cluster and the cluster size.

Table 2. The mean values of chosen indicators per retained cluster (Source: Author's work)

Indicator/Cluster	Newcomers	Developing adopters	Progressive adopters	Advanced users
Cluster size	7	10	9	4
All	1.77	4.59	7.82	12.42
16-24	2.11	5.64	10.03	11.81
25-34	3.43	8.61	12.97	19.15
35-44	2.35	6.84	9.95	15.82
45 to 54	1.62	4.34	7.66	13.12
55-64	0.77	2.25	4.04	8.10
65-74	0.24	0.78	2.14	4.26
No/Low Edu	0.34	1.30	3.33	4.70
Med Edu	1.12	3.70	6.56	8.81
High Edu	3.72	9.39	13.18	19.98
Non-manual	2.03	5.93	9.05	15.08
Manual	1.65	3.90	7.30	11.24
No Children	0.93	2.56	3.81	6.88
With Children	3.06	8.24	11.35	18.70

Cluster number one depicts countries where shared accommodation is being introduced. Comparing all indicator values to values in other clusters, these countries show the lowest mean values. For example, the mean value for the indicator 'All Individuals', representing the percentage of people who used shared accommodation services, is barely 1.77%. This indicates that shared accommodation services are still in their infancy stage in these countries. Moreover, the mean values for other indicators such as 'Individuals with high formal education', 'Individuals 25 to 34 years' and 'Individuals living in a household with children' are rather low compared to other clusters. These nations could be seen as emerging markets for the shared economy, and in them, there is room for the shared accommodation market to grow.

Cluster number two comprises countries classified as developing adopters, where the use of shared accommodation services is moderate. The mean values for indicators across this cluster are higher than in Cluster 1 but lower than in Clusters 3 and 4. For instance, 'All Individuals' has the mean value of

4.59%, which indicates a moderate level of shared accommodation services uptake. Promising growth and growing acceptance of the shared economy concept can be expected in these countries.

The third cluster of countries exhibits an intermediate degree of familiarity with shared accommodation. These countries show a moderately established use of shared accommodation, with mean values higher than Clusters 1 and 2 but lower than Cluster 4. Indicator 'All Individuals' has the mean value of 7.82% and this represents a noteworthy proportion of the population engaged with a shared accommodation platform. These countries show a strong basis for future growth and development.

Cluster number four demonstrates countries with the extensive use of shared accommodation services. These countries show the highest mean values taking into account all indicators, stipulating a mature and widespread adoption of shared accommodation platforms. For example, the mean value for 'All Individuals' is 12.42%, showing a substantial percentage of the population using shared accommodation services. In addition, the mean values for 'Individuals with high formal education', 'Individuals 25 to 34 years' and 'Individuals living in a household with children' are significantly higher compared to other clusters. These countries are leaders in the shared economy space, with a strong ecosystem that supports services and platforms for shared housing. For an in-depth analysis, in Table 3, we listed out the countries based on the clusters they belong to.

Table 3. List of countries within each cluster (Source: Author's own work)

Cluster 1: Newcomers	Cluster 2: Developing adopters	Cluster 3: Progressive adopters	Cluster 4: Advanced users
Bulgaria	Germany	Czechia	Belgium
Cyprus	Lithuania	Denmark	France
Latvia	Austria	Estonia	Luxembourg
Hungary	Portugal	Greece	Switzerland
Poland	Romania	Spain	
Slovakia	Slovenia	Italy	
Turkey	Finland	Malta	
	Sweden	Netherland	
	Bosnia and Herzegovina	Norway	
	Serbia		

Most of the countries in Cluster 1, which stands for emerging markets, are located in Eastern Europe. These countries include Latvia, Bulgaria, and Hungary. Clusters 2 and 3, which are defined by a use that is steadily growing or relatively established, are a mix of countries from all parts of Europe. Cluster 4's Advanced Nations, which show extensive adoption, are mostly from Western Europe and include Belgium, France, and Switzerland.

4 Discussion and conclusion

Our study's observed clustering patterns show significant geographical differences in the uptake of shared housing platforms among European countries. A distinct division appears, showing a higher prevalence of shared accommodation use in Western Europe relative to Eastern Europe, with most Eastern European countries clustered in the first group and all Western European countries in the fourth. These findings can inform targeted strategies to reduce the disparity and promote equitable growth and development of the shared economy across Europe. The results in particular may assist sharing economy platforms in their efforts to target and segment their base of users. Furthermore, this insight is especially important for policymakers, managers, and politicians, as it can speak out initiatives aimed at increasing involvement in the sharing economy and fostering more balanced participation across regions. Moreover, these findings have implications for the future of the sharing economy, highlighting the importance of understanding and addressing the underlying factors that led to regional differences in adoption rates.

Even though this study offers insightful information about the dynamics of shared accommodation usage in Europe, it is crucial to recognise several limitations. Firstly, the study's geographical representation and conclusions might have been damaged by the removal of some nations from the analysis due to a lack of data. Additionally, the reliance on self-reported data from the Eurostat ICT survey may introduce biases or inaccuracies reflective of the respondents' perceptions rather than their actual behaviors. This limitation indicates that additional research and the inclusion of different data sources are necessary to improve the validity of our conclusions

Our study's results are also consistent with earlier research by Maričić and associates (2023), which used data from 2019 to show a similar rise in the adoption of shared accommodations throughout Europe. Given this finding, it would be intriguing to carry out additional research using the same indicators over a longer period of time, look at how nations have moved between clusters over time, and find trends and patterns.

Better results could be obtained by collecting data for other significant indicators and including them in the analysis. To perform additional analysis, it is suggested to use bicluster or other advanced clustering algorithms (Nikolic et al., 2022). Based on that, a deeper and more comprehensive analysis would be carried out.

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The Link Between the Psychology of the Leader and ESG Influenced Business Models in Family Businesses

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Abstract. *Family-owned businesses play a crucial role in driving ESG (Environmental, Social, and Governance) transformation by prioritizing legacy continuity for future generations. Their adaptability, value-driven strategies, and long-term outlook allow them to integrate ESG principles into daily operations. Research suggests that successors in these businesses introduce innovation and responsible practices, build strategic partnerships with relevant stakeholders and academic/research institutions with more ease, which helps shape new strategies ensuring sustained success. Our study examines the existing insights on the integration of ESG in family-owned businesses. These acquired insights inspired us to structure a survey which will help us better understand how successors' leadership styles impact ESG-driven strategy adoption in family-owned firms and explore their attitudes towards sharing economy business models.*

Keywords. *Family business, ESG, Innovation, Leadership styles, Psychological ownership, Sharing economy*

1 Introduction

The concept of sustainability is hardly a new one. Ever since 2015, the UN has actively promoted global action to protect human rights and the environment by advancing their Sustainable Development Goals (SDGs) with future generations in mind (United Nations, 2015). The novelty is the growing urgency to address these issues, since the public pressure has elevated their importance by introducing a mandatory new perspective in business strategy planning. While many companies have already grasped the importance of sustainability, including the financial and non-financial benefits of the Environmental, Social, and Governance (ESG) Framework integration into their practices (Pinheiro et al., 2023), especially bearing in mind the tendency of the upcoming younger generations to incline towards ethical companies when it comes to the selection of services/products (Brand et al., 2022; Djafarova & Fouts, 2022; Schönherr & Pikkemaat, 2023) as well as prospective careers (Deloitte, 2023; Heath & Yarick, 2021; Rzemieniak & Wawer, 2021; Scavarda et al., 2019), many are still reluctant to innovate in this direction, fearing a drop in profit and stakeholder support (Sheehan et al., 2023). Of particular interest is the case of family businesses (FBs), where one of the main objectives is to ensure the longevity of the business and its usefulness for the next generation. With greater decision-making freedom, they have an opportunity to pioneer sustainability efforts, retaining customers and quality workforce. This can be achieved by maintaining a sustainable reputation, implementing ESG practices internally, and supporting external causes through philanthropy (KPMG, 2023). As Serbia and other Western Balkan countries are faced with two important challenges — the transgenerational succession in the family-owned companies for the first time since 1945, and the demand for more responsible governance, the need for gaining deeper and more specific insights arises. We hope to provide policy-makers and other experts with a better understanding of the FBs' dynamics, through the psychology and business interplay, so they could provide FBs with structured support in their further growth and development. The survey which will follow up and support this study will identify which leadership styles

and behaviours favour the adoption of ESG practices and explore the prevalent business models within the circular economy framework that stem from the ESG principles and are commonly embraced by the FBs. It will also point out the similarities and differences in transgenerational leadership among the Western Balkan countries, and its impact on the ESG-influenced business strategies.

2 Literature review

Numerous studies have delved into the ESG adoption in family firms, leadership styles of the next generation, and the psychological aspects of the individual succession process. However, few articles have explored which leadership styles typical for the successive generations are most likely connected to driving and executing ESG-influenced business models aligned with the principles of sharing economy. To gain a deeper insight into the inner workings of FBs, we conducted a thorough literature review focusing on the key factors necessary to ensure the sustained success and longevity of these enterprises.

Previous researches have shown that FBs have a superior ability to identify opportunities and acquire knowledge outside their boundaries because of their non-economic goals. However, they are risk-averse and it is usually challenging for their owners to share control with non-family members (Casprini et al., 2017). When it comes to default risk, FBs may be even more cautious than non-FBs (Gomez-Mejia et al., 2007), as the owners of family firms typically have a significant amount of their personal wealth in the business, making them less inclined to take risky ventures (Blanco et al., 2012), compared to the corporations which have a more varied investment portfolio. While risk aversion may help protect the business in the short term, it could also hinder its long-term growth potential. ESG, on the other hand, can stimulate innovation in FBs through its three main pillars. FBs could map a broader pool of their stakeholders, and consider the ecological and social issues, as well as the future trends. They can identify their “strategic intervention points” (SIP) (BCG, 2021), or opportunities for innovative solutions, and integrate them in their business models. For European FBs, innovation ranks high on the agenda. A KPMG analysis (2019) reveals that 72% of European FBs consider innovation as crucial in the next two years. Additionally, the study highlights that FBs acknowledge the significance of innovation and digitalization as key drivers of growth. A substantial majority (86.2%) of FBs intend to engage with the digital economy (KPMG, 2019). To address the innovation challenge in FBs and identify opportunities for enhancing their innovation performance, some authors emphasize the need to examine innovation from three perspectives: strategic, transactional, and relational (Feranita et al., 2017). It is further suggested that FBs should pursue both exploratory and exploitative innovation strategies to thrive in a rapidly evolving technological landscape and fierce competition (Mueller et al., 2013). However, the effectiveness of these strategies in different institutional contexts, impacting stakeholder support for innovation initiatives, still remains uncertain. Recent research, though, suggests that integrating sustainability into a family firm's strategy not only ensures longevity and smooth succession planning but also enhances its attractiveness and competitiveness. Demonstrating care for ESG aspects can attract new clients and partners, reduce operating costs, and promote sustainable resource management, leading to increased profits (PwC, 2023). A study by École Polytechnique and BCG (Kachaner et al., 2012) has shown that FBs can outperform their competitors, i.e. public companies, specifically in times of crisis, because they concentrate their resources on building resilience instead of on short-time goals. Identified critical factors specific to FBs include: economic resilience in stable and unstable conditions, high CAPEX with minimal debt, conservative acquisition strategies focusing on smaller companies, emphasis on diversification and talent retention, and interest in geographical expansion or internationalization (PwC, 2023).

All these factors indicate that FBs build their competitive advantage on the core aspects of ESG. Current research, however, shows that a great number of leaders in FBs still haven't sufficiently prioritized sustainability matters. According to more recent data, only 38% of FBs worldwide have shifted their focus and resources towards sustainability adaptations, and only around 10% regard ESG issues as the most pressing ones for tackling in the coming years (PwC, 2023). While some of the recent research in the field has been aimed at measuring the benefits of implementing an innovative business approach which is mindful of ESG (e.g. Zhou et al., 2023), and the potential barriers still present (Sheehan et al., 2023), there is a notable lack of evidence related to the factors leading up to (or hindering) the adoption

of innovative ESG-friendly strategies in the family business environment. A study by Nikolakis, Oлару, and Kallmuenzer (2022) has revealed that favourable family dynamics can drive the adoption of environmental and social strategies (ESS) within family-owned businesses. The authors analysed the impact of family trust, conflict, and socio-emotional wealth (SEW) on ESS decision-making and their interplay with various trade-offs in diverse cultural landscapes, and their findings indicate that relationships among family members correlate with ESS selection.

Given the specificity of the core constituents used in the aforementioned study and the lack of other research further examining similar matters, it could be useful to test whether other concepts such as personal values of the people on the key positions, their leadership styles, and their identification with the company play a role in the strategy design when it comes to ESG integration, as factors of this kind have been shown to influence the managers' readiness to innovate and make other relevant decisions in some cases (e.g. Rau et al., 2019; Ruf et al., 2020). The existing lack of comprehensive understanding (at least on the theoretical level) of the relationship between leadership styles and leadership behaviors indicates the need for a unifying framework that can help identify similarities and differences between these two concepts. While leadership styles and behaviors (defined as the methods used by leaders to influence the actions of their employees, by motivating them and establishing guidelines) have been studied over the years within the general management and leadership literature (e.g. Fries et al., 2021), they were insufficiently connected to the context of family businesses, which has caused these two areas to research progress rather independently. In addition, there is a significant knowledge gap regarding the input-process-output models that could outline the connections between the factors influencing specific leadership styles and behaviors, and their resulting outcomes in family enterprises, even though it is crucial to a certain extent to understand the typical leadership approaches adopted by family business leaders (i.e. leadership propensity), their impact on success metrics (e.g. performance) within the family firm, and their broader implications on both the company and the family unit (including factors ranging from innovation to employee well-being). Last but not least, it is very important to also address the inter-generational differences in leadership and other relevant tendencies, as succession planning and innovation have been shown to be in correlation in family-owned businesses (Ballal & Bapat, 2019). Previous studies have shown that successive generations of leaders in FBs prioritize social responsibility and sustainability, driving transformative business models. With strategic succession planning, they become pivotal for value creation, revitalizing the FB through innovation in processes, products, digitalization, professionalization, and internationalization. Additionally, they are inclined to form strategic partnerships with stakeholders, academic institutions and scientific institutes, generating transgenerational value despite transforming their core business structure in a way (Lazzarotti & Sciascia, 2023).

The aim of this paper is to present the rationale and the research plan for the study of inter-generational differences and the underlying relationships between the participants' leadership styles, personal values related to sustainability, their identification with the firm and their willingness to include an ESG-innovative approach, mindful of the sharing economy practices, when creating a strategy in family firms in the Western Balkans, of varying previous success with the implementation of sustainability measures. Reflecting on the occasional tendency of the succeeding generation not to continue the family legacy for a variety of reasons (Zellweger et al., 2010), especially on the territory of Serbia, where most young people migrate to Western countries for education and/or work (Mašović et al., 2017), we will also evaluate the next generation's interest in working for the family company, taking into account the level of compliance of the company's ESG efforts with the potential successor's personal values. Our main hypotheses include the following:

H1: The personal sustainability values of family members, across generations, positively impact the development and implementation of ESG innovation strategies, including sharing economy practices, within the FB, particularly when there is a strong identification with the firm among family members.

H2: The alignment of the firm's ESG strategy with personal sustainability-related values will positively influence the readiness to commit to the firm in case of the next generation, but will have little to no impact on the members of the older generation.

H3: The leadership styles of the next generation will show a higher correlation with ESG-related strategies, including sharing economy practices.

We believe that the study will further enrich our understanding of at least some segments of the reasoning behind sustainable strategy creation in family companies, especially bearing in mind their

distinctive ability to give momentum to the much-needed ESG revolution in the business world of today, which is closely tied to sharing economy towards which the consumers are rapidly shifting (Barbu et al., 2018).

3 Methodology

3.1 Participants

The first version of the survey will be administered to the owners of the FBs and their successors in Serbia, Montenegro and Bosnia and Herzegovina. As most of the sample is planned to consist of active members of their respective chambers of commerce and industry, the survey will be provided directly to the sections' directors who will promote it and share it with the relevant target groups.

3.2 Materials and Procedure

The participants will fill out an online survey consisting of several segments. After the demographic data, the participants will fill out the first part of the questionnaire aiming to identify their leadership styles. The classification in this study will be based on the previous taxonomy generated by Fries, Kammerlander & Leitterstorf (2021), adapted specifically to the case of FBs. The second part will be The Sustainability Questionnaire, created for the purpose of this study, inspired by the MSCI list of the ESG criteria (MSCI, 2024), evaluating their personal attitudes towards the common sustainability-related issues (e.g. the choice of greener means of transport), as well as their perception of the FB's status in the main ESG areas. The third part of the questionnaire will be dedicated to addressing the sharing economy specificities (i.e. the application of the practice in their daily lives as well as their business decisions), which will help further evaluate their tendency to accept or reject sharing economy business models. The final, fourth part of the questionnaire will measure the psychological dimensions (i.e. one's identification with the firm and their commitment to it). The questionnaire measuring the employee's identification with the firm will be the 7-item Psychological Ownership Scale (Van Dyne & Pierce, 2004), and the questionnaire measuring their commitment to the firm the 15-item Organizational Commitment Questionnaire (OCQ; Mowday et al., 1979). The sample will be divided into groups based on the participants' generation, and correlation/regression analyses will be conducted on the collected data. Additional demographic differences in results will also be examined.

Discussion and conclusion

This study has been motivated by the authors' cooperation with several FBs around the world. We expect that the results of the survey could shed more light on the sustainable strategy creation practices in the family firms and help their consultants and other stakeholders understand what other strategies may be needed to help them seize the opportunity to make a difference by integrating ESG into their regular planning, in line with the recent sharing economy trends (Boar et al., 2020). Taking into consideration all previous research regarding the benefits of implementing ESG into a firm's practice, and the efforts that most family firms put into the protection of their business, legacy creation and continuation of the family's ownership (82%, 67% and 66% of firms globally, respectively; PwC, 2023), as well as the percentage of companies currently led by the members of the second or further generations (68%; PwC, 2023), it is in the firm's best interest to recognize the importance of ensuring sustainability in business, which is rather rapidly being taken over by the 'unapologetic' millennials. It is necessary for the decision-makers to realize that their current strategic top priorities have to include sustainability principles, and that in fact, these can help them achieve their goals in a more efficient way. While the results of the survey will certainly be limited due to small sample size, we hope they can inspire other authors to perform similar analyses in different regions, so a more culturally-sensitive approach can be established when working on the worldwide implementation of the ESG practices in family businesses, and businesses in general.

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Implementing a smart city in a developing country: The case of Guatemala City

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Abstract. *Technologies have become indispensable tools nowadays and their adoption in urban environments is essential for sustainable welfare. This holds particular importance in developing countries, which often face high demographic pressure and significant challenges in improving the quality of life of their citizens. Collaborative efforts in implementing smart-city initiatives have proven to be effective in enhancing the efficiency of urban services and driving economic development. Given Guatemala City's status as the most populous urban centre in Central America, and with the region experiencing rapid urbanization, its transformation into a smart city has become significant. This strategy will not only improve the well-being of its citizens but also offer valuable insights for similar urban settings, providing a relevant framework to evaluate its efficacy in uplifting welfare and competitiveness.*

Keywords. *smart cities, competitiveness, developing countries, Latin America and the Caribbean, Guatemala*

1 Introduction

Technological advancements have been the driving force behind great economic and social transformations throughout history; discoveries like gunpowder, the invention of the steam engine, and the use of electricity for industrial and domestic purposes are examples of breakthroughs that have marked turning points in human history, forever altering how humans interact with each other and their environment. Since the second half of the 20th century, a new technological revolution has emerged with the advent of digital computers and process automation, leading to what is known as the Third Industrial Revolution (Rifkin, 2018). This period has seen the systematization of daily activities and the widespread use of computers for households and individuals. The interconnection of different computing devices via the Internet has ushered in the era of information and communication, often described as the gateway to a new Industrial Revolution, characterised by significant advancements such as the rise of social networks, the Internet of Things (IoT), Big Data analysis, Artificial Intelligence (AI), or even Quantum computing, leading to increased dependency of human activities on technology and even blurring the boundaries between physical, virtual, and biological realities (Schwab, 2016).

The potential use of emerging technologies, with millions of people interconnected and having instant and unlimited access to all kinds of information, is simply immeasurable. The advancement of these technologies leads to the creation of new industries and types of jobs while others become obsolete and disappear. Technological advancements also lead to improvements in efficiency and productivity, providing a unique competitive advantage in a globalized world that can suddenly shift balances in markets, forcing companies and governments to adopt these tools and adapt swiftly to changes to keep their competitiveness. This is particularly crucial in developing economies, as technological adoption, while capable of generating wealth and new opportunities, can also exacerbate economic inequalities, especially in its disruptive potential in labour markets (Brynjolfsson & McAfee, 2014). Lack of access to technological tools at the speed they appear, as well as the educational gap in their adoption, can leave a population behind economically, directly affecting the quality of life of its inhabitants.

Major economic transformations often occur when technological advances converge with transcendent historical events. Currently, we live in the convergence of the digital revolution and the urbanization of the population worldwide. For the first time in history, the population living in urban areas surpasses the

population of rural areas, with Latin America being the second region with the highest level of urbanized population, only behind North America. However, almost all Latin American countries are considered developing economies (United Nations, 2014). The continuous growth of the world population, especially in urban areas, presents a significant challenge in developing efficient and sustainable cities, which generates the need and the opportunity to take advantage effectively of technological resources in urban planning, administration, and governance, especially in developing countries.

Being Central America the region with the greatest population growth rate in Latin America, the implementation of smart city initiatives in Guatemala City presents an interesting case to evaluate the effectiveness and applicability of this proposal in other developing countries that exhibit similar conditions and face similar challenges. Therefore, the following paragraphs will define the concept of a smart city and its scope, as well as the importance of its application in emerging economies. Subsequently, the smart city initiatives implemented in Guatemala City will be presented, and their effectiveness will be evaluated, as well as the areas of opportunity that still need to be addressed, to determine their applicability in other developing countries.

2 Smart cities in developing economies

The idea of a smart city has acquired increasing prominence in recent years, primarily in governmental circles and particularly at the municipal level; however, as it is an emerging concept, its definition is broad and admits various interpretations. In general terms, a smart city is one that effectively uses Information and Communication Technologies (ICTs) in urban management. Nevertheless, the scope of smart cities extends beyond merely providing urban services and encompasses strategic decision-making and governance of cities, efficiency in the operation of local governments and other public institutions, and initiatives that increase the level of competitiveness in cities (Bouskela et al., 2016). In addition to governmental use, the term smart city is also used commercially by companies that provide technological tools to public and private organizations that deliver urban services to the population.

Sustainability has recently been incorporated into the conception, meaning that smart cities are those that aim to satisfy the current and future needs of their citizens in economic, social, and environmental aspects (International Telecommunication Union, 2014). Smart cities focus on the economic and social well-being of their residents while ensuring the sustainable use of available resources for their preservation over time, positioning themselves as attractive hubs for external entrepreneurs and workers who seek security, quality of services, and employment opportunities. Technology in smart cities is employed to collect and analyse vast amounts of data generated constantly and in real-time to predict and mitigate urban problems, as well as to offer proactive solutions for their citizens. Even though, the implementation of these solutions must be conducted through orderly and systematic planning and management to ensure effective and quantifiable results, without losing sight of the primary goal of urban development, which is to improve the quality of life of people.

The adoption of technological tools must also be accompanied by the transformation of processes in public and private institutions responsible for the management and governance of the cities. The lack of inter-institutional coordination and integration represents one of the greatest challenges in implementing initiatives for the evolution of traditional cities into smart cities; hence the need for the commitment of the different stakeholders is required to integrate into the development of strategic projects since cities become smart only when the complex challenges that digital transformation entails are addressed comprehensively. The implementation of ICTs must be coordinated with a joint development strategy that considers the social, economic, and environmental spheres and the necessary transformations therein, incorporating projects that attempt to improve urban planning, infrastructure, and governance, and to foster sustainable and integrated development through collaborative planning processes and citizen participation.

The execution of transformation projects towards smart cities has been driven as a solution to the demographic pressure faced by many cities around the world and is an especially useful strategy in developing countries, which currently show the highest rates of population growth. Although smart city initiatives have been mostly implemented and studied in developed countries, it is in developing countries where innovative technologies have shown a greater impact on the operation of urban services, increasing productivity, competitiveness, and improving liveability in the cities (Antwi-Afari et

al., 2021). Working collaboratively, the modernization of cities has shown positive results in various fields, such as mobility and traffic, water and energy provision, waste collection, security and surveillance, and risk management, among others.

There is no doubt that creating smart cities is significant in addressing urbanization challenges, but at the same time, it is also necessary to consider the implications of implementing these initiatives, especially in developing countries. The main challenge often lies in financial limitations for technology investment, making it crucial to find sustainable financing models involving private sector participation and international cooperation. As well, many cities in developing countries lack adequate basic infrastructure and have significant digital gaps that need to be addressed. The absence of regulatory frameworks and clear policies for managing the volumes of collected information, especially regarding the privacy and security of personal data, raises concerns for users, pointing out the need for concrete regulations and measures for data protection and cybersecurity to ensure confidentiality and integrity of information. As discussed above, overcoming these challenges requires a comprehensive approach and long-term commitment from institutions as well as citizens.

3 The case of Guatemala City

Guatemala City is the capital of the homonymous country, which is located in a volcanic valley at 1500 meters above sea level. It has an approximate population of three million within its urban core, although its metropolitan area reaches an estimated five million people, making it the most populous and extensive urban agglomeration in Central America and the Caribbean (National Institute of Statistics, 2020). The city was founded 500 years ago and has been in its current location for almost half of that time, being its fourth settlement. The city was established in the middle of the volcanic mountain range that crosses the Central American isthmus, very close to the geological fault that marks the division of two continental tectonic plates, which added to the country's locations in the Caribbean Hurricane Corridor, makes the city highly susceptible to natural disasters, being these the cause of its successive relocations. However, these conditions have also favoured human settlement, since the valley where it is located has very fertile lands, abundant water sources, and a pleasant and temperate climate with stable temperatures throughout the year, considering its privileged location in the centre of the Americas and its proximity to the two largest oceans.

Central America is currently the second most rapidly urbanising region in the world. According to current urbanization rates, the urban population in Central America will double by 2050, accommodating over twenty-five million inhabitants (Maria et al., 2018). Being the most populous and extensive city, Guatemala City is the one that faces the greatest demographic pressure and, consequently, the one that ought to prepare and adapt the most to host this population growth and provide better urban services to its future inhabitants, ensuring the proper and sustainable use of resources. The strategic plans that are implemented in the coming years will settle the level of human development and economic growth the city will achieve, as well as its competitiveness as a global city. Therefore, the implementation of strategies to transform Guatemala City into a smart city results more than evident, while it also provides an excellent opportunity to study its application in other cities with similar conditions and challenges, primarily in the Latin American region.

Due to the demographic explosion since the second half of the 20th century, several plans and policies have been launched to promote the economic and social development of Guatemala City and its metropolitan area. Since the end of the century, efforts have been made to integrate the surrounding municipalities into a common metropolitan area, developing joint strategies to carry out programs that improve the public transportation system and urban mobility, water management, waste collection, and civil security, among others. Likewise, efforts have been made to involve the private sector in these plans to develop public-private alliances that aid in the financing and execution of these programs. However, most of those proposals have been carried out as separate initiatives without a concrete plan.

The first integral proposal to formulate a centralized policy that sought urban development emerged in the first decade of 2000, which focused on efficient attention to urban demands through a multi-sectorial process to apply rules and regulations effectively and direct territorial planning actions for sustainable development. In this framework, the first action was the development of a Territorial Development Plan and subsequently the implementation of other projects, just as a new bus rapid transit (BTR) system

called "Transmetro", a municipal ecological belt, digitalization of paper archives and a one-stop shop for citizen services. In 2010, a major transformation process began with the integration of all IT systems into a single local-based (currently cloud-based) management platform, which laid the foundations for the development of new digital projects.

In 2014, the Municipality of Guatemala organized the contest "Creating a Smart City" for the design of digital applications that facilitate access to public services, and two years later formulated the plan "Guatemala, Smart City", which encompasses several development projects that were already underway, such as the expansion of the public transportation system and the placement of video surveillance cameras, along with other digital transformation and e-governance programs, to steer their implementation towards the development of a smart city (Román, 2024). Within this framework, three projects are currently being implemented: the expansion of Transmetro lines and the creation of the TuBus system, for which a zero-emission electric line is being incorporated, the development of smart traffic lights and smart parking meters to improve urban mobility, and, finally, the implementation of a citizen card to simplify the payment of urban services in a unified electronic system.

The technological initiatives to transform Guatemala City into a smart city have benefited an estimated three million people in the metropolitan area and have trained more than a thousand municipal workers and citizens in the use of electronic systems. The digitalization of procedures has standardized more than 300 processes and automated 480 activities in total, which, together with the expansion of online services and the implementation of an electronic payment platform, has allowed public income to increase by 30% (Román, 2024). These changes have also speeded up the provision of services, reducing processes that previously took days to just minutes. For the coming years, the projects planned are the rehabilitation of the railway line for the construction of a tram system on the North-South axis, the creation of an aerial metro system on the East-West axis, the expansion of bicycle lanes around the city and the creation of a garbage sorting line in the municipal dump, which are being promoted through joint work between the public and private sectors.

The path that Guatemala City must traverse to become a smart city is still long since there are still areas where insufficient progress has been made, such as water treatment and waste management, requiring actions from the responsible institutions to address them promptly. Possibly the greatest challenge that the city currently faces is its inter-municipal integration, as effective adoption of new technologies and processes requires cooperation from all municipalities within the metropolitan area to expand the scope of these initiatives. Political will in policymaking is key for the coordination and implementation of development programs, as well as for conducting further studies to measure results and provide strategic guidelines for continuous improvement and sustainability. However, some recent projects have been promoted through inter-municipal alliances as an attempt to unify the programs to benefit the entire metropolitan area. The journey thus far has helped raise levels of welfare and competitiveness, and the prospects for Guatemala City as a smart city in Latin America are promising.

4 Conclusion

We are at a critical moment in history, at which ICTs have become essential tools for carrying out all human activities, and their adoption in cities is decisive for the sustainable well-being of their inhabitants. This is particularly important in developing countries since they usually face greater demographic pressure and greater challenges in improving the quality of life of their populations. By working collaboratively, the implementation of smart city initiatives has proven to be an effective strategy for improving efficiency in the delivery of urban services and managing projects that promote greater economic development and competitiveness. As Guatemala City is the most populous and extensive urban agglomeration in Central America and the Caribbean, and it is the second most rapidly urbanising region in the world, the implementation of strategic proposals for its transformation into a smart city is a significant necessity to ensure the economic and social well-being of its citizens.

Since the beginning of this century, the Municipality of Guatemala has led most of the initiatives of integral urban development, consolidating them in 2016 with the plan "Guatemala, Smart City", which provides a unifying framework for several multidisciplinary projects conducted with the vision of creating a functional and sustainable smart city. The results of these projects have been positive, and millions of citizens have benefited from them; however, most of these projects have focused on urban security and

mobility, which were the most urgent problems, but still few results have been achieved on the management of resources and sustainability. Likewise, it is still necessary to promote these projects in the entire metropolitan area of the city, for which the integration of all municipalities must be a priority, and to involve the private sector in developing public-private alliances that aid in the financing and execution of the initiatives.

The research conducted on the actions taken by Guatemala City for its transformation into a smart city provides an interesting framework for its implementation in developing economies since the adoption of electronic tools through a unified plan with a single vision has provided positive results in increasing the level of citizen well-being and the competitiveness of the city, ranking it as an attractive emergent city in Latin America to live and invest in, despite having some structural problems that have not yet been addressed. However, it is necessary to expand research on the results of programs and projects since more measurements are needed to evaluate their effectiveness, especially in municipalities within the metropolitan area that lack many of them. Likewise, it is recommended to compare the results obtained by the city of Guatemala with other emerging cities outside Latin America, to better identify the initiatives that generate the greatest impact. The results obtained will provide a proper reference framework to demonstrate the effectiveness of smart cities and complement it with other programs aimed at raising the welfare and competitiveness levels of the population.

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The Power of Sharing in Disaster Management: Insights from a Bibliometric Review

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Abstract. *For all of history, mankind built their cities in disaster-prone areas - the foothills of volcanoes with their fertile ground, the deltas of rivers that provided transport and fishing possibilities, but also earthquakes and floods. With changing weather patterns and climate change, natural disasters will only be more frequent and severe than they have ever been before. When disaster strikes, all people are one, no matter the economic or educational background, and no matter the state borders. In these times, the sharing economy must play a significant role in providing disaster relief and helping survivors. In this paper, a bibliometric analysis is conducted with the aim of exploring the evolving landscape of the sharing economy's role in disaster management. The authors of the study conducted a review of the literature throughout time to pinpoint important themes, trends, and research gaps. The objective was to furnish a comprehensive synopsis of the existing theoretical and empirical understanding in researched field. This was accomplished through descriptive qualitative investigation of Web of Science-WoS database documents.*

Keywords. *Sharing, sharing economy, disaster management, bibliometric analysis, SDGs 1 Introduction*

1 Introduction

Throughout human civilization, natural disasters have consistently had a profound impact on society's development and the way humans perceive catastrophic events and the entire life of the human community. Natural disasters have significantly influenced the course of human civilization across different historical periods. Their influence has impacted population migrations, the strengthening of religious, and the progress of science. "It should be pointed out that throughout history, natural disasters have represented an integral part of the life on Earth for millions of years, and that we, as a civilisation, have incessantly faced a destructive influence of the earthquakes, volcanoes, floods and various epidemics" (Petrović et al., 2017, p. 28). And when such disasters occur, which leave behind devastation in lost lives, damaged ecosystems, and destroyed infrastructure, governments and all societies put all their resources into repairing these catastrophic consequences. In these cases, therefore, the key role can be seen in collaboration, or rather collaborative economy or sharing economy (SE), too. The reason lies in the resulting situation which becomes especially critical when addressing and reacting to disruptive disasters, as the element of urgency introduces an additional layer of complexity. "Such collaboration is particularly urgent when coping and responding to disruptive disasters, because they have the added complication of urgency" (Guerrero et al., 2023). In addition, the role of SE is highly ecologically sustainable (Hamari et al., 2016; Prothero et al., 2011).

Lately, there has been an increasing interest in the implementation of an adequate model of SE with the aim of improving disaster response and recovery operations. Through the utilization of existing platforms specifically built for the purpose of sharing resources, community members can offer essential assistance to individuals impacted by emergencies. Both federal and certain local governments are currently conducting thorough investigations into the potential of SE, since Hurricane Sandy (October

22, 2012 – November 2, 2012), when accidentally the role of SE in disaster response was tested (Government Technology [GT], n.d.).

With all the above in mind, the authors of the paper conduct a literature review of studies on the role of SE in disaster management with the aim of emphasizing the significance of SE in effective disaster response, recovery, and management, as well as potential research gap in this field.

2 SE and Disaster Management

The notion of the SE has garnered considerable interest in recent years, not just among researchers and academia but also among “decision-makers, media, and other stakeholders” (Petrović et al., 2022). “The SE enables sharing goods, services, ideas, information, and skills through a network of individuals, facilitated through social networks and websites via computers, mobile applications and other information systems over the Internet” (Hu, 2019; Seddighi & Baharmand, 2020).

When it comes to disaster management, it must be emphasized that it represents “a process of effectively preparing for and responding to disasters. It involves strategically organizing resources to lessen the harm that disasters cause. It also involves a systematic approach to managing the responsibilities of disaster prevention, preparedness, response, and recovery” (Tulane University, 2022).

It can be said that the role of the SE is of particular importance in the response and recovery phases, whether it involves providing accommodation, transportation, sharing, volunteer work, sharing information for those at risk, and especially vulnerable populations as pointed out the authors Wong et al. (2020). For example, “the exchange of relevant information is critical in the immediate aftermath of a major disaster” (Bjerge, 2016).

Based on the review of the literature, as well as past practices during catastrophic events, the authors Seddighi and Baharmand (2020) have compiled Table 1. Table 1 shows the prospective participation of the various SE companies in disasters and disaster management: *Airbnb* as a platform for sharing accommodations; *Uber*, *Lyft*, and *Waze*, which provide transportation services; *Walk Score* as a platform that assesses walkability and suggests possible lodgings; and *TaskRabbit*, which links freelance labor with various local demands such as personal help, furniture assembly, moving, delivery, and handyman services.

Table 1. The possible engagement of the different SE companies in disasters and disaster management (Source: Cheng, 2016; Ganapati & Reddick, 2018; Hamari et al., 2016; Kornberger et al., 2018; Seddighi & Baharmand, 2020)

Activity	Airbnb	Lyft	Uber	Waze	Walk Score	TaskRabbit
Accommodation provider	✓					
Transportation provider		✓	✓	✓		
Volunteer management			✓		✓	✓
Information sharing					✓	✓

The different roles of the SE in disasters and disaster management could be from offering logistic activities and services, coordination of information especially among affected and people from

vulnerable groups, with emphasizing “effectiveness, efficiency, sustainability, and flexibility” (Seddighi & Baharmand, 2020).

3 Methodology

For the purpose of the research, a qualitative analysis of the papers in the Web of Science (WoS) database was performed. Analyzing bibliometric indicators served as the method of research. The selection of bibliometric analysis as a research approach is based on its widespread usage and its suitability for managing huge amounts of scientific data.

The paper performed a bibliometric analysis, analyzing the topics of the publications - titles, abstracts, and author keywords. The bibliometric analysis was carried out on the WoS database, which is characterized by the content of high-quality data and the wide scope of represented scientific areas. This database has access to more than 34,651 journals, books, proceedings, patents, and data sets (Clarivate, 2024).

4 Discussion and Conclusion

In their research, the authors of the paper used scientific mapping to facilitate the examination and evaluation of the connections among the studied elements. The co-word approach was employed. The search sample had the terms “*sharing economy*” (the inclusion of quotation marks) AND the associated keyword “*disaster management*” (the exclusion of quotation marks). A total of seven results were obtained, indicating a rise in the number of publications throughout the years (Graph 1).

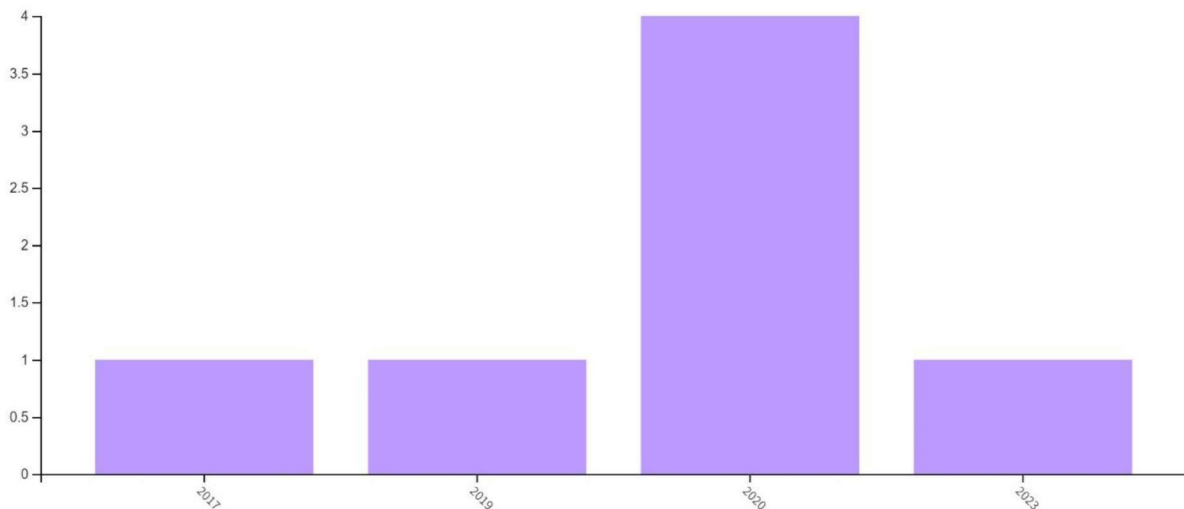


Figure 1. Publications in which the keywords “*sharing economy*” AND “*disaster management*” appeared, published from 2017. – 2023. (Source: Authors’ work)

As it can be seen from Graph 1, publications in the field of SE and disaster management are few and showed a tendency to grow in 2020, the year when there were the most of them. (The rise in the number of publications might be due to the following grave disasters in 2020: Hurricane Eta killed at least 150 people in Central America. Deaths were recorded in Honduras, Guatemala, Mexico, El Salvador, Panama, Nicaragua, and Costa Rica. The Australian bushfires killed at least 478 people). All of them (100 percent) were articles, published in English.

The research areas of publication were particularly interesting to the authors of the paper. They are:

- Social Sciences Other Topics - 57.143% of all papers.
- Transportation - 28.571%.

Engineering / Environmental Sciences Ecology / Information Science Library Science / Social Issues - each one 14.286%.

What can be noticed is that there are no papers published in the journals in the scientific fields of disasters, disaster management, environmental risk, sustainability, and SD. When it comes to the connection of publications with sustainable development goals (SDGs), the link is only with the following SDGs:

- SDG 8. Decent Work and Economic Growth - 14.286% papers;
- SDG 9. Industry Innovation and Infrastructure - 14.286% papers;
- SDG 11. Sustainable Cities and Communities - 14.286% papers; and
- SDG 13. Climate Action – 14.286% papers.

Having in mind that SE also directly affects SDG 12 and SDG 16 (e.g., Pérez-Pérez et al., 2021; Petrović et al., 2022), and disaster management is related to 10 of the 17 SDGs (above mentioned plus SDG 1 - SDG 4, SDG 6, SDG 14 - SDG 15) (UN Office for Disaster Risk Reduction [UNDRR], n.d.), it is reasonable to assume there is a lack of publications in the area of the achievement of all relevant SDGs.

In the end, the authors of the paper conclude that the connection between SE and disaster management, which is evident in practice, is unfortunately not followed by an adequate number of published scientific and academic research studies, as well as by authors Seddighi and Baharmand (2020), who claimed that their “findings indicate that very few studies discuss the different roles of SE in disasters, although SE companies have often provided effective solutions to address critical post-disaster logistics challenges.” This leaves a lot of room for further research in this critical field.

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Towards Sustainability: A Quintuple Helix Approach in the Circular Economy Framework

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Abstract. The combination of innovative technological solutions with the natural ecological frameworks of our planet offers a crucial path towards sustainable development goals (SDGs) delineated in The 2030 Agenda for Sustainable Development, as well as the transition to a circular economy (CE) with the adoption of the principle of circularity and natural-based business models. As we navigate the challenges of sustainable advancement, it must be pointed out that innovation's crucial role in accomplishing the SDGs. The Quintuple Helix Model and the SMART Quintuple Helix System offer an innovative framework for encouraging innovation that need to be closely interwoven with sustainable development activities. These models underscore the necessity of a collaborative approach involving academia, industry, government, civil society, and environmental considerations to address the complex challenges of today necessary transition to the CE.

Keywords. Quintuple Helix Innovation Model, SMART Quintuple Helix Innovation System, Sustainable Development Goals, circular economy *1 Introduction*

1 Introduction

Earth is the only planet we know that can sustain life, thanks to its unique combination of natural conditions that support a diverse range of life. The intricate balance between the atmospheric, geophysical, and hydrological systems, which together produce a favorable habitat for a variety of living forms, gives the planet its unique characteristics. Fundamental to Earth's ability to sustain life is the dynamic interaction between these systems, which operate within an intricate net of interdependencies.

Acknowledging the importance of sustainable development (SD), it becomes even more important to put in place a strategy that carefully balances human ambitions with the planet's intricate natural processes. To effectively address the issues raised by the SDGs, human civilization's further development needs to reflect a thorough understanding of these thin interdependent connections with the aim of safeguarding Earth's unique ability to nurture life for future generations through the application of scientific knowledge and responsible sustainable practices. The overwhelming scientific consensus underscores the urgent need to confront sustainability challenges, lending significant weight to our collective pursuit of innovative and collaborative solutions.

The CE as a model is on the way to meeting the environmental protection, sustainability practices, and SDGs, having in mind that “the application and transition to a CE reduces the depletion of natural resources, reduces the amount of waste generated, reduces the amount of waste in landfills and thus the consequent pollution of water, air, and land, global warming, land destruction, as well as improved energy efficiency and raise of use of renewable energy sources” (Petrović et al., 2023, p. 6). In this approach, CE as well as the sharing economy (SE) maintain natural resources for the benefit of people and the Earth, rather than substituting resources with human capital (Henry et al., 2021).

The assumption of the European Commission and numerous national administrations that innovations among current businesses and entrepreneurs are an important driver in switching from a linear economy to a CE (Hofmann, 2019), is putting in line with CE the concepts of the Quintuple Helix Innovation Model,

and Smart Quintuple Helix Innovation System. They represent an advanced frameworks for fostering innovation (Carayannis & Campbell, 2018) that is deeply integrated with SD, especially in the context of achieving SDGs (König et al., 2021).

In the paper, the authors conducted a review of existing literature with the aim of highlighting the importance of the Quintuple Helix Approach in the context of CE, with the necessary connection to the achievement of SDGs, but also to indicate future development of models and systems in this area.

2 A Quintuple Helix Approach, Sustainability and CE

Sustainability has been operationalized through the United Nations' (UN) 17 Sustainable Development Goals (George et al., 2016). At a historic UN summit held on September 25, 2015, 193 UN member countries adopted a set of 17 goals as part of the new Sustainable Development Agenda (Transforming our world: the 2030 Agenda for Sustainable Development). These goals, along with their 169 specific targets, are set to be achieved by the year 2030, and all in pursuit of establishing a just and sustainable society that benefits all individuals. It must be noted that “the transformation into a sustainable society requires new challenge-driven innovations and new collaborations between more actors than earlier from different spheres in society with a variety of knowledge and practices, including civil society” (Grundel & Dahlström, 2016).

According to König and others (2020), the Helix Models of Innovation are pivotal for understanding the integration of SDGs within the framework of industry, innovation, and infrastructure. This understanding is built upon foundational work by Leydesdorff and Etzkowitz (1996), Carayannis and Campbell (2009, 2010), and Carayannis et al. (2012), who explored the dynamics of knowledge production and innovation ecosystems. König et al. (2016) reference initiatives by UNESCO/IFAP & UNU-EGOV that underscore the importance of socio-environmental transitions for SD within these models.

Furthermore, in the academic and professional realms, the term “SMART” is commonly adopted as an acronym to delineate the attributes of effectively structured objectives. As outlined by the authors Carayannis and others (2022) in their discussion on *Smart Environments and Techno-centric and Human-Centric Innovations*, the acronym stands for goals that are: *Specific* (focused on a particular area for enhancement), *Measurable* (providing a way to gauge progress, whether through quantifiable metrics or indicative markers), *Achievable* (realistic in terms of what outcomes can be attained), *Relevant* (aligned with overarching strategies and goals), and *Time-bound* (clearly defining a timeline for achieving the results).

This framework, rooted in earlier analyses by Frey and Osterloh (2002) and Dezi et al. (2018), emphasizes the importance of precise, assessable, feasible, pertinent, and timely objectives in driving meaningful advancements within Industry and Society 5.0, underpinning the move “towards smart, sustainable, and inclusive solutions” (Mabrouki, 2023). This model builds upon the Quintuple Helix innovation model by incorporating “smart” technologies and practices, emphasizing a systemic approach to innovation that involves “collaboration among five key stakeholders: academia, industry, government, civil society, and the environment” (Carayannis & Campbell, 2018).

Based on the research of the authors Barcellos-Paula et al. (2021), Table 1 shows the evolution of the theoretical Quintuple Helix Innovation Model and the Smart Quintuple Helix Innovation System.

Table 1. Evolution of the theoretical Quintuple Helix Innovation Model and the Smart Quintuple Helix Innovation System (Source: Barcellos-Paula et al., 2021)

Typologies	First Definition	Scope and Approaches of the Proposals
Quintuple Helix Innovation Model	In addition to describing five knowledge subsystems (helices), this model places significant emphasis on the environment as a determinant in the decision-making process. Knowledge is of utmost importance in	The objective of this model is to encourage innovation endeavors that aim to create socio-ecological interactions through the dissemination of knowledge from the subsystems (helices). The core principle of this model

	<p>this model as it facilitates the generation and modification of innovations that stimulate the exchange of information between subsystems.</p>	<p>centers on the ecological consequences and aims to foster consciousness regarding the accountability of societies with respect to this matter.</p>
<p>Smart Quintuple Helix Innovation System</p>	<p>Innovation and the interactions of five subsystems that exchange knowledge to generate and promote SD form the foundation of this theoretical model. Political capital, educational capital, economic capital, environmental capital, and social capital comprise the subsystems.</p>	<p>This conceptual framework represents an extension of the triple helix, wherein pertinent actors are represented as knowledge subsystems. It commences with the formulation of innovative initiatives and proceeds with the ideation of a quest for developing countries. Every capital has a distinct function for which the surrounding environment is vital. Similarly, media channels, social capital, and social networks all play crucial roles in the formation of opinion matrices through which society can “audit” the decisions of other actors.</p>

The authors Carayannis et al. (2012), as well as Barcellos-Paula et al. (2021), proposed that SD must be in the center of the of the Quintuple Helix Innovation Model (Figure 1).

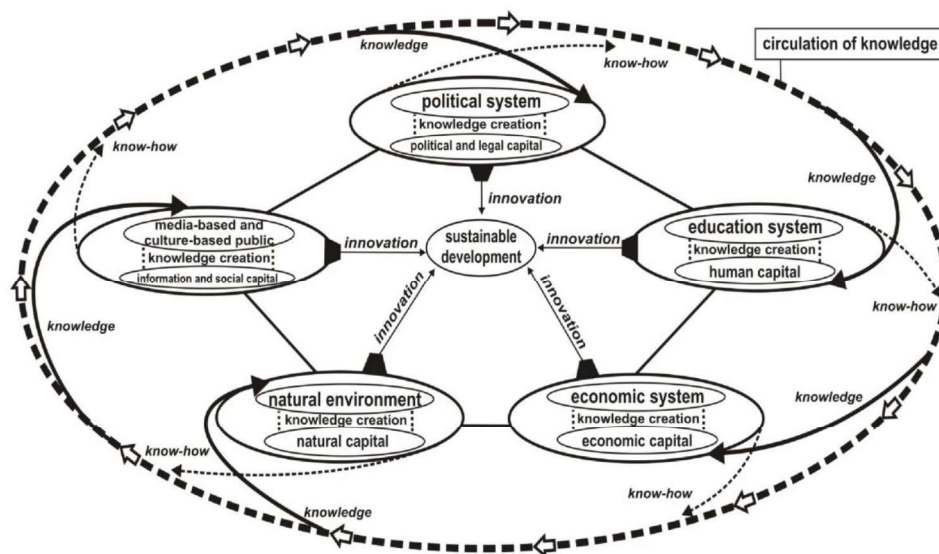


Figure 1. The Quintuple Helix Innovation Model (Source: Barcellos-Paula et al., 2021; Carayannis et al., 2012)

The problem-oriented quintuple helix innovation system seeks to serve as a means of achieving socioecological transformation, or the conversion of society to a bioeconomy or a CE and hence towards sustainability (Carayannis et al., 2012). When it comes to CE, the authors Durán-Romero et al. (2020) proposed that CE and eco innovations must be in the middle of the Quintuple Helix Innovation Model (Figure 2) because they claimed that “CE arises in the middle of the innovation system and plays a key role in achieving decarbonization objectives” (Durán-Romero et al., 2020).

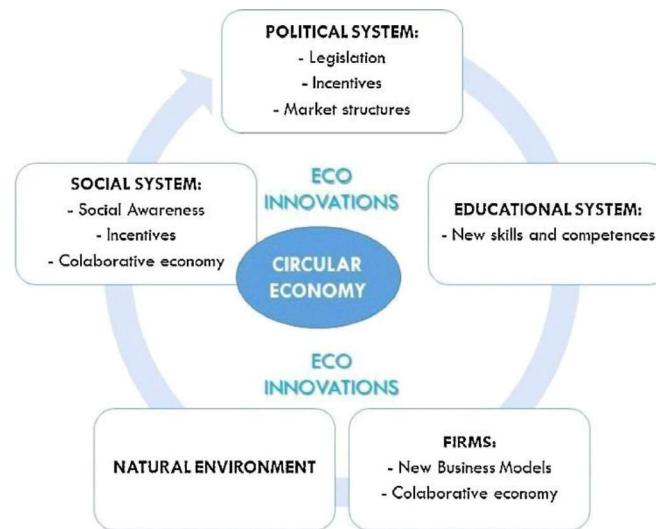


Figure 2. Relating the Quintuple Helix Innovation Model with the CE and eco-innovations (Source: Durán-Romero et al., 2020)

4 Discussion and Conclusion

Although many studies have indicated that helix models provide substantial advantages, particularly in the realms of entrepreneurship, innovation, and connections with nature – many research gaps still remain: (Malik et al., 2021):

“There is no clear understanding of how helices interact with each other.

There is little evidence of how a temporal interaction between these helices influence the dynamics of innovation at a firm level.”

The solution and path for future study may lie inside the Smart Quintuple Helix Innovation System, which plays a crucial role in facilitating transparent, sustainable, and circular progress, because when it comes to “smart” technologies, such as IoT (Internet of Things) devices, AI (Artificial Intelligence), and blockchain, it must be noted that they can optimize resource use and minimize waste, and enable smarter energy management systems that mimic the natural balance of ecosystems. These technologies facilitate real-time data collection and analysis, informing policy and business practices to align with SDGs and goals and principles of CE. It must be noted that “digital SE platforms relate to CE” (Henry et al., 2021). “Smart” practices involve collaborative efforts across all helices, fostering a culture of co-creation and shared responsibility that reflects the mutual dependencies found in nature (Abiri et al., 2023; Bibri et al., 2024; Chen et al., 2023; Dhanaraju et al., 2022).

This comprehensive approach not only mirrors Earth's complex ecological systems but also serves as a foundational blueprint for navigating the multifaceted challenges posed by the SDGs, illustrating a systemic approach where innovation and environmental stewardship converge to secure a sustainable future for all.

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Shared Urban Mobility as a Part of Shared Economy

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Abstract. *The purpose of the paper is to provide a global overview of the sharing economy and shared mobility, while the aim of the paper is to analyse the relevant literature in the field of shared mobility and to determine key domains shared mobility services. The sharing economy encourages joint use of resources, which changes traditional economic paradigms. Focused on values essential to life, it empowers mindful and financially constrained consumers. Car sharing in Europe demonstrates reduced user kilometres, while bike sharing globally grows rapidly. The sector's evolution signifies a fundamental shift in resource allocation, reducing reliance on privately-owned vehicles and enhancing overall sustainability. With over 10,000 companies operating, shared mobility is a pivotal force transforming urban transportation paradigms, projecting a 12.2% Compound Annual Growth Rate (CAGR) and a 32% revenue share for Europe.*

Keywords. *Shared economy, shared mobility, transportation, urban mobility*

1 Introduction

Urban mobility is an essential element of modern city life, with a function that has never been more significant in shaping the design of cities and the overall standard of life. A revolutionary idea in the world of urban transportation is shared mobility, which is the cooperative use of a variety of vehicles, such as automobiles, bicycles, electric scooters, and more. Essentially this idea supports shared ownership, accessibility, and environmental, economic, and sustainable practices. It also places specific emphasis on reducing transportation congestion, particularly in highly populated urban areas. Integrated within the broader concept of "transportation between individuals," shared mobility is a crucial part of the shared economy. With a significant effect, the shared economy gives consumers the ability to manage their time, money, resources, and experiences in general with skill. Driven by the growth of technology, the shared economy and its transportation-related industries have seen exponential increases in their worth and importance. The emergence of the sharing economy and the current technological revolution have made it possible to use transportation resources more effectively, which has helped to solve the problem of sustainable mobility in metropolitan areas. Using platforms for carpooling, bike sharing, vehicle sharing, and the increasingly common e-scooter sharing has today become incredibly easy. The integration of technology and shared mobility principles not only improves accessibility but also makes a substantial contribution towards solving the complex problem of sustainable urban transportation.

2 Shared Economy

The sharing economy is acknowledged as a transformative socio-economic system that poses a significant challenge to conventional economic paradigms, primarily centered around hyper-consumption and individual ownership (Miguel et al., 2022a). It serves as an alternative economic sector founded on values integral to the fundamental aspects of life. This conceptual framework empowers considerate and financially constrained consumers to efficiently manage their time, resources, finances, and experiences. Through mechanisms like exchange, gifting, trading, and lending, the sharing

economy offers an avenue to mitigate resource loss and waste, a critical need in the contemporary world (Vidan, 2023).

The sharing economy encompasses over 10,000 companies, and the revenue potential of this sector is anticipated to rise to \$335 billion by 2025 (Miguel et al., 2022b).

A report commissioned by the European Commission categorizes the principal activities of the sharing economy into five distinct sectors (Vidan, 2023):

- accommodation between individuals
- transportation between individuals
- on-demand household services
- on-demand professional services
- collaborative financial services

The sector of transportation between individuals encompasses mutual transportation services, vehicle rental, and parking. Digital platforms in this domain facilitate both short and long-distance transport services, serving as mediums for sharing vehicles among individuals, companies, and consumers. Two overarching categories of platforms exist within this sector. The first category facilitates the rental of assets like cars, motorbikes, and bicycles, with examples such as ZipCar, EasyCar, car2go, Avant2Go, ShareNow, and stadtmobil. The second category assists users in renting assets along with associated labor and human capital, with examples including BlaBlaCar, Sidecar, Uber, and Lyft (Petropoulos, 2017).

As per Market.us projections, the Shared Mobility Market is anticipated to exceed approximately USD 817.4 billion by 2032, with an expected Compound Annual Growth Rate (CAGR) of 12.2% from 2023 to 2032, as shown in Figure 1.

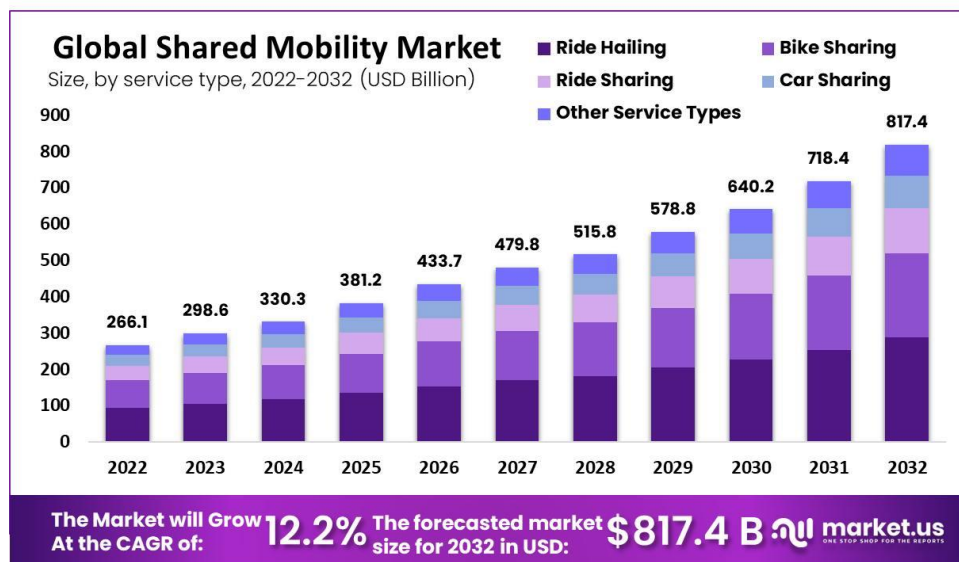


Figure 1 Expected market grow for shared mobility (Source: Market.us (2023))

3 Shared Urban Mobility

Shared mobility can be defined as the shared use of a vehicle, bicycle, or other means that allows users to have short-term access to modes of transport on demand (Bonaldo, 2021). It can be also described as a strategy that encourages the joint use of different types of transport for the purpose of sustainable travel.

Those transport options are (Shaheen et al., 2017):

- carsharing

- shared micromobility
- bike-sharing
 - e-scooter sharing
 - carpooling
- on-demand ride services
 - taxi
 - ridehailing
- ridesharing
- courier network services.

Figure 2 categorizes the fundamental facets of shared mobility according to the type of service rendered. Shared vehicle usage is facilitated by services falling under carsharing, scooter sharing, and bikesharing. Shared passenger journeys are supported through ridesharing, on-demand ride services, and micro transit. Utilization of private vehicles for delivery trips is made possible by courier network services. Each of these categories is further subdivided into distinct models. Carsharing comprises three business models: roundtrip, one-way, and personal vehicle sharing. Personal vehicle sharing (P2P) is further classified into four types: P2P Carsharing, Hybrid P2P Traditional Carsharing, P2P Marketplace, and Fractional Ownership. The business models for Bikesharing include Public Bikesharing, Closed Campus Bikesharing, and P2P Bikesharing. Ridesharing is divided into Carpooling and Vanpooling. On-Demand Ride Services encompass Ridesourcing, Ridesplitting, and E-Hail. Microtransit is categorized into Fixed Routes and Fixed Scheduling, as well as Flexible Routes and Flexible Scheduling. Finally, Courier Network Services are segmented into P2P Delivery Services and Paired On-Demand Passenger Ride and Courier Services.

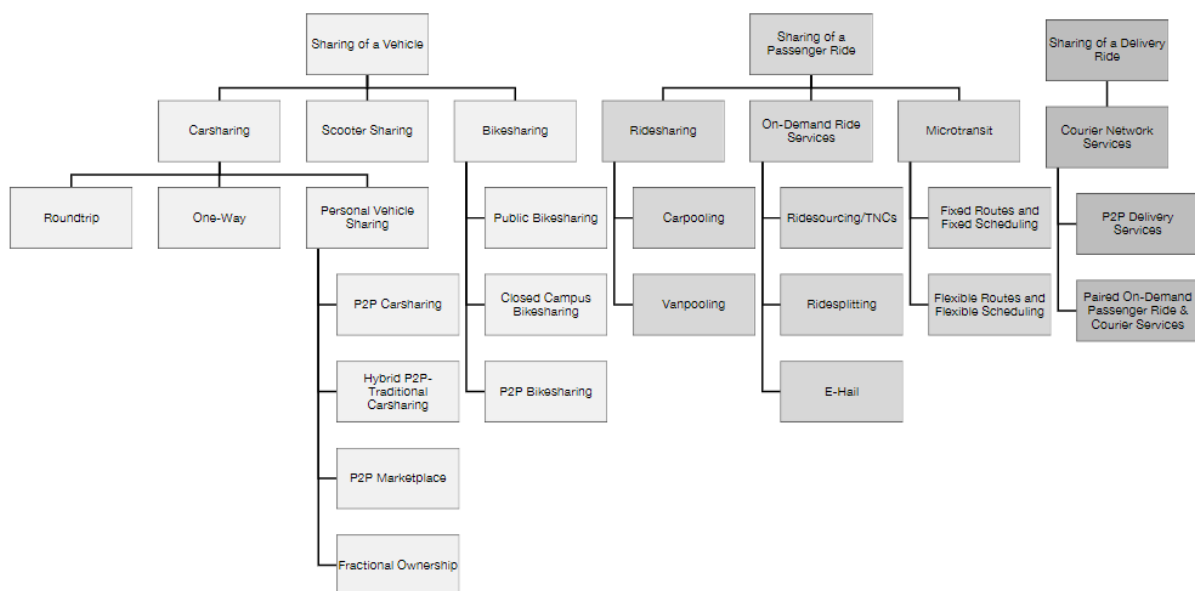


Figure 2 Key domains in shared mobility (Source: Shaheen et al., 2017)

Carsharing in Europe reduces user kilometers traveled by 28-45%, with a 45% reduction in Paris and 30.6% in London. Studies show variations in travel behavior, with carsharing users in the Netherlands either decreasing annual driving distances by 1750 km or increasing them by 1850 km depending on how people change their travel behavior. Although the environmental benefits are not the main reason to use carsharing services, it is seen as a by-product of using it. Some studies point out that on

carsharing in Europe the average CO₂ of the carsharing user were reduced by 39 to 54% (Bonaldo, 2021).

Bike-sharing has emerged as one of the fastest-growing transportation innovations in many global cities. As of April 2016, there were 1,019 cities with information technology (IT)-based public bike sharing systems in the world comprised of 1,324,530 bikes, the majority of which were in China. The U.S. had 75 programs spread over 99 cities, with approximately 32,000 bikes and 3,400 stations ().

The quantity of shared e-scooters in Europe experienced a growth of over 100% from 2021 to 2022, surging from 285,000 to 700,560 units by the conclusion of 2022. According to MMfE's report, the volume of e-scooter journeys on the continent witnessed a remarkable 17-fold increase, soaring from 14 million in 2021 to surpass 240 million in 2022 (Pinheiro, 2023).

Table 1 displays the present market valuation in 2022 and the anticipated market size in 2032 for Shared Mobility. The projection suggests that Shared Mobility is poised to more than double during this period, with an expected Compound Annual Growth Rate (CAGR) of 12.2%. Notably, Europe is anticipated to contribute significantly with a revenue share of 32%.

Table 1. Europe's market as a part of global shared mobility (Source: Market.us (2023))

Report Attributes	Details
Market Value (2022)	\$266.1 Billion
Market Size in 2032	\$817.4 Billion
CAGR (2023 to 2032)	12.2%
Europe Revenue Share	32%

*CAGR – Compound Annual Growth Rate

4 Conclusion

The sharing economy stands as a practical response to multifaceted challenges, particularly within the domain of urban transportation. It underscores the collaborative use of resources, moving away from ownership-centric models and facilitating efficient time and resource management. In the realm of mobility, the sharing economy is poised to bring about a fundamental shift in resource allocation, reduce reliance on privately-owned vehicles, and enhance overall sustainability. The current landscape encompasses a multitude of entities, surpassing 10,000 companies, with an anticipated sectoral revenue nearing \$335 billion by 2025, highlighting its significant economic impact. The European Commission's categorical taxonomy identifies five primary sectors within the sharing economy. Foremost among them is the realm of shared accommodations, exemplified by platforms like Airbnb. Simultaneously, the burgeoning sector of transportation between individuals includes dynamic services such as carsharing, bike sharing, carpooling, and the emergent e-scooter sharing model. Projections indicate that the Shared Mobility market is on a trajectory to reach approximately \$817 billion by 2032. Notably, the market valuation in 2022 amounted to \$266 billion, reflective of an impressive surge nearing 300% over a decade. The anticipated Compound Annual Growth Rate (CAGR) stands at 12.2%, with Europe commanding a substantial market revenue share of 32%. This underscores the empirically grounded evolution of shared mobility, positioning it as a pivotal force in transforming urban transportation paradigms.

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Digital Challenges in the Social Economy: Gender-Egalitarian Practices & FLOSS

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Abstract. *The COVID-19 pandemic has accelerated the digital revolution, particularly with the rise of the platform economy. The social economy sector is also impacted by this phenomenon and holds potential to foster pro-social digitalization models. This article investigates the adoption of platform business models within the social economy, focusing on professionalization, integration of Gender-Egalitarian Practices, and the embrace of open knowledge and software. The study analyzes twenty-seven social economy entities in Barcelona, using data from an online questionnaire, semi-structured interviews, web observation, and follow-up notes. Findings reveal challenges in digital platform model adoption, including limited evaluation of impact and organizational models that inadequately integrate gender perspectives. Additionally, obstacles exist in adopting Free/Libre and Open Source Software (FLOSS) tools.*

Keywords. *Social Economy; Digitalization; Platformisation; Gender-Egalitarian Practices; FLOSS*

1 Introduction

The COVID-19 pandemic accelerated the growth of platform-mediated work (Directorate-General for Communications Networks et al., 2021; ILO, 2021), driven by technological advancements and impacting various economic sectors, with diverse models and implications (Scholz, 2016; Srnicek, 2016; Poell et al., 2019). The pandemic also underscored digital inequalities (Allmann, 2020; Czymara et al., 2021), including gender-based violence in digital contexts (EIGE, 2022; Vergés Bosch & Gil-Juarez, 2021).

Focusing on social economy projects in Barcelona, this article analyzes how social organizations, grounded in democratic values and practices (Garcia Jane, 2017; Laville, 2016; Scholz, 2016), are responding to the digital revolution, particularly within the platform economy (Benkler, 2006; Codagnone, 2022; Parker et al., 2018). It discusses how these social enterprises, aligned with European Commission objectives (2021), address challenges related to equality (EIGE, 2021; UN Women, 2020; UNFPA, 2020) and promote pro-social models of digitalization. This includes prioritizing gender-equalitarian practices (EIGE: What Is Gender Mainstreaming, 2023) and adopting Open Knowledge and Free/Libre and Open Source Software (FLOSS) (Perry & Fitzgerald, 2006) as alternatives to extractive platforms (Srnicek, 2016). In Catalonia, for instance, 96% of social organizations recognize the imperative of digital transformation (M4social, 2022).

The social economy is characterized by small-sized entities (Sanchis Palacio & Campos Climent, 2007), contributing to lower levels of digital training. Moreover, the challenge of accessing external financial resources constrains their capacity for investment and growth (Caralt et al., 2017; M4social, 2022; Sanchis Palacio & Campos Climent, 2007), heightening reliance on public funding (Fuster Morell & Espelt, 2019).

Exploring the impact of digital business (Consejo Económico y Social de España, 2021; Harris & Rea, 2009; Kane, 2017; Nisar et al., 2019; Parveen et al., 2016) and the influence of factors such as managerial knowledge, training, and skills on ICT adoption is crucial. These elements are recognized

as significant barriers to implementing ICT and e-business solutions in small organizations (Arendt, 2008).

2 Research Objectives

The objective of this research is to examine whether social organizations are genuinely promoting gender-equalitarian practices in the digitalization process and adopting of Open Knowledge and Free and Open Source Software (FLOSS) to establish a democratic infrastructure that fosters accountability, transparency, and knowledge accessibility.

3 Methodology

This study examines twenty-seven social economy organizations in Barcelona, selected from participants in the 2021 MatchImpulsa feminist digital acceleration program under the Barcelona UOC Chair in Digital Economy, supported by the Barcelona City Council, Barcelona Activa, and the Open University of Catalonia. The selection ensured diverse representation of organizations aligned with social and solidarity economy values, including non-profit status, varied governance models, and different levels of feminist practices and digitalization (Bases de la llei d'economia social i solidària de Catalunya, 2020). The analysis of nine gender-equalitarian practices is based on Equitest, an equality self-assessment tool used by the Barcelona City Council.

Data collection methods included an online form (from May to December 2021), which gathered general information on the organizations. Semi-structured interviews conducted with project leaders in November and December 2021 covered governance, business models, gender equality, inter-cooperation, digital strategy, knowledge policies, and impacts of COVID-19. Website and social media analyses were conducted throughout 2021, and participant observation (from June to December 2021) provided insights into the practices and challenges faced during their platformization efforts.

4 Results

The analysis of twenty-seven social economy initiatives in Barcelona reveals a diverse and representative sample. Notably, twenty-two initiatives are led by organizations with less than ten years of experience, encompassing nine of the ten sectors outlined in the Barcelona 2030 Social and Solidarity Economy Strategy. In terms of business models, twelve organizations operate hybrid Business-to-Business (B2B) and Business-to-Consumer (B2C) models, while six focus exclusively on B2C and three on B2B. Public administration serves as the primary source of funding, with twenty-one projects relying heavily on subsidies or public assistance. Budgets for digitalization vary significantly; only one project allocates €50,000 to €70,000, while most do not exceed €15,000.

Regarding financial performance metrics, only ten of the twenty-one organizations analyzed are tracking them, with four focusing solely on cash flow. This limited use of financial metrics contrasts with the overarching goal of increasing sales and revenue, posing a key challenge for medium-term platformization efforts. The level of professionalization among social economy entities is limited, as only eight out of seventeen organizations have dedicated digital strategy professionals. Consequently, eight organizations prioritize 'strengthening the workforce' as the second most critical need for advancing platformization in the medium term.

4.1 Gender-Egalitarian Practices

Of the twenty-seven organizations transitioning to digital platform models, twenty-two (81.48%) focus on vulnerable groups and/or feminism, and fifteen (55.56%) incorporate gender equality into their strategic plans. Eleven projects are led by women or emphasize feminist practices. Continuing with the analysis of financial metrics implementation, only one-fourth of the organizations align with those led by women or oriented towards feminist practices.

The analysis of nine gender-egalitarian practices reveals: (1) Sixteen out of twenty-seven projects collect Workforce Data Segregated by Gender; (2) Seventeen out of twenty-seven projects adopt gender-neutral and non-sexist communication; (3) Seventeen out of twenty-seven projects ensure equal access to all workplaces regardless of gender; (4) Eleven out of twenty-seven projects have protocols to prevent discrimination during hiring; (5) Eleven out of twenty-seven projects have measures to combat sexual harassment; (6) Seven out of twenty-seven projects focus on equitable distribution of permanent contracts; (7) Twelve out of twenty-seven projects provide equal access to training programs for internal promotion; (8) Eighteen out of twenty-seven projects implement additional flexible work time arrangements beyond legal requirements; (9) Fifteen out of twenty-seven projects integrate gender equality into their strategic planning. This analysis underscores the varying levels of implementation of standard gender-equality measures across different projects.

4.2 Open Knowledge and adopting FLOSS Tools

Regarding Open Knowledge and the adoption of FLOSS tools, sixteen projects are actively implementing open-source software tools, and nine are developing technology using open-source code. In terms of licensing, half of the projects indicate the use of public domain licenses, while two projects express a need for guidance in this area.

The adoption of common-use resources, open-source code, and/or content aligns with the commons approach that social economy organizations are integrating into their digital strategies. Seven out of twenty-one organizations prioritize implementing open technology, preferably FLOSS or decentralized open technology, while another seven emphasize their commitment to open knowledge, including open licenses, free content, and open data. Additionally, twenty out of the twenty-seven analyzed projects (74.02%) are generating common-use resources such as reports, articles, infographics, maps, video conferences, and graphic materials.

5 Conclusions

This study addresses the primary challenges of digitalization in social economy organizations and proposes future research directions, including the integration of a gender perspective (EIGE, 2021; EIGE, 2023). Social economy organizations transitioning to digital platforms predominantly adopt hybrid B2B and B2C models, relying heavily on public funds (Fuster Morell & Espelt, 2019). The implementation of gender-egalitarian measures underscores challenges in achieving gender equality (EIGE, 2021; UN Women, 2020; UNFPA, 2020), emphasizing the need to integrate a gender perspective more effectively into digitalization efforts.

While many organizations are implementing gender-egalitarian practices aligned with feminist values, limitations persist, such as the non-implementation of indefinite contracts. Future research should explore strategies for mainstreaming feminist digitalization, including promoting intensive feminist projects within new platform business models (EIGE: What Is Gender Mainstreaming, 2023). Additionally, examining how public policies can foster digitalization with a feminist perspective will be crucial (Codagnone, 2022).

Regarding open software and knowledge, this study confirms previous findings on the limited adoption of FLOSS tools in social organizations (XES, 2021; M4social, 2022). However, half of the organizations in the sample use public domain licenses and are open to sharing resources openly. Future research should investigate how social economy organizations can advocate more actively for widespread FLOSS adoption, particularly considering tools reintroduced during the COVID-19 pandemic.

The persistent lack of dedicated digital professionals remains a significant weakness in digitalization efforts within social economy projects (M4social, 2022), impacting digital impact evaluation and strategy implementation (Caralt et al., 2017). This deficiency also affects strategic management (Sanchis Palacio & Campos Climent, 2007; M4social, 2022), hindering comprehensive analysis of digital business strategies (Consejo Económico y Social de España, 2021; Harris & Rea, 2009; Kane, 2017; Nisar et al., 2019). Future research should explore whether there is a relationship between the workforce in social

organizations, public investment, and the implementation of impact indicators that aid strategic management during the transition to a digital business model.

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Examining the Sensemaking Process of Economically Vulnerable Groups in the Sharing Economy Context

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Abstract. *This study aims to integrate the sensemaking literature with the transformative service research to understand the decision-making processes of economically disadvantaged stakeholders in their interactions with ride-sharing companies. Through an exploratory qualitative investigation, based on the analysis of 53 in-depth interviews and a thematic analysis of the content of the two main social networking groups for vulnerable groups, the study found that the selection of vulnerable actors is influenced by a complex interplay of five elements, leading to three distinct sub-groups: non-switchers, switchers, and double agents. This research presents an empirical model that examines how the sensemaking and decision-making processes of marginalized and vulnerable stakeholders might impact the long-term viability of the business model of ride-sharing companies.*

Keywords. *sensemaking, vulnerable groups, wellbeing priorities, TSR, sharing economy*



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