Sustainability as a Motive for Choosing Shared-Mobility Services

Subjects: Business
Contributor: Andrzej Bąk, Elżbieta Nawrocka, Daria E. Jaremen

Shared-mobility services (SMS) is about the shared use of a vehicle, motorcycle, scooter, bicycle, or other travel modes that provide users with short-term access to a transportation mode on an as-needed basis. Shared mobility offers great opportunities for supporting sustainable development.

Keywords: shared-mobility services ; sharing economy platforms ; uber ; transport ; sustainability ; motives

1. Introduction

Shared-mobility services (SMS) remain a part of a wider sharing economy (SE) phenomenon developing in various spheres of the economy, i.e., finance, accommodation or transport. Today transport systems have become multimodal and the evolution of shared mobility has resulted in its many forms. It is about the shared use of a vehicle, motorcycle, scooter, bicycle, or other travel mode that provides users with short-term access to a transportation mode on an as-needed basis [1][2]. Accessing them is provided by the digital platforms related to Mobility-as-a-Service (MaaS) [3]. The presented SMS is defined as a type of the real-time car sharing based on location. The provision of these services is based on using geographic information systems (GIS) and technologies of global positioning systems (GPS) [4], combined with mobile technologies to organize shared rides arranged between drivers and passengers. Digital SMS platforms allow individuals using their car to transport others in return for a fee. In order to book a ride, customers use a smartphone application where they can additionally track the location of the required vehicle. Payment is usually made via the app at the end of the trip. According to Transit Cooperative Research Program (TCRP) Report [5], the shared-mobility service has become one of the most ubiquitous forms of car sharing. The term “shared mobility” was introduced to describe a car-sharing service (i.e., a ride-sharing service which combines more than one trip) [6]. The Shared-use Mobility Center [7] states that Uber, established in 2009 by G. Camp and T. Kalanicka, has been the largest company providing such services to date.

The technological factor [8] and the issues of positive influence on sustainable development were initially recognized as the primary driver of SE growth, whereas a car as a resource not used by its owner became, in 95% cases, next to a power drill, a flagship example confirming the contribution of the sharing economy to sustainable development [9]. However, Gerwe and Silva [9] suggest taking into account the individual preferences and characteristics of those using the discussed services when estimating the total net impact of the car sharing services on sustainable development. It is only when the individuals decide to act as responsible consumers and take sustainability seriously that they become engaged in appropriate actions [10]. Responsible consumers take into account the social, environmental and economic impacts of their consumption [11]. Responsibility is becoming an important dimension of attitudes and behaviors as well as the determinant of their market choices [12]. It has been highlighted that only the right choices of all SE participants (service providers, platforms, consumers, policy makers) result in the achievement of sustainable development goals. The awareness of both positive and negative consequences of using transport within the sharing formula service provides the basis for making good decisions. It influences the motives and, in the science of choice, the motives behind actions remain the most important research problems.

2. Shared-Mobility Motives

Shared-mobility service companies, including Uber, offer innovative and cheaper transport alternatives by reducing the marginal cost of service provision. These platforms are developing dynamically, offering a variety of services to meet diverse needs. Uber offers prearranged and on-demand transportation services in which drivers and passengers connect via digital applications, which are typically used for booking, electronic payment and ratings. Uber is included among the digital platforms related to MaaS. They enhance changes in social behavior in the market, which can be defined as transformations in the consumption model, i.e., moving from owning towards sharing [13][14], although as emphasized by

Barbu et al. [15], neither of these consumption patterns are going to fade away. In their opinion, they will continue to coexist, expanding the range of the available consumer options. From the perspective of a user, SMS are developing very dynamically primarily due to: the application availability and its many functions (e.g., new user data verification process through the application), user safety (monitoring drivers' driving and the control of trips made), user data security, payment data security and mobile application use security [16]. The research addressing SE is dominated by the studies covering accommodation and transportation services, where the authors' attention is mainly focused on Airbnb and Uber platforms.

The source literature on Uber provides analyses of the business model and factors behind its market success [17]. A frequently addressed research problem is the effect of introducing Uber to urban transport systems in different cities [18][19][20][21][22], taking into account the environmental impacts [23][24][25][26] and also the employment factor [27]. Much attention is paid to the issues of policy towards Uber and the regulations underlying its activities [28][29][30].

The motives are described in literature through the prism of many theories, the earlier ones such as, e.g., Maslow's Hierarchy of Needs or Herzberg's Motivation theory as well as the contemporary theories of motivation (e.g., Expectancy theory) [31], Acquier et al. [32] and Möhlmann [33], who proposed a division into external and internal motives, and Dann [34], who conducted a decomposition of push and pull motives. The theory of push and pull motivations is often used in the studies on motivation in tourism. People travel because they are propelled by the psyche (push) and drawn by external forces (pull) [35][36]. As Hossain [37] states, motivation stands for an essential issue when it comes to the success of SE initiatives, hence the motives represent an important problem in research where the authors' attention is focused both on the service providers and customers. Additionally, consumers' motives are identified in terms of users—non-users and, as shown by Hawlitschek et al. [38], non-users' motives are analyzed much less frequently. Most of the studies cover the accommodation sector. According to the analyses by Böcker and Meelen [39] and Hossain [37], there are gaps in the research on the motives followed by those using car sharing services and, as emphasized by Sung et al. [40], few of them discuss the motivations related to using platforms from the consumer's perspective. At this point, it is important to highlight the significance of focusing on the motives in various SE sectors, because as the research findings by Böcker and Meelen [39] show, they remain diversified depending on the analyzed field. According to these authors, SE should not be approached as one coherent phenomenon.

3. Sustainability

Sustainable development has been identified as one of the greatest contemporary challenges. Based on the review of the previously published papers on sharing economy, Ranjbari et al. [41] stated that sustainability is an important concept applied in research. According to the authors, shared mobility offers great opportunities for supporting sustainable development [22]. In the opinion of many researchers, sharing the unused resources contributes to the efficiency improvement of their use. In other words, SMS should result in both economic (additional revenues and savings), social (access to services, convenience, additional functionalities) and environmental benefits (reduction in energy consumption, greenhouse gas emissions, PM2.5 pollution and traffic congestion and noise) [1][3][42][43][44][45][46]. However, there is evidence that this positive impact of sharing on sustainability is not an unequivocal one [46]. Barnes et al. [44] indicate that the effect of reducing PM2.5 emissions may be temporary. The researchers analyzing one selected first-order effect usually resulting in findings confirming the positive impact of car sharing on the environment, society or economy [42][47][48][49]. In turn, those who perceive the problem in a broader perspective (second-order effects) are highly skeptical about this positive influence, e.g., Jung and Koo [46]. According to Codagnone et al. [50], in practice it has neither been sufficiently transparent nor reliably documented. Demonstrating the net impact in terms of environmental sustainability at an aggregated level is extremely difficult and complex [51]. As some researchers claim, the problem of economic effects of SE development as well as social and environmental issues should still remain the subject of scientific studies [52][53].

References

1. Tesoriere, G.; Campisi, T. The benefit of engage the "crowd" encouraging a bottom-up approach for shared mobility rati ng. In Proceedings of the International Conference on Computational Science and Its Applications—ICCSA 2020, 20th International Conference, Cagliari, Italy, 1–4 July 2020; Springer: Cham, Switzerland, 2020; pp. 836–850.
2. Shaheen, S.; Wong, S. Future of Public Transit and Shared Mobility: Scenario Planning for COVID-19 Recovery. UC Of fice of the President: University of California Institute of Transportation Studies. 2021. Available online: https://escholars hip.org/uc/item/15t657r2 (accessed on 16 May 2022).
3. Campisi, T.; Garau, C.; Acampa, G.; Maltinti, F.; Canale, A.; Coni, M. Developing Flexible Mobility On-Demand in the Er a of Mobility as a Service: An Overview of the Italian Context Before and After Pandemic. In Proceedings of the Internat

ional Conference on Computational Science and Its Applications—ICCSA 2021, 21st International Conference, Cagliari, Italy, 13–16 September 2021; Springer: Cham, Switzerland, 2021; pp. 323–338.

4. Chan, N.D.; Shaheen, S.A. Ridesharing in North America: Past, Present, and Future. Transp. Rev. 2012, 32, 93–112.
5. Shared-Use Mobility Center. TCRP Report 188: Shared Mobility and the Transformation of Public Transit. Research Analysis; Shared-Use Mobility Center (SUMC): Chicago, IL, USA, 2016.
6. Mohamed, M.J.; Rye, T.; Fonzone, A. UberPOOL Services—Approaches from Transport Operators and Policymakers in London. Transp. Res. Proced. 2020, 48, 2597–2607.
7. Shared-Use Mobility Centre. Shared-Use Mobility Reference Guide; Shared-Use Mobility Centre: Los Angeles, CA, USA, 2015.
8. Fu, X. Does heavy ICT usage contribute to the adoption of ride-hailing app? Travel Behav. Soc. 2020, 21, 101–108.
9. Gerwe, O.; Silva, R. Clarifying the Sharing Economy: Conceptualization, Typology, Antecedents, and Effects. Acad. Manag. Perspect. 2020, 34, 65–96.
10. Genç, R. Ekonomia współdzielenia i zarządzanie zrównoważonym rozwojem środowiska w sektorze turystycznym w skali globalnej . Turyzm Tourism 2019, 29, 21–24.
11. Phipps, M.; Ozanne, L.K.; Luchs, M.G.; Subrahmanyan, S.; Kapitan, S.; Catlin, J.R.; Gau, R.; Walker Naylor, R.; Rose, R.L.; Simpson, B.; et al. Understanding the inherent complexity of sustainable consumption: A social cognitive framework. J. Bus. Res. 2013, 66, 1–8.
12. Reed, A. Social identity as a useful perspective for self-concept-based consumer research. Psychol. Mark. 2002, 19, 235–266.
13. Martin, C.J.; Upham, P.; Budd, L. Commercial orientation in grassroots social innovation: Insights from the sharing economy. Ecol. Econ. 2015, 118, 240–251.
14. Martin, C.J. The sharing economy: A pathway to sustainability or a nightmarish form of neoliberal capitalism? Ecol. Econ. 2016, 121, 149–159.
15. Barbu, C.M.; Florea, D.L.; Ogarcă, R.F.; Barbu, M.C.R. From Ownership to Access: How the Sharing Economy is Changing the Consumer Behavior. Amfiteatru Econ. 2018, 20, 373–387.
16. Turoń, K.; Kubik, A.; Chen, F. Electric Shared Mobility Services during the Pandemic: Modeling Aspects of Transportation. Energies 2021, 14, 2622.
17. Watanabe, C.; Naveeda, K.; Neittaanmäki, P. Co-evolution of three mega-trends nurtures un-captured GDP—Uber's ride-sharing revolution. Technol. Soc. 2016, 46, 164–185.
18. Mounce, R.; Nelson, J.D. On the potential for one-way electric vehicle car-sharing in future mobility systems. Transp. Res. Part A Policy Pract. 2019, 120, 17–30.
19. Gonzalez-Padron, T.L. Ethics in the sharing economy: Creating a legitimate marketing channel. J. Market. Channels 2017, 24, 84–96.
20. Leighton, P. Professional self-employment, new power and the sharing economy: Some cautionary tales from Uber. J. Manag. Organ. 2016, 22, 859–874.
21. Glotz-Richter, M. Reclaim Street Space!—Exploit the European potential of car sharing. Transportation Res. Procedia 2016, 14, 1296–1304.
22. Cohen, B.; Kietzmann, J. Ride On! Mobility Business Models for the Sharing Economy. Organ. Environ. 2014, 27, 279–296.
23. Sabouria, S.; Park, K.; Smith, A.; Tian, G.; Ewing, R. Exploring the influence of built environment on Uber demand. Transp. Res. Part D Trans. Environ. 2020, 81, 102296.
24. Kim, K.; Baek, C.; Lee, J.D. Creative destruction of the sharing economy in action: The case of Uber. Transp. Res. Part A Policy Pract. 2018, 110, 118–127.
25. Young, M.; Allena, J.; Farbera, S. Measuring when Uber behaves as a substitute or supplement to transit: An examination of travel-time differences in Toronto. J. Transp. Geogr. 2020, 82, 102629.
26. Willis, G.; Tranos, E. Using 'Big Data' to understand the impacts of Uber on taxis in New York City. Travel Behav. Soc. 2021, 22, 94–107.
27. Murillo, D.; Buckland, H.; Val, E. When the sharing economy becomes neoliberalism on steroids: Unravelling the controversies. Technol. Forecast. Soc. 2017, 125, 66–76.

28. Zhang, C. China's new regulatory regime tailored for the sharing economy: The case of Uber under Chinese local gove rnment regulation in comparison to the EU, US, and the UK. Comput. Law Secur. Rev. 2019, 35, 462–475.

29. Pelzer, P.; Frenken, K.; Boon, W. Institutional entrepreneurship in the platform economy: How Uber tried (and failed) to change the Dutch taxi law. Environ. Innov. Soc. Transit. 2019, 33, 1–12.

30. Flores, O.; Rayle, L. How cities use regulation for innovation: The case of Uber, Lyft and Sidecar in San Francisco. Tran sp. Res. Proced. 2017, 25, 3756–3768.

31. Haque, M.F.; Haque, M.A.; Islam, S. Motivational Theories—A Critical Analysis; ASA University Review; ASA University: Dhaka, Bangladesh, 2014; Volume 8.

32. Acquier, A.; Daudigeos, T.; Pinkse, J. Promises and paradoxes of the sharing economy: An organizing framework. Tech nol. Forecast. Soc. 2017, 125, 1–10.

33. Möhlmann, M. Collaborative consumption: Determinants of satisfaction and the likelihood of using a sharing economy o ption again. J. Consum. Behav. 2015, 14, 193–207.

34. Dann, G.M.S. Anomie, Ego-enhancement and Tourism. Ann. Tourism Res. 1977, 4, 184–194.

35. Crompton, J.L. Motivations for Pleasure Vacations. Ann. Tourism Res. 1979, 6, 408–424.

36. March, R.G.; Woodside, A.G. Tourism Behavior: Travelers' Decisions and Actions; CABI Publishing: Cambridge, UK, 20 05.

37. Hossain, M. Sharing economy: A comprehensive literature review. Int. J. Hosp. Manage. 2020, 87, 102470.

38. Hawlitschek, F.; Teubner, T.; Gimpel, H. Understanding the Sharing Economy—Drivers and Impediments for Participati on in Peer-to-Peer Rental. In Proceedings of the 49th Hawaii International Conference on System Sciences (HICSS), K auai, HI, USA, 5–8 January 2016; pp. 4782–4791. Available online: https://www.fim-rc.de/Paperbibliothek/Veroeffentlich t/524/wi-524.pdf (accessed on 15 July 2021).

39. Böcker, L.; Meelen, T. Sharing for people, planet or profit? Analyzing motivations for intended sharing economy particip ation. Environ. Innovat. Soc. Transit. 2016, 23, 28–39.

40. Sung, E.; Kim, H.; Lee, D. Why Do People Consume and Provide Sharing Economy Accommodation?—A Sustainability Perspective. Sustainability 2018, 10, 2072.

41. Ranjbari, M.; Morales-Alonso, G.; Carrasco-Gallego, R. Conceptualizing the Sharing Economy through Presenting a C omprehensive Framework. Sustainability 2018, 10, 2336.

42. Chen, T.D.; Kockelman, K.M. Carsharing's life-cycle impacts on energy use and greenhouse gas emissions. Transp. R es. Part D Trans. Environ. 2016, 47, 276–284.

43. Toni, M.; Mattia, G.; Renzi, M.F. Understanding the link between collaborative economy and sustainable behavior: An e mpirical investigation. J. Clean Prod. 2018, 172, 4467–4477.

44. Martin, E.; Shaheen, S. Greenhouse gas impacts of car sharing in North America; Report 09-11. In IEEE Transactions on Intelligent Transportation Systems; Mineta Transportation Institute: San Jose, CA, USA, 2010.

45. Barnes, S.J.; Guo, Y.; Borgo, R. Sharing the air: Transient impacts of ride-hailing introduction on pollution in China. Tra nsp. Res. Part D. Trans. Environ. 2020, 86, 102434.

46. Jung, J.; Koo, Y. Analyzing the Effects of Car Sharing Services on the Reduction of Greenhouse Gas (GHG) Emissions. Sustainability 2018, 10, 539.

47. Nijland, H.; van Meerkerk, J.; Hoen, A. Impact of Car sharing on Mobility and CO2 Emissions. PBL Netherlands Environ mental Assessment Agency. PBL Publication Number 1842. 2015. Available online: http://www.pbl.nl/sites/default/files/c ms/publicaties/PBL_2015_Note%20Impact%20of%20car%20sharing_1842.pdf (accessed on 28 July 2021).

48. Firnkorn, J.; Müller, M. What will be the environmental effects of new free-floating car-sharing systems? The case of car 2go in Ulm. Ecol. Econ. 2011, 70, 1519–1528.

49. Baptista, P.; Melo, S.; Rolim, C. Energy, environmental and mobility impacts of car-sharing systems. Empirical results fr om Lisbon, Portugal. Procedia Soc. Behav. Sci. 2014, 111, 28–37.

50. Codagnone, C. Lobbying as rhetorical framing in the 'sharing economy': A case study on the limits and crisis of the evid ence based policy paradigm. DigiWorld Econ. J. 2017, 108, 15–44.

51. Schor, J. Debating the Sharing Economy. The Great Transition Initiative (October 2014). Available online: http://www.gr eattransition.org/publication/debat-ing-the-sharing-economy (accessed on 14 May 2021).

52. Gordo-López, Á.; de Rivera, J.; Cassidy, P.R. The measurement of the economic, social and environmental impact of P eer to Peer online platforms: The case of collaborative consumption. EMPIRIA Rev. Metodol. Cienc. Soc. 2021, 49, 87–119.

53. Parguel, B.; Lunardo, R.; Benoit-Moreau, F. Sustainability of the sharing economy in question: When second-hand peer-to-peer platforms stimulate indulgent consumption. Technol. Forecast. Soc. 2017, 125, 48–57.