A 2020 perspective on “Service quality management of online car-hailing based on PCN in the sharing economy”

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Note: This article has been accepted for publication by *Electronic Commerce Research and Applications*.

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Abstract: Current studies revealed that the sharing economy faced new barriers and issues in new development context, such as trust and privacy issues. By integrating the theories of sharing economy and service science, we explored how to solve the service issues of online car-hailing based on PCN. We also explored services in the sharing economy from three levels: personal behavior, platform service and government regulation. With the service-dominant logic replacing the product-dominant logic, we suggest that research in the sharing economy and e-commerce should further systematically apply the important theories of service science, and make use of emerging technologies to develop new research methods.

Key words: sharing economy; service quality; online car-hailing; PCN; eWOM

Latest literature on the sharing economy still focus on its nature, business model and sustainable development. (1) The nature of the sharing economy. The nature of the sharing economy has changed in the digital economy. Chen and Wang (2019) defined the sharing economy as a type of digital economy and emphasized the importance of its digital-economy nature, in which data were considered as key production factor to create value for different stakeholders in the whole value chain. The changing nature has also changed the challenges in the sharing economy. The sharing economy ecosystem is not yet in healthy shape, as there are a variety of development issues related to business model, governance, employment concerns, externality, triadic relationship and consumption practices (Leung et al., 2019). Especially in the field of transportation, over-regulation, inconsistent quality of service and the need for recommendation are the three potential barriers in the growth process (Standing et al., 2019).

(2) The business model of the sharing economy. Firms need to incorporate consumers as active co-producers in the value creation process and define new marketing actions, as consumers are also co-producers in the sharing economy business models (Dellaert, 2019). It was found that the customer value proposition (CVP) in the sharing economy business model includes economic, social, emotional and technical, among which social and emotional values

were more significant in making the sharing economy successful (Zhang, 2019).

(3) The sustainable development of the sharing economy. Geissinger et al. (2019) found that the sustainability orientations were different among the platforms, while the sustainability connotations were diverse among various sectors of the sharing economy. Dominating role platforms put less emphasis on sustainability orientations. In response to the sustainability issues of the sharing economy, Leung et al. (2019) put forward three strategies toward an ecosystem: alignment to mutual interests, collaboration for shared success, and commitment to social responsibility.

In addition, current studies also focus on the trust and privacy issues in the sharing economy. Online reviews or reputations were empirically proved to influence consumers' trust in platforms. Online reviews in the sharing economy could influence consumers' trust perceptions (Cheng et al., 2019). The personal reputation and product reputation are crucial in optimizing revenues of the sharing economy platforms (Abrate and Viglia, 2019). The reputation of service provider in the sharing economy could positively moderate the effect of social influence on customer sustainable consumption behaviors and thereby improve the sales performance of platforms (Wang et al., 2019). It was also found that reputation indicators had a positive impact on trust of the platforms, and reputation systems would incent platforms to ensure a high level of service quality (Basili and Rossi, 2020). Privacy issues are another important research topic in the sharing economy, prior studies empirically investigated the role of privacy concerns in sharing platforms. Contemporary C2C platforms, such as Airbnb, are facing unprecedented problems of privacy, provider's privacy concerns will negatively affect their intention to share information concerning personal resources (Teubner and Flath, 2019). As for consumers, perceived privacy risk has a negative impact on their booking intention in shared accommodation (Xu and Schrier, 2019).

Service-dominant logic suggests that service provision is fundamental to economic exchange and all economies are services economies. As a new economic mode, sharing economy is essentially services economy. Therefore, integrating service science to study sharing economy is not only an innovative perspective, but also an important research topic of platform service. With the emergence of the sharing economy, many service issues remain to be resolved. The service quality management, service design and optimization, and service

innovation of the platforms become important research topics.

From a 2020 perspective, what is most significant in our article is the theoretical integration of sharing economy and service science. From the perspective of service quality management, we explored how to solve the service issues of online car-hailing in the sharing economy. Prior studies on the sharing economy mainly focuses on its concept and business model, and there exists a research gap in the service quality management of the sharing economy. This article found an innovative perspective. The research framework we proposed in the study makes theoretical contributions to the sharing economy, and provides implications for the sharing economy platforms to develop data-driven operation management strategies.

In addition, it is novel that we used PCN to depict the service process of online car-hailing. In the sharing economy, the three entities, sharing platform, service provider and service receiver form a service network. PCN can effectively depict the complex interactions among the three entities of online car-hailing: platform, driver and passenger, overcoming the limitations of blueprinting in depicting the service network. And PCN's optimization principles, including process inefficiency, economies of scale, customization and surrogate positioning, can help to optimize the service process. We used PCN to depict in detail how to solve the service issues of online car-hailing, and realize service optimization and innovation.

Online car-hailing is an emerging e-commerce mode in the context of sharing economy. From the perspective of online car-hailing platform service, it is a B2C mode, while from the perspective of driver service, it is a C2C mode. Different from the traditional e-commerce mode, the transaction object of online car-hailing is intangible services rather than tangible goods. In this article we studied this emerging e-commerce mode from a service perspective, and applied data mining methods to analyzed the eWOM data, making it an appropriate example of ECRA publishes. In this article, we comprehensively applied methods such as deep learning (LSTM text classification model), sentiment analysis, and frequent itemset mining (FP-Growth algorithm) to mine service issues from the eWOM data of online car-hailing service. In the era of big data and artificial intelligence, massive data become important information resources of e-commerce enterprises, with great potential research value and commercial value, and artificial intelligence technologies, such as data mining, machine learning, deep learning, become efficient tools for Academia and business. Therefore, how to

apply big data and artificial intelligence to the study of e-commerce in the sharing economy and how to use these technologies and methods to mine valuable knowledge from the massive data is an important research direction in the future.

For services in the sharing economy, we explored related issues from three levels: personal behavior, platform service and government regulation. We studied the topics including user value co-creation behavior, platform service quality management, platform service innovation and government supervision, and we got a series of research findings.

On the personal behavior level, we integrated the theories of sharing economy, value co-creation and social interaction, took online car-hailing as an example to study the factors influencing user value co-creation behavior, and revealed the influencing mechanism of value co-creation process in the sharing economy.

On the platform service level, we mainly studied the service quality management and service innovation of the sharing economy platforms. In the aspect of service quality management, we used the coding method in qualitative research to analyze the news data of online car-hailing platform (Didi Chuxing), and used text mining method to analyze the review data of online accommodation platform (Airbnb). Then we combined SERVQUAL to evaluate the service quality of the platforms from five dimensions: tangibility, reliability, responsiveness, assurance and empathy, putting forward propositions and implications for platforms' service quality management. In the aspect of service innovation, we introduced the theory of invention problem solving TRIZ to solve the service issues of online car-hailing. We adapted the technical parameters and innovation principles of TRIZ to the service attributes and solved the service issues with contradiction matrix. We constructed a theoretical framework of service innovation in the sharing economy and demonstrated its feasibility with the case study of Uber. We also applied blueprinting to depict the service process of online car-hailing, and then used contradiction matrix, innovation principles, substance-field model and other tools in TRIZ to solve the service issues, optimize the service process and propose the service innovation schemes. Our study showed that the service innovation framework that combined the blueprinting and TRIZ can effectively deal with the service issues of online car-hailing and thereby realize service process optimization and service innovation.

On the government regulation level, from the perspective of stakeholders, we built an

evolutionary game model among online-hailing platform, driver and passenger, considering whether there is government regulation. And we built a system dynamics model to simulate and analyze the online car-hailing regulation system, to study how the government can effectively regulate the market from five aspects: punishment mechanism, incentive mechanism, policy adaptability, public participation and principal-agent.

In the future, it is still necessary to further explore how to solve the barriers and issues of the sharing economy to promote its sustainable development, such as the trust and privacy issues of platforms. With the service-dominant logic replacing the product-dominant logic, we suggest that research in the sharing economy and e-commerce should further systematically apply the important theories of service science, such as service delivery, service design, service innovation, service evidence, service quality management and so on. It is important to realize the theoretical integration and theoretical innovation of sharing economy and service science, and provide valuable insights for the service operation of sharing economy platforms. In the era of big data and artificial intelligence, research on the sharing economy also needs to find more data sources, fully explore the value of data, and make use of emerging technologies to develop new research methods.

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