

An Exploratory Factor and Cluster Analysis of the Willingness to Pay for Last Mile Delivery

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Abstract : The COVID-19 pandemic is accelerating the already growing field of e-commerce. The resulting urban freight transport volume leads to traffic and negative environmental impact. Furthermore, the service level of parcel logistics service provider is lacking far behind the expectations of consumer. These challenges can be solved by radically reorganize the urban last mile distribution structure: parcels could be consolidated in a micro hub within the inner city and delivered within time windows by cargo bike. This approach leads to a significant improvement of consumer satisfaction with their overall delivery experience. However, this approach also leads to significantly increased costs per parcel. While there is a relevant share of online shoppers that are willing to pay for such a delivery service there are no deeper insights about this target group available in the literature. Being aware of the importance of knowing target groups for businesses, the aim of this paper is to elaborate the most important factors that determine the willingness to pay for sustainable and service-oriented parcel delivery (factor analysis) and to derive customer segments (cluster analysis). In order to answer those questions, a data set is analyzed using quantitative methods of multivariate statistics. The data set was generated via an online survey in September and October 2020 within the five largest cities in Germany ($n = 1.071$). The data set contains socio-demographic, living-related and value-related variables, e.g. age, income, city, living situation and willingness to pay. In a prior work of the author, the data was analyzed applying descriptive and inference statistical methods that only provided limited insights regarding the above-mentioned research questions. The analysis in an exploratory way using factor and cluster analysis promise deeper insights of relevant influencing factors and segments for user behavior of the mentioned parcel delivery concept. The analysis model is built and implemented with help of the statistical software language R. The data analysis is currently performed and will be completed in December 2021. It is expected that the results will show the most relevant factors that are determining user behavior of sustainable and service-oriented parcel deliveries (e.g. age, current service experience, willingness to pay) and give deeper insights in characteristics that describe the segments that are more or less willing to pay for a better parcel delivery service. Based on the expected results, relevant implications and conclusions can be derived for startups that are about to change the way parcels are delivered: more customer-orientated by time window-delivery and parcel consolidation, more environmental-friendly by cargo bike. The results will give detailed insights regarding their target groups of parcel recipients. Further research can be conducted by exploring alternative revenue models (beyond the parcel recipient) that could compensate the additional costs, e.g. online-shops that increase their service-level or municipalities that reduce traffic on their streets.

Keywords : customer segmentation, e-commerce, last mile delivery, parcel service, urban logistics, willingness-to-pay

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