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Customer Acceptance of Urban Logistics Delivery Concepts

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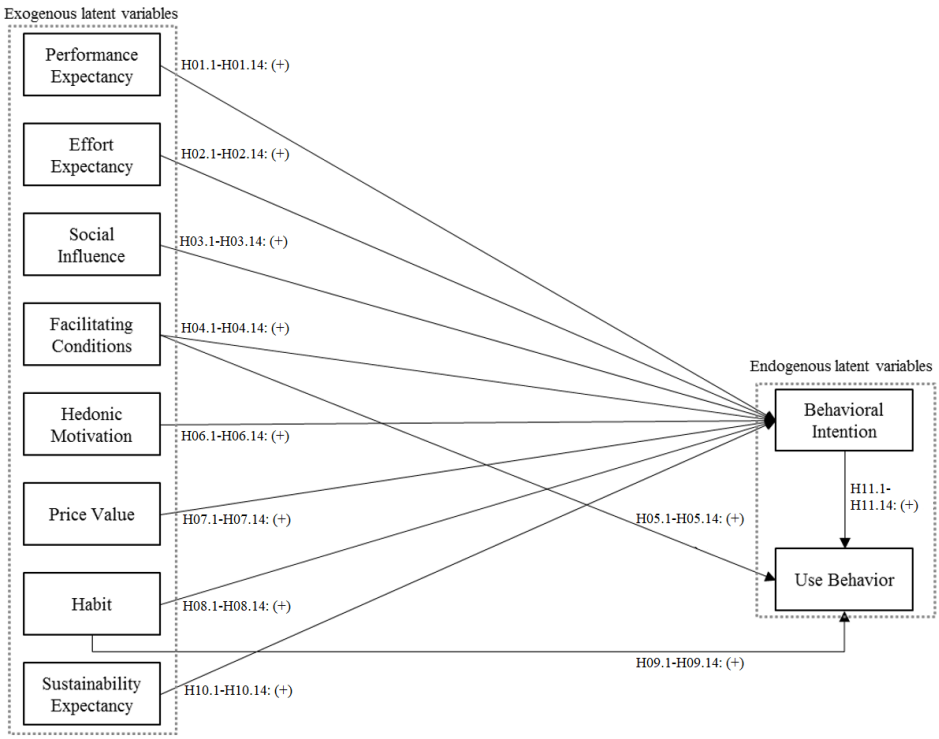

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1 Introduction and Motivation

The importance of urban logistics has continuously increased in recent years. Various global trends such as rising urbanization and the growing importance of the internet are the main reasons for this. As a result of online retailing, every private household in urban areas is now a potential recipient of products. This poses particular challenges for the logistics sector. Accordingly, transport management by logistics service providers in urban areas has been aggravated by the high number of orders from customers. This is also linked to an accumulation of urban freight traffic. The consequences of this development are related to increasing environmental pollution, noise nuisance and traffic congestion (Taniguchi et al., 2014). Integrated concepts that enable cities to cope with the traffic situation as a result of the numerous shipments are not sufficiently available yet. Hence, urban stakeholders from politics and industry are committed to finding a solution. A demand-oriented and modern offer of logistics services is also a significant location factor for the urban economy (Erd, 2015). Consequently, growing urban conurbations require an efficient and flexible supply of alternative shipment options that are also compatible with the needs of the inhabitants and the environment. With regard to alternative delivery methods, a successful implementation primarily depends on the acceptance and application of end customers (Wang et al., 2018).

Regarding scientific research, publications on end customer acceptance of urban logistics concepts is limited. To date, only four articles dealing with the end customer acceptance of urban logistic delivery concepts. Niehaus (2005) firstly analyses various delivery-services in the business-to-customer (B2C) fraction of e-commerce. A survey was used to investigate the acceptance of early box systems without the use of information and communications technology in contrast to customary home delivery. Another acceptance study is conducted by Ehrler and Hebes (2012) on the use of electro mobility in urban areas. In this article, extensive interviews enable an in-depth analysis of user needs, user expectations, and user acceptance by vehicle drivers, vehicle buyers and end customers (Ehrler and Hebes, 2012). In order to better understand online shoppers' attitudes towards new delivery services, de Oliveira et al. (2017) analyzed the potential demand of automatic delivery stations. For this purpose, a survey according to stated preference and revealed preference methods and assessed potential users considering two delivery services was developed: home delivery and automated delivery stations. This study offers an approach in interpreting the preferences of end users in terms of designing innovations on the last mile (de Oliveira et al., 2017). Wang et al. (2018) examines the acceptance of customers for the use of an automated parcel station. In this process, the acceptance behavior of customers is validated by means of a survey. To conclude, research on the acceptance of urban logistic delivery concepts is quite rare.

The overall objective of this discussion paper is to examine potential acceptance factors

for urban logistics concepts from an end customer perspective. Considering this, findings will be developed and formulated on the basis of an acceptance analysis. In order to present an adequate scientific approach, an appropriate research question (RQ) is necessary to accomplish the objective of this work.

Therefore, our RQ guiding the whole discussion paper is:

Which factors influence the acceptance of urban logistics concepts among end customers?

The remainder of this discussion paper is structured as follow: in the second section, the investigated delivery concepts are introduced. The methodology and the creation of the survey is part of section three. Subsequently, the results of the empirical investigation are presented. The fifth section discusses the conducted approach and offers recommendations. Limitations are part of section six, while conclusions and outlook closes the discussion paper.

2 Urban Logistic Delivery Concepts

Urban Logistic delivery concepts are in this discussion paper understood as alternative delivery method using new technological or infrastructural elements during the delivery process. The focus does not lie on intelligent transport systems using GPS for traffic management (Ranieri et al., 2018) neither on the replacement of traditional vehicles through electrified ones.

To improve the chances of successful deliveries, customers are already being provided with various delivery options in numerous locations (Moroz and Polkowski, 2016). At this point, the deployment of collection points is one of the most wide-spread solutions. The recipient receives the order at a certain location and is given the opportunity to collect it there (Schnedlitz et al., 2013). In order to offer the customer a certain degree of convenience here, preference is given to facilities that have long opening hours or are in locations with good transport connections. Typically, these places are shops, parcel machines, package boxes or post offices. Automated parcel machines and package boxes stations are also preferably installed at locations with high population density and good accessibility (Moroz and Polkowski, 2016). Such an approach to the delivery of parcels is useful in many respects. As the driver delivers his consignments to one destination, the number of kilometers is reduced (Erd, 2015). The tours will consequently become shorter, more coordinated and more cost-efficient. This is accompanied by a reduction in the volume of traffic and environmental and noise pollution (Taefi et al., 2016). Furthermore, the recipient is no longer restricted to the delivery times of the courier, express, and parcel (CEP) services. This provides greater flexibility with regard to when the parcel is collected. If ordered goods are shipped to a pick-up point or automated parcel machine, the customer will be informed about the delivery. This allows the customer to pick up the stored items, for example, on the way

Since the results deviated largely from the assumed effect relationships and only 40 out of 154 hypotheses could be supported, it can be assumed that other factors influence the behavioral intention of customers when buying goods and grocery online. In case of e-grocery, customers in Germany are still skeptical and risk-averse about buying online food, which especially hold for pure player food suppliers. In this context, future research could be conducted on pure players and integrate further factors such as trust or risk perceptions into the research, since these variables were already proven in affecting individuals' decision to purchase e-commerce products and services (Dinev and Hart, 2006; Gefen et al., 2003).

As the results revealed significant effects of, both, SE and PV on BI, but no information about customers specific price expectations, e-food retailers and logistics operators may be interested in discovering knowledge about which maximum price customers would be willing to pay for more sustainable delivery options. Therefore, future research on customers' willingness-to-pay for sustainable deliveries might be of great interest.

Regarding especially e-grocery supply, another limitation refers to country differences. The literature and market observations of the e-food market show that the German online food sector is not yet experiencing the popularity as in Great Britain or South Korea. Customers in these countries are likely to have much more general confidence and experience in online food shopping and delivery services. By cross-nationally comparing e-food customers in several countries, future research may therefore be able to gain insights for the German market, especially with regard to sustainable delivery methods, which could already be more advanced. While ecological sustainability expectations have an influence on integration to use in this study, this influence was not confirmed in a study on the acceptance of parcel machines in Poland.

Furthermore, participants in the survey may have concepts with a particular delivery of food retail companies that they are unwilling or extremely positive about anyway, which may distort the results, which is commonly known as the halo effect (Weiber and Mühlhaus, 2014). Customers may also have a negative attitude towards online shopping in general. Therefore, future research may integrate factors such as attitude towards e-food shopping in future research models.

7 Conclusion

The overall objective of this study was to identify relevant influencing factors with regard to customer acceptance of urban logistics concepts. Against this background, fundamental aspects of urban logistics were initially explained.

Concerning the empirical approach of this study, the research model of UTAUT2 was applied, which was subsequently extended by an additional construct. The model was tested on 14 urban logistics concepts and evaluated by means of an online survey. In the course of the subsequent data assessment, it was observed that only certain

constructs had a significant influence on customer acceptance of urban logistics concepts. In this respect, the factors HT and PE were frequently found to be relevant. The results indicated that PE is the most significant antecedent of end customers BI. Hence, PE was relevant for seven of the 14 concepts presented. Further, it was pointed out that the actual UB of customers to utilize urban logistics concepts was exclusively positively influenced by the HT factor. With respect to customers UB, HT revealed a strong significance for thirteen of the included concepts.

The results from the data analysis were discussed, reasons for significance and insignificance of the constructs of the treated research model were explained. Based on this, recommendations for practical actions were formulated. Consequently, CEP service providers and e-grocery suppliers should take into account that PE and HT are essential factors for the acceptance of urban logistics concepts among end customers. As a result, CEP companies need to generate customer confidence by actively communicating the benefits of their concepts and ensuring a consistent and good service. In terms of the limitations, it was pointed out that the research model designed for this work should be further modified. This could identify other essential factors for the acceptance of urban logistics concepts among end customers. Moreover, in the preparatory course of the survey, it was assumed that the SE factor could increase the customer's intention to use urban logistics concepts. However, this presumption was not confirmed as part of the data analysis. Further research should address this topic, as sustainability and environmental protection are central aspects in the implementation of urban logistics concepts.

After all, essential factors for influencing the acceptance of urban logistics concepts among end customers were accentuated in this study. In order to further expand the current state of research, numerous possibilities for future studies were additionally formulated. In principle, it is to state that all logistics concepts presented above can be suitable solutions to overcome the challenges on the last mile. However, these approaches must be considered in a more differentiated way. Depending on the local circumstances of each region and city, urban logistics concepts need to be adapted individually, in order to achieve the optimal impact, taking into account the requirements and objectives of end customers and other urban stakeholders.

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