

Urban Logistics: Smart Cities, Future Challenges and Chances for CEP Services

Masterarbeit

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1. Introduction

1.1 Relevance of the Topic

The majority of the world's population lives in the cities, which will grow, as a result. 52% of the world's population live in urban areas and this figure is expected to rise to 67% by 2050 (cf. Arthur D. Little, 2015, p.3). Logistics nowadays is a major part of the economy. Both nationally and internationally, the economic development of recent years has led to the formation of complex corporate networks. A control of the goods flows has both an operational as well as economic importance in logistics. The CEP (Currier, Express and Packages) service providers play an important role in this sector. Their task is to collect parcels from the consignor and deliver them to the recipient worldwide without any problems. Due to the ever-growing e-commerce, the urban goods distribution continues to grow. While 2.95 billion consignments were delivered in Germany in 2015, an increase to 3.78 billion packets is expected for 2020 (cf. Biek, 2017, p. 17). The e-commerce is the fastest growing driver of urban deliveries, which also impacts the urban logistics flows. As a result of increased demand for logistics, more and more CEP vehicles will be under way in the cities. This increase in urban traffic entails some negative aspects, including congestion, pollution, noise and quality of life issues. Today's logistics is responsible for around 10% of global CO₂ emissions (cf. Appendix II D, A1). Climate protection is thus becoming more and more important for the urban logistics. The last mile delivery is a difficult subject, as it involves several levels of complexity. This includes the various stakeholders who are involved in the process of urban logistics. The most important stakeholders are the authorities, freight transport operator, online trade & retail, manufacturers & suppliers and the customers (cf. Lindholm, 2012, p. 90). In doing so, stakeholders often pursue different interests and goals. Often these stakeholders lack the common understanding of the status quo. While the authorities are interested in ways to reduce congestion, pollution and noise, transport freight operators and retailers are mainly concerned with keeping costs under control while maintaining or increasing their service levels (cf. Arthur D. Little, 2015, p.3). This complexity and tension between stakeholders can often lead to sub-optimal decisions in urban logistics.

1.2 Objective and Structure of the Thesis

To solve the above mentioned problems, it is important to look at the stakeholders in urban logistics more closely and to analyze them. The empirical work consists of the following research question.

- Which conflict and synergy potentials exist between the individual stakeholders in urban logistics and which challenges and chances do they represent for CEP service providers?

The main focus of the empirical work is on the qualitative survey of experts from the various stakeholders of urban logistics.

In order to answer the research question, the following chapter will first explain the basic principles of the theory. The terms of the urban logistics, smart city, e-commerce, last mile and the CEP service providers are defined more precisely here. Chapter three provides an overview of already existing and new innovative logistics concepts and also covers the field of alternative drive technologies for the CEP service providers. In the fourth chapter, the framework on which the qualitative research is based is created and explained in more detail. In addition, possible aims and interests of the stakeholders from the literature research are compiled and the methodology of the data collection is discussed in more detail. In Chapter five, the results of the 10 expert interviews conducted are evaluated in order to discuss the results in more detail in chapter 6 and to present possible recommendations for action for the CEP service providers. In addition, some limitations of the empirical work will be presented. Finally, a summary of the highlights of the empirical work will be drawn and then a brief outlook on the future of urban logistics will be given.

from stakeholder to stakeholder, which is necessary since other factors are influencing the stakeholders differently. In addition, two experts have completed the interviews in writing, which constitutes a risk that they have provided pre-formulated responses. In case of telephone interviews there is no such risk. Furthermore, this study is limited to the German market. A cross border market perspective would include more stakeholders, especially authorities from the European Union, in order to get a better overview of the political situation. Different social, ecological, technical and economic factors can play a role here as well and could reveal further potential challenges and chances. An example could be that other European countries are ahead in the field of electric mobility and drive technology, in comparison to Germany. The biggest limitation is that we cannot cover the customers in the expert interviews and that information about the customers can only be obtained through the questionnaire for the companies. Since the customer is one of the most important stakeholder in urban logistics, this is a strong limitation of the study. Nevertheless, the results provide a good overview of the complex environment of urban logistics.

7. Conclusion and Outlook

The main goal of my empirical work was to uncover various conflicts and synergy potentials of the stakeholders in urban logistics and to carve out the possible challenges and opportunities for CEP service providers. For this purpose, I conducted a total of 10 interviews with different stakeholders of the urban logistics sector, including representatives from authorities, manufacturers & suppliers, freight transport operators and the online trade & retail. The questionnaire is based on four dimensions with social, ecological, technological and economic levels. The outcome is that a potential for conflicts prevails between the individual stakeholders in urban logistics. Differences in interests and objectives exist especially in the relationships between the authorities and the freight transport operators and manufacturers & suppliers, as the companies see their business models threatened by possible political restrictions. In addition, they often feel neglected by the cities. They feel the cooperation with the authorities as one-sided, since they demand a lot from the freight transport operators and the manufactures & suppliers, while at the same time avoiding compromises or desired requests from the two stakeholders. But there is also a great potential for conflict between the two stakeholders freight transport operators and manufactures & suppliers. Particularly with regard to drive and vehicle technology, the freight transport operators feel abandoned by the vehicle manufacturers. However, there are also some potentials for synergies between the individual stakeholders. The city and the retailers

pursue the same goal by trying to design the city center more attractive to customers and residents. The tensions in the context of urban logistics represent challenges and chances for the CEP service providers. The main challenge for the CEP service providers is that there are no or only a few compatible alternative drive technologies available that can help to achieve their environmental goals. Another challenge for the CEP service providers is the use of suitable areas for possible micro hubs in the cities. The smart use of the areas turns out to be difficult as the areas in the cities are often scarce and coveted. The lack of dialogue with the cities also plays a role and represents a challenge for the CEP service providers. On the other hand, the CEP service providers have the chance to make a virtue out of necessity and can take the initiative to prevail over market deficits. A good example is the development of the StreetScooter, which shows the potential for success of such initiatives.

In order to resolve the identified conflicts of interests and to successfully implement scientifically supported pilot projects, joint meetings between the authorities, CEP sector, manufacturers & suppliers and retail trade are necessary. The overall conclusion is that partnerships between urban logistics stakeholders are essential in making new measures of urban logistics a success.

The most important section of the CEP service chain will continue to be the last mile. It is definitely necessary to keep an eye on the urban logistics, especially due to constantly ongoing changes and new trends of the e-commerce. Beyond the discussion paper, the current and new delivery concepts of the CEP service providers should be observed and analyzed, in order to make further findings. In particular, such relevant showcase projects like in Nuremberg can help. In addition, machines and robots could play an important role in the delivery stage of the last mile in the future. New approaches and strategies should be considered here to meet the ever-growing demand of urban logistics. Even for the decoupling of traffic, the automated technologies could play a role for the last mile in the future. An example for this could be the use of drones to deliver packages on the last mile. But also the trend that we will buy our foods online will represent challenges for the CEP service providers in the future, as these particular consignments are even more time-critical and require special delivery conditions in comparison to the conventional packages. From the point of view of the CEP service providers, it is important to keep an eye on the environment of urban logistics, in order to react to such trends at an early stage. This is the only way for CEP service providers to acquire a first mover advantage, which helps them to be successful in the long term on the strong competitive market in the CEP industry. It will be interesting to see what will happen after the national parliamentary elections in Germany and what impact the election's results will have on urban logistics. For the

next year, the federal government has provided approximately 500 million € for the reduction of air pollution in the cities, to the municipalities (cf. Süddeutsche Zeitung, 2017). These sustainable mobility funds are used for eligible projects. Here it will be interesting to see which projects will benefit from the subsidies and to which extent it will open the doors for the electric mobility in urban logistics.

The use of new and existing optimization models can support the CEP service providers to get a better overview of how they can use vehicles with new drive technologies better during their daily tours. All new ideas and projects on urban logistics should be accompanied and supported by optimization models. In this context, other European countries should also be considered, as these are often ahead of the German market in the field of alternative drive technologies and new logistical concepts. In addition, it should be examined whether customers are willing to pay more for a more sustainable and environmentally friendly package service. To get more information about the customers, a quantitative research on customer acceptance would prove to be appropriate. With these further research approaches, the CEP service providers are in a position to better understand their business environment.