

HOME DELIVERY: CONCEPT AND CHARACTERISTICS

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Abstract: Due to the development of e-commerce and specific customer habits and requirements, in recent decades an increasing number of companies offer home delivery service, which is the flow of goods from the business to the consumer (B2C) at the end of the supply chain (“last mile”). The main characteristic and difference of home delivery in relation to other ways of supplying customers/households (traditional customer purchase, “click & collect” purchase, door-to-door sales) is the engagement of companies in picking/physical preparation and delivery of ordered goods to customers. Delivery characteristics depend on a number of factors and circumstances, preferences, goals and interests of stakeholders (customers, companies, governments), but there is also a strong interdependence, with the type of goods having a dominant influence on other delivery characteristics. Planning, organization and implementation of the process of ordering, picking, delivery and return of goods are a serious challenge for companies’ logistics and information systems, generate high costs, increase freight transport and have a significant impact on the environment. Therefore, delivery characteristics are an important area of research and optimization of systems that implement this service. This paper analyzes the concept, basic characteristics and criteria for structuring home deliveries. In this way, the systematization of basic scientific knowledge about home delivery was performed and the basis for future research of various aspects of this field was created.

Keywords: home delivery, last mile, B2C, concept, characteristics, criteria, structuring.

1. Introduction

There are different ways to supply households. Prior to the emergence of supermarkets and large retail chains, door-to-door sales, regular scheduled home delivery of milk and other groceries from local stores were common practice (Gould, 1998; Browne *et al.*, 2001; Hays *et al.*, 2005). Mass use of cars, expansion of the network of supermarkets and retail chains, significantly change the supply of households. Supermarkets offer lower margins for goods that are traditionally

delivered to customer home address. In addition, there is a development of a wide range of different types of goods. This encourages customers to realize the supply independently and almost completely suppresses home delivery. The offer of goods that generates specific logistical demands, primarily in terms of dimensions and values (furniture, white goods, etc.), and the development of new forms of ordering goods (mail, telephone) enable the survival of home delivery, but to a much lesser extent. In parallel with the magnification and differentiation of supply and demand and

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the growth of consumerist habits, there is an accelerated technological development. The emergence of the Internet, as one of the main achievements of this development, has enabled the development of the concept of e-commerce, which in recent decades has transformed the relationship between companies and customers. Encouraged by the development of e-commerce, companies are expanding their business from a physical to an online channel (“click & mortar”) and re-establishing home delivery services, but in significantly different circumstances and with different, often unpredictable effects on the environment and stakeholders.

Home delivery or last mile delivery is the supply chain phase that includes the activities by which goods are physically moved to the customer (Agatz *et al.*, 2008b). As such, it represents the flow of goods between the company and the customer (B2C). Such flows differ in relation to the flows realized in the traditional distribution system between companies (business to business - B2B): producers, wholesalers and retailers (Du *et al.*, 2005; Van Duin *et al.*, 2016). Namely, B2B flows are characterized by a large volume, more efficient use of means of transport and other resources and a higher degree of determinism in terms of place, time, amount of demands, etc. (Visser *et al.*, 2014). On the other hand, due to the number and spatial dispersion of customers (Tadić & Veljović, 2020a) and the characteristics of the demands, B2C flows have significantly lower efficiency (Van Duin *et al.*, 2016). Divergent distribution structure, a large number of small orders, heterogeneous and changing customer demands are serious challenges for delivery service providers (Tadić *et al.*, 2017; Moroz & Polkowski, 2016; Du *et al.*, 2005).

There are a number of potential benefits of

home delivery for customers, companies and society (Cairns, 1996): making company profits, keeping community shops/spirit going, encouraging the purchase of local produce, reducing car traffic and providing social services (services for people who are unable to move: old, the sick, the disabled, persons under house arrest, persons who do not own means of transport, persons in remote and inaccessible areas etc.). The importance of home delivery is especially pronounced in the conditions of impossible movement, which was confirmed during the COVID-19 pandemic (Hobbs, 2020). In the conditions of home isolation, home deliveries enabled the supply of households and the survival of shops, restaurants and other companies that provide this service. In addition to when necessary, delivery is applied in order to increase customer satisfaction (Morganosky & Cude, 2000), to save time and avoid the traditional way of shopping due to crowds, specific logistical demands etc. (Browne *et al.*, 2001). Also, research shows that the application of some variants of home delivery or their combination with the traditional way of shopping contributes to a significant reduction in costs compared to the purchase that is realized exclusively in the traditional way (up to 43%, Punakivi & Saranen, 2001). On the other hand, there are numerous shortcomings, problems and challenges in the application of home delivery. Last mile delivery is the most expensive part of the supply chain (Vanelslender *et al.*, 2013; Kuhn & Sternbeck, 2013; Fernie *et al.*, 2010; Gevaers *et al.*, 2009). Fragmentation of shipments, which is inherent in home delivery, can lead to an increase in freight transport (Cárdenas *et al.*, 2017; Taniguchi & Kakimoto, 2004), and thus to congestion, harmful emissions, noise, security threats in residential areas, etc. The consequences

of these effects are particularly pronounced in central urban areas, given the high concentration of different functions (housing, trade, tourism, etc.) (Tadić, 2019). Also, the specificity and fluctuations of demand and the challenges of the logistics system for the realization of deliveries can lead to serious problems, and even bankruptcy and termination of companies (Fernie *et al.*, 2010; Campbell & Savelsbergh, 2005; Kämäräinen & Punakivi, 2002). Therefore, delivery characteristics are an important area of research and optimization of systems that implement this service.

This paper analyzes the concept and basic characteristics of home delivery. The main contribution and goal of the paper is the systematization of basic scientific knowledge about home delivery. Also, based on the characteristics of deliveries, the criteria for their structuring are defined, which created the basis for future research on various aspects of this area.

The paper is organized as follows. After the introduction, a review of the literature dealing with the concept, significance, effects and characteristics of home delivery is given. Chapter 3 deals with the concept and definitions of home delivery and last mile delivery. Chapter 4 analyzes the characteristics and criteria for structuring home deliveries. After that, conclusions and directions of future research are given.

2. Literature Review

In recent decades, a growing number of papers have addressed the concept, significance, effects, characteristics, structuring and classifications of home delivery. Numerous papers provide definitions of home delivery (Agatz *et al.*, 2008b; Browne *et al.*, 2001) and

last mile delivery (Lim *et al.*, 2018; Wohlrab *et al.*, 2012; Lindner, 2011; Gevaers *et al.*, 2009; Allen *et al.*, 2007). The importance and effects of home delivery and e-commerce as their primary generator have also been the subject of numerous studies, primarily in the context of freight transport (Visser *et al.*, 2014; Gevaers *et al.*, 2014; Esser & Kurte, 2005; Taniguchi & Kakimoto, 2004; Hesse, 2002), environmental impacts (Brown & Guiffrida, 2014; Edwards *et al.*, 2009; 2010a; 2010b) and social role (Cairns, 1996).

The subject of research are also the characteristics of delivery. Customer satisfaction with the service is most directly influenced by the end point of delivery and the method of receiving the goods. Although the home address is the most common end point of delivery, in a very small number of papers, households are analyzed in more detail as the place of receipt of goods (Tadić & Veljović, 2020a). On the other hand, the attention of a large number of researchers has been drawn to collection and delivery points (CDPs) (Van Duin *et al.*, 2016; Morganti *et al.*, 2014a; 2014b; Weltevreden & Rotem-Mindali, 2009; Weltevreden, 2008; McLeod *et al.*, 2006). Two types of CDPs that exist in practice are discussed in the papers: attended (Song *et al.*, 2009) and unattended (Yuen *et al.*, 2018; Iwan *et al.*, 2016). Equal attention of researchers as the end point of delivery has the method of receiving goods (Punakivi, 2003; McKinnon & Tallam, 2003). Deliveries can be made in the presence (attended delivery) (Agatz *et al.*, 2008a) or without the presence of the customer (unattended delivery) (Fernie & McKinnon, 2009; Xu *et al.*, 2008). Several papers analyze different solutions for unattended delivery: the use of reception and delivery boxes (Kämäräinen *et al.*, 2001; Punakivi *et al.*, 2001) and delivery to the trunk of the customer's vehicle

(Reyes *et al.*, 2017; Ozbaygin *et al.*, 2017). Speed (Dablanc *et al.*, 2017; Hausmann *et al.*, 2014) and delivery time (Klein *et al.*, 2019; Agatz *et al.*, 2011; Yaman *et al.*, 2012; Campbell & Savelsbergh, 2006) have similar significance, but significantly less attention from researchers in relation to the previous characteristics. In many studies, delivery characteristics have been analyzed by different types of goods (Gevaers *et al.*, 2009; Daduna & Lenz, 2005; Browne *et al.*, 2001), and grocery delivery has attracted the greatest attention from researchers (Durand & Gonzalez-Feliu, 2012; Campbell & Savelsbergh, 2005; Lin & Mahmassani, 2002; Yrjölä, 2001; Punakivi & Saranen, 2001). The place and technology of picking are also very often analyzed in the literature (Hays *et al.*, 2005; Murphy, 2003; De Koster, 2002; Kämäräinen & Punakivi, 2002). Researchers are particularly interested in drop-shipping concept of delivery, which involves picking at the manufacturer's location and direct delivery to the customer (Gan *et al.*, 2010; Ayanso *et al.*, 2006). Numerous papers are dedicated to different delivery executors: courier, express and parcel services (CEPs) (Park *et al.*, 2016; Ducret, 2014; Menge & Hebes, 2011) and crowd-workers (Arslan *et al.*, 2018; Carbone *et al.*, 2017; Devari *et al.*, 2017; Wang *et al.*, 2016; Mehmman *et al.*, 2015). Ordering and paying systems have been considered without going into details, except for electronic ones, which have become increasingly important in recent decades (Morganti *et al.*, 2014b). Return flows in home delivery have been analyzed in several papers (Tadić & Veljović, 2020b; Bernon *et al.*, 2016; Morganti *et al.*, 2014b; Browne *et al.*, 2001). A large number of papers analyze e-commerce and home delivery in the context of urban areas (Dablanc *et al.*, 2017; Visser *et al.*, 2014; Gevaers *et al.*, 2014; Ehmke & Campbell, 2014; Ehmke

& Mattfeld, 2012; Durand & Gonzalez-Feliu, 2012; Gevaers *et al.*, 2011), and a significantly smaller number of papers also address delivery in rural areas (Morganti *et al.*, 2014a; Boyer *et al.*, 2009). The smallest number of studies deals with frequency and area of delivery in terms of coverage (local, regional, national, etc.) (De Koster, 2003).

3. The Concept of Home Delivery

Numerous terms are related to the delivery of goods to customers, i.e. to households. They have a similar meaning, but emphasize certain aspects: last mile(s) delivery, final delivery, home delivery, residential delivery, door-to-door delivery, doorstep delivery, consumer direct service delivery, B2C e-commerce delivery, extended supply chain etc. The terms last mile delivery and final delivery indicate a place in the supply chain (SC). SC that involves the delivery of goods to the customer is sometimes called a last mile SC or extended SC (Boyer *et al.*, 2003). Home delivery, residential delivery, door-to-door delivery and doorstep delivery specify the end point of delivery. The term consumer direct service delivery emphasizes direct interaction with customers, while B2C e-commerce delivery also refers to e-commerce as the basic generator of home delivery. Some of these terms are more common in the literature (e.g. last mile delivery, final delivery, B2C e-commerce delivery), while some are more commonly used in the market (e.g. doorstep delivery).

Along with the term last mile delivery, in the literature, but also on the market, the term home delivery dominates. These terms, their interpretations and definitions differ in terms of comprehensiveness and are used in different contexts. The different level of coverage of the term last mile refers to

the parties involved (B2C, consumer to consumer - C2C), the supply chain segment, the starting and ending point of delivery, flow executors etc. According to Allen *et al.* (2007), last mile delivery is the logistics element of the fulfilment process, expressed through various ordering systems, including B2C and C2C transactions. On the other hand, Gevaers *et al.* (2009), Wohlrab *et al.* (2012) and Lim *et al.* (2018) limit last mile delivery to B2C trade. Early definitions refer to the last mile as “extension of supply chains directly to the end consumer” (Punakivi *et al.*, 2001; Boyer *et al.*, 2005; Kull *et al.*, 2007; Lim *et al.*, 2018). According to Lindner (2011), last-mile delivery involves “a series of activities and processes that are necessary for the delivery process from the last transit point to the final drop point of the delivery chain”. The final drop point can be the store, company, factory, or residence of the customer (Dablanc *et al.*, 2013). However, although the term “last mile” itself indicates a narrow geographical area, marking the last transit point as the starting point of last mile delivery can significantly reduce the meaning of this term and change the context in which it is most commonly used. Thus, the last transit point can be the customer’s neighbor’s household, the customer’s workplace or the CDP. In this case, the term “last mile” does not cover the complexity of the organization of delivery on the part of the supplier, but means a very short segment, which is usually realized by the customer. Therefore, Lim *et al.* (2018) the term last mile denotes the segment from the order penetration point to the final consignee’s preferred destination point. The order penetration point indicates the point of the stock, at which the customer order activates the order fulfilment process (Oldhager, 2003; Fernie & McKinnon, 2009). Also, although most often, the term last mile logistics is not only related to

delivery, but also to other ways of supplying the household, including the traditional way of procurement, door-to-door sales and “click & collect” procurement (Slabinac, 2015; Agatz *et al.*, 2008b; Daduna & Lenz; 2005). In this context, last mile logistics has a broader meaning than the term home delivery, which clearly indicates that the goods are being sent to the customer’s residence or place nearby (Punakivi, 2003; Fernie & McKinnon, 2009). Despite the nuances in the interpretation, the existing definitions of the last mile connect the understanding of this term as the last part of the delivery process (Lim *et al.*, 2018).

Home delivery in a narrower sense implies direct delivery to the customer’s home address (Morganti *et al.*, 2014b; Gevaers *et al.*, 2009), and in a broader sense delivery that can be realized directly or through other points near the home address (neighbor’s household, workplace, CDP, drop off company etc.) (Visser *et al.*, 2014; Punakivi, 2003). Browne *et al.* (2001) emphasize the difference from traditional shopping and define home delivery as the delivery of goods to a home address or other location of the customer’s choice, made by companies rather than by customer. The involvement of the retailer/producer in the organization of household supply flows is the basic feature and the difference of home delivery in relation to other forms of supply in the last mile. Unlike the traditional method of procurement (customer picking and delivers the goods to the household), the “click & collect” variant (retailer/manufacturer prepares the customer’s order and the customer realizes the delivery to the household), and door-to-door sales (where the retailer delivers goods to the household, and the customer then selects/picks them), when delivered to the home

address, the retailer/manufacturer is involved in both the goods picking and the organization of its delivery to the household. The retailer/manufacturer can deliver the goods independently, by hiring a logistics provider or a crowd worker, to the customer's home address or other locations. Although some definitions exclude the participation of the customer in the realization of deliveries (Browne *et al.*, 2001), he most often realizes the delivery of goods from CDP and other locations to the home address. Thus, home delivery can be defined as direct or indirect delivery of goods to the customer home address, which is partially or fully realized by the retailer, manufacturer or third party (logistics provider, crowd worker).

4. Characteristics of Home Deliveries

The characteristics of home delivery affect the level of service, the level of demand and customer satisfaction, efficiency, costs and profitability of the delivery organizer, as well as the environment in which these processes take place. Some of the characteristics and parameters of delivery are almost completely controlled by the organizer (e.g. start point, return flows) (Vanelslander *et al.*, 2013), and others are primarily related to customer decisions (e.g. end point of delivery) (Lim *et al.*, 2018), but most of them depend on a number of circumstances and factors related to different stakeholders.

One of the key characteristics of home delivery, which is very little discussed in the literature, is the connection between the process of ordering, payment, picking and taking over products, i.e. between flows of information, money and goods (Tadić & Veljović; 2020a). These processes/flows can be spatially and temporally separated or connected. Gardrat *et al.* (2016) indicate

that the spatial and temporal separation of the purchase and taking goods are the basic characteristics of home delivery. At the same time, these characteristics represent the main differences between home delivery in relation to traditional buying and door-to-door sales. Delivery is realized after in-person or remote ordering, and the goods are taken at the home address or other locations agreed between the customer and the delivery organizer. Spatial and temporal separation is further expressed with the development of new concepts related to different places and methods of ordering, payment, order picking and taking goods and different delivery executors, described in the following points. Spatial and temporal separation of the processes, which is often inherent in home delivery, makes numerous benefits, but also risks for both the customer and the retailer and other stakeholders. For example, the spatial and temporal separation of ordering and order picking/physical preparation may result in the delivery of goods that by type, quality, quantity and other parameters do not match the ordered, and these parameters can be much easier to control in the case of traditional and door-to-door selling. Also, the separation of ordering, payment and taking goods allows for various abuses by the delivery organizer/executor, customer or other persons. The risks are especially pronounced when paying online and unattended delivering (using a reception box, delivery box, placing the goods in front of the customer's facility etc.). Namely, the supplier can claim that he delivered the goods, even though he did not do so, or that he did not receive the money, even though the online transaction was realized, just as the customer can claim that he did not receive the goods, even though the receipt was realized. Also, other persons can steal the goods that were delivered without the presence of the customer.

However, although the development of new sales channels develops forms of purchase that by their nature imply the spatial and temporal separation of key processes (online ordering from the house - pick-up in the store, ordering in the store - home delivery, etc.), home delivery does not it must necessarily imply the separation of all processes. The term home shopping indicates that the customer places the order at home (or in other locations except the store), where he can also receive the ordered goods. One of the basic benefits of this delivery for the customer is the lack of need for mobility and absence of difference between the place of ordering and taking goods. The spatial separation of these processes can also be questioned

in the case of regular scheduled deliveries. During one delivery, the customer and the delivery executor can agree on the realization of the next delivery, whereby ordering and taking over the goods are performed at the same place. Also, payment is usually spatially and temporally related to the processes of ordering or taking over goods.

By analyzing and systematizing the basic characteristics of home deliveries, the criteria for their structuring can be singled out (Fig. 1). There is an interdependence between the characteristics/criteria, and the type of goods has the most pronounced influence on other delivery characteristics (Table 1).

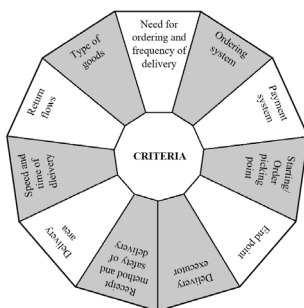


Fig. 1.
Criteria for Structuring Home Delivery

The characteristics of the goods and the way they are used affect the need for ordering and the frequency of delivery. Non-food, durable goods are ordered by the customer when the need arises and they are delivered independently of other deliveries that the retailer realizes for the same customer. The customer can also order non-durable, consumer goods when the need arises, but since the needs for these goods are constant and much more predictable, they are often delivered at a predetermined frequency, which completely or partially eliminates

ordering activities. The characteristics of the goods also affect the ordering system. Standardized low value goods are suitable for remote ordering (online, telephone, mail, etc.), unlike shopping goods (clothing, footwear, etc.), large goods (furniture, white goods, etc.), high-value items (gold items, high-value jewelry and electronics etc.) and goods characterized by differences between product units (fruits, vegetables, flowers, etc.), which customers more often personally choose and order in the store, in order to have a complete insight into its characteristics.

Table 1
Influence of the Type of Goods on Other Characteristics of Home Delivery

Type of Goods Characteristics	Non-durable Goods (food, cosmetics, hygiene and cleaning products, other household consumables, flowers, etc.)	Small Durable Goods		Large Durable Goods	
		Low Value Goods (books, CDs, clothes, shoes, etc.)	High Value Goods (jewelry, electronics, etc.)	High Value Goods (e.g. some building materials)	High Value Goods (furniture, white goods, etc.)
Need for Ordering	Ordering when the need for goods arises (e.g. delivery of prepared food) or regular scheduled delivery of goods (partially or completely without ordering) that has a constant dynamics of consumption (e.g. grocery delivery)	Ordering when the need for goods arises		Ordering when the need for goods arises	
Frequency of Delivery	There is no regularity of deliveries in time or the customer requires a high and predetermined frequency	Low frequency, there is no regularity of deliveries in time		Low frequency, there is no regularity of deliveries in time	
Ordering System	Usually online, but it is also realized in-person in store (e.g. fruit, vegetables, flowers) or in the household during regular scheduled delivery (e.g. milk)	Online, by phone, mail or in person in store	Usually in person in store	Online, by phone or in person in store	Usually in person in store
Payment System	Online/mobile payment, using a credit card or cash payment	Online/mobile payment, using a credit card or cash payment		Usually using a credit card or cash payment	
Starting/Order Picking Point	Usually a store, but it can also be a logistics center of the retailer	Usually the logistics center of the retailer or the location of the manufacturer, but it can also be a store		Store, retailer's logistics center or manufacturer's location	
End Point	Customer's home address	Customer's home address, neighbour's household, customer's workplace, CDP		Customer's home address	
Executor	Usually retailer/manufacturer	Usually CEPs or crowd-worker	Usually retailer	Usually retailer/manufacturer	
Method of Goods Receipt	Attended or unattended delivery (using reception or delivery box)	Attended or unattended delivery (using mailbox, delivery to CDP etc.)	Usually attended delivery	Attended or unattended delivery (access of the worker to the household facility with the approval of the customer)	
Delivery Speed	Require high speed	Not require high speed		Not require high speed	
Delivery Area	Usually a local, urban area	The goods do not limit delivery area		The goods do not limit delivery area	
Return Flows	Low rate of return of goods, higher rate of return of packaging and logistics units, complex realization of flows	Higher rate of return of goods, easier realization of flows	Low return rate due to personal order. and increased risk of theft or damage	Low return rate, except for unused building material	Low return rate and complex realization of flows

The type and value of goods also affect the payment system. Thus, customers are rarely paid online for high-value goods, when remote ordering goods, because there is a risk of fraud or inability to return the money in case of damage to the goods and (or) customer dissatisfaction. The type of goods also affects the place of picking, i.e. the starting point of delivery. Non-durable, consumer goods are sold in supermarkets, where they are usually picked before delivery. Deliveries of durable goods can also be made from stores (especially in the case of personal ordering), but are more often made from the retailer's logistics center or directly from the manufacturer (Browne *et al.*, 2001; Agatz *et al.*, 2008b; Fernie & McKinnon, 2009). The end point of delivery and the method of receiving the goods also largely depend on the type, characteristics and value of the goods. Goods of large dimensions and (or) value are most often delivered to the home address in the presence of the customer (Weltevreden, 2008; Campbell & Savelsbergh, 2006). Perishable goods also require such delivery or application of adequate reception or delivery boxes that are attached to the outer wall of the customer's facility. Low value and small goods, which do not generate specific logistical requirements, are suitable for delivery to other points (CDP, neighbor's household, customer's workplace) or unattended delivery, using mailboxes, putting goods in front of the customer's facility etc. The choice of delivery executor also depends on the type, value of the goods and the logistical demands it generates. For the delivery of durable small goods, retailers usually hire CEPs (Browne *et al.*, 2001), and the delivery of non-durable and large durable goods is usually realized independently. For delivery of low value goods, the retailer can hire a crowd-worker, i.e. individuals who realize the delivery with their own resources,

and their engagement for the delivery of high value goods brings the risk of theft (Devari *et al.*, 2017). The specific requirements generated by some types of goods also affect the speed and area of delivery (Browne *et al.*, 2001; Gevaers *et al.*, 2009; Joeress *et al.*, 2016). Thus, perishable (e.g. food) and time-sensitive goods (e.g. flowers, daily newspapers) require fast delivery, which is most often realized only in the local, urban area (Fernie & McKinnon, 2009). Finally, the type of goods affects the return rate and the complexity of the realization of return flows. Due to complex logistics requirements and high delivery costs in relation to product margins, food and other non-durable goods are very rarely returned to the supplier, but the delivery of these goods often generates return flows of packaging and logistics units (Tadić & Veljović, 2020b). Durable items of high value and (or) large dimensions are also rarely returned to the supplier due to specific logistical requirements (except for unused low-value building materials), while return flows of durable items of small dimensions are more frequent and much simpler.

5. Conclusion

In recent decades, due to the development of the Internet and e-commerce, an increasing number of companies offer a home delivery service. Unlike traditional and "click & collect" purchases, which are realized by the customer, and door-to-door sales, home delivery involves engaging companies in picking/physical preparation and delivery of ordered goods to the customer's home address or location nearby. Delivery characteristics depend on a number of circumstances and stakeholder factors. The analysis of the characteristics of home delivery is important both in order to achieve benefits for customers and companies, and in

the context of coordination and optimization of logistics flows in the area and their impact on the community and the environment.

In this paper, the concept and basic characteristics of home delivery are analyzed. The paper systematically collects the basic knowledge about the characteristics of home delivery, which achieves the basic goal and contribution of the paper. Also, based on the analysis and systematization of the characteristics of home delivery, the criteria for their structuring have been defined, which has created the basis for future research in this area.

Below are some of the directions of future research. The structuring and classification of home delivery according to the criteria defined in the paper and the analysis of the advantages, disadvantages and applicability of different models of home delivery are the next steps in the systematic research of the area. The capacity, efficiency and ability of the logistics system to respond to complex and changing requirements in the short (speed, reliability of delivery, etc.) and long term (increase in online shopping, seasonal demand, holidays, etc.) should also be the subject of future research.

Humanitarian home delivery, which is realized by charitable, social, rescue, local government services, may also be the subject of future research. The research of deliveries of humanitarian and commercial character, which are realized due to the disabled mobility of customers, is especially important having in mind the current, but also possible epidemics in the future. On the other hand, the attention of scientists should be focused on home delivery in the context of sure economic consequences of the COVID-19 pandemic (Gevaers, 2020).

In this sense, the key questions related to the role of home delivery in the future are: whether and to what extent the delivery service will be applied in the future, what will be the price of delivery and whether they will be a luxury and additional customer satisfaction or necessary way of household supply?

In addition to the economic, environmental and social aspects play a very important role in considering home delivery. Analyzes of the impact of different delivery models on the volume of passenger and freight transport, congestion, traffic safety in residential areas, harmful gas emissions, noise etc. are a wide field for future research.

In addition to the retailer, i.e. the delivery service provider, in future research of home delivery, a greater focus on the customer should be expected. In addition, a special challenge is to compare home deliveries with other forms of household supply (traditional purchase in the realization of the customer, “click & collect”, door-to-door sales).

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