

## THE EMERGENCE OF THE SHARING ECONOMY IN LAST-MILE LOGISTICS

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### Abstract

*The previously thriving e-commerce sector gained further momentum starting from 2020 due to the responses to COVID-19. However, this also carried several negative externalities, as customers ordered from various merchants, with different couriers delivering the goods, often involving supply chains spanning multiple continents. Simultaneously, customer expectations increased. This meant that logistics processes placed a significant burden on the environment, considering the impacts of transportation and packaging materials. The sharing economy could offer a solution to the challenges posed by last-mile logistics, but this approach is less widespread. In our study, we examined how popular crowdshipping solutions are among consumers. By analyzing the available questionnaire, we sought to determine whether these preferences are related to consumers' educational background, income level, place of residence, age, or genders correlate with consumers' educational background, income level, place of residence, age, and gender.*

**Keywords:** e-commerce, Last-Mile, crowdshipping

**JEL:** R40, M31

### Introduction

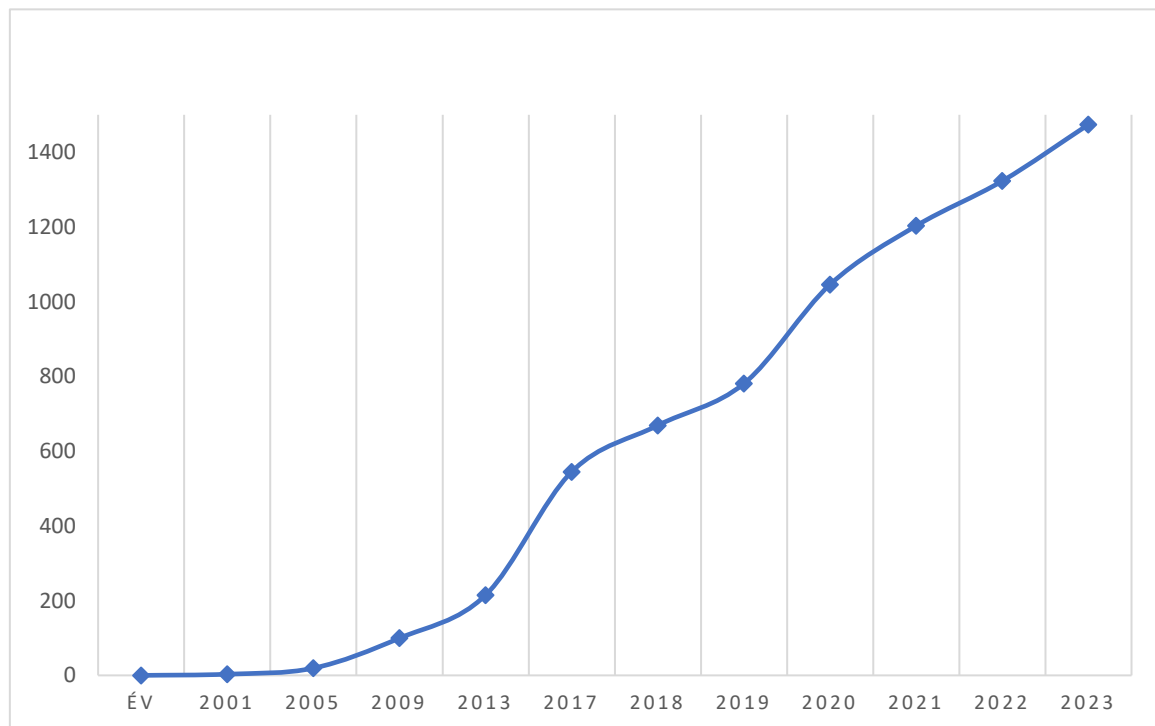
The pandemic situation caused by COVID-19, which began in March 2020, along with the regulatory restrictions introduced as a result, significantly affecting retail, has brought about major changes in consumer habits and increased the importance of online sales channel. New customer segments emerged among online shoppers, providing an excellent opportunity for market players to strengthen their positions.

E-commerce in Hungary reached a turnover of HUF 1,046 billion in 2020, representing a 45% increase compared to the previous year and accounting for 8.5% of the retail sector. The number of orders increased by more than 37%, surpassing 52 million. In terms of average spending, typical basket values in 2020 amounted to HUF 17,000, which is 20% higher than in 2019. The number of active online shoppers reached 3.38 million in 2020, an increase of 80,000 compared to the previous year (GKID, 2021).

Further growth was observed in 2021, with e-commerce turnover reaching HUF 1,200 billion, accounting for 10.5% of the retail sector. This translated to 68 million domestic orders, primarily driven by an increase in purchase frequency (an average of 20 orders per year). The FMCG sector was the engine of growth, showing a 43% expansion in this area in 2021. It is also noteworthy that 78% of the 6.5 million active internet users shop online, with 3.7 million purchasing products (GKID, 2022a).

However, the report for 2022 indicates a decline, attributed to high inflation, rising food prices, the Russian-Ukrainian conflict, and high energy costs (GKID, 2022b). In 2023, growth stagnated, with domestic online retail reaching a turnover of HUF 1,323 billion. This accounted for 77.1 million orders, primarily resulting from an increase in purchase frequency (21 times per year) (GKID, 2023).

The turnover of domestic e-commerce is illustrated in Figure 1.

**Figure 1: Domestic e-commerce turnover trends between 2001 and 2023, in billion HUF.**

*Source: Authors' own editing based on GKID 2023*

The sharing economy can also play a role in last-mile logistics processes, a concept known as crowdshipping. The primary research conducted is related to this topic.

The research objective was to examine, based on our sampling, whether there are differences in willingness to participate in the community-based solution of crowdshipping processes, either as a crowdshipper or as a sender, depending on age, gender, place of residence, income, or level of education. To achieve this, we formulated the following two hypotheses:

There is no significant difference in the willingness to participate in crowdshipping processes based on age, gender, place of residence, income, or level of education.

Placing importance on green solutions in last-mile processes does not necessarily predispose someone to participate in crowdshipping processes.

## Literature Review

The term last mile refers to the stage in logistics where shipments are delivered from the final transfer point to the customer. The concept of the "last mile" originates from telecommunications, where it described the last segment of wired telephone lines connecting individual subscribers. The term has since been adopted in logistics, gaining increasing significance with the rise of international trade, particularly e-commerce (Janinhoff et al; 2023).

The initial stages of delivering goods to the buyer typically involve large-scale transport via sea or rail until the ordered products reach a port or distribution center close to the recipient. Last mile delivery refers to the process in logistics whereby goods are transported from the distribution center to the recipient, who may be a store, restaurant, another business, or the end consumer. This final stage is the least cost-efficient part of the delivery process, accounting for 28%—or in extreme

cases, up to 53%—of the total cost of goods delivery. This proportion increases as customer locations become more dispersed and frequent small-batch orders become common. In such cases, the principle of economies of scale does not apply, and the per-shipment labor, equipment, and fuel costs become exceptionally high (Nagy & Kutasi, 2020).

Since e-commerce tends to concentrate in urban environments, there is significant overlap between city and last-mile logistics. Typically, last-mile logistics revolves around five main themes: increasing demand, sustainability concerns, rising costs, evolving customer expectations (e.g., shorter time windows or delivery times), and challenges in finding suitable labor (Boysen, Fedtke, & Schwerdfeger, 2021).

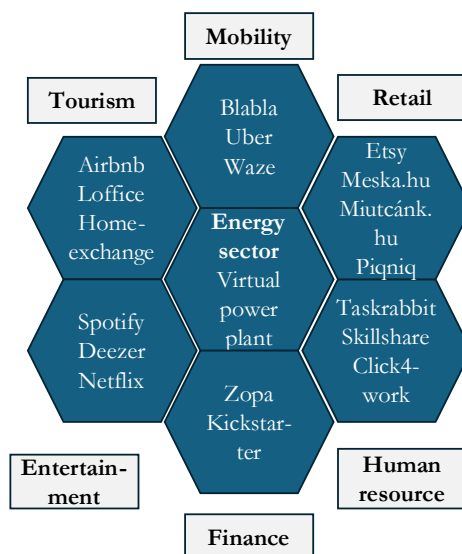
As the economy evolves, new solutions continuously emerge, requiring adaptation by individuals and companies alike. Nagy's 1998 study already addressed the sharing or community economy, which, in essence, is not new. Sharing surplus resources has existed in society since ancient times as a form of prosocial behavior (Nagy J., 1998). The essence of the sharing economy is that consumers can access a product when needed without having to purchase it permanently to meet their temporary needs (Nagy Z., 2016).

A sharing economy as an economy based on sharing or a community economy—can be a tool in the fight to protect human living spaces by reducing consumption and rationalizing consumption habits," states an introductory publication on the subject (Pónusz & Kolonics, 2020). An economic model where individuals directly exchange underutilized goods or services with one another, either free of charge or for payment (Botsman & Rogers, 2011).

Alex Stephany identified key characteristics of the sharing economy, including economic value (created through exchange via money or barter), underutilized assets, online accessibility (enabled by the internet), and reduced need for ownership (Stephany, 2015). Sundararajan described the sharing economy as "crowd-based capitalism." He argued that this approach is strongly market-driven, as the sharing economy creates markets. This enables the exchange of goods and the emergence of new services, leading to higher levels of economic activity. His second characteristic highlights high-impact capital, which allows more efficient utilization of assets, skills, and time within the sharing economy. The third characteristic is a shift toward decentralized networks, as opposed to centralized institutions. Here, capital and labor come from individuals rather than corporations or government providers. The fourth feature is the blurring of personal and professional boundaries, where offerings of products and services often become commercialized, even in areas previously considered personal. The fifth trait is the blurring between full-time and occasional work, independent and dependent employment, and work and leisure (Sundararajan, 2016).

The sharing economy involves three key participants: the provider (who shares their product), the consumer (who temporarily uses the product), and the platform facilitating the transaction between them (Kumar, Lahiri, & Dogan, 2017). Sharing processes can be categorized into four groups based on their purpose: resale of goods, increasing utilization of durable goods, exchanging services, and sharing production tools (Schor, 2016).

The previously mentioned study by Pónusz and Kolonics categorizes community-sharing practices into industry sectors, supplemented with Hungarian examples (Figure 2).

**Figure 2: International and domestic examples by significant industries in Hungary**

Source: Pónusz-Kolonics 2020.

There are several well-defined phenomena that have contributed to the rise of the sharing economy: such as the economic crisis, changes in consumer behavior, the rapid increase in population, the spread of online platforms and social networks, and the fact that markets can now expand with minimal capital costs. This is because opening a new business no longer necessarily requires physical properties, and more and more companies are appearing exclusively in the online space. This also means that an increasing number of businesses are becoming sharing companies, meaning they don't only sell their products permanently, but also offer the option of renting them periodically (Gansky, 2010; Frenken, 2017). In his study, Koen Frenken projects three possible futures within the sharing or collaborative economy. One scenario, which has already been realized on many platforms, is the aforementioned capitalization. In this case, the sharing economy does not differ significantly from the traditional one, as capital owns the profit, and workers are exploited in the same way, without the usual regulations applying to them. As a result, uncertainty increases. The greening of the economy does not happen in this scenario, as companies are not interested in sustainable development, just as they were not in the past. A potential solution is for the state to take on the redistribution role, increasing appropriate taxes on capital and reducing the burden on labor through contributions. With the right tax system and strong labor representation, this could help entrepreneurs' security and benefits. If the government taxes ownership, it could encourage sharing over ownership, thus contributing to the sustainability of the economy. The third possible future is the one originally expected from the sharing economy. In this scenario, everything is in the hands of the participants, who share the profit and determine the wages. There are two possible forms: either everything is owned by the participants (platform, car, database), or the shared goods are individually owned (e.g., an apartment), but the platform and the profit from it belong to the community (Frenken, 2017).

The sharing economy gained new momentum after the 2008 economic crisis when the sharing of products, ideas, technologies, and resources began. (Belk, 2014). This type of business model

appears in logistical solutions and problems, such as parking, solving its issues, the difficulties in transportation like crowded roads, and the deficiencies in infrastructure that appear mostly during peak hours (Melo, Macedo, & Baptista, 2019). To simulate accurate results, Barcelo developed the AIMSUN model, which is suitable for presenting real-world results (Barcelo, 2002).

The transportation sector is also constantly developing to make city and last-mile logistics more efficient (Tavasszy, 2018). We can see that there are still some obstacles in the development of last-mile processes, such as the production and afterlife of electric car batteries, which are still criticized. Moreover, vehicles are still quite expensive. Hydrogen-powered vehicles face high costs for installing charging stations, and the technology does not meet green criteria. Drones face reliability and load-bearing concerns, as well as limited delivery distances. Self-driving vehicles raise concerns about traffic safety. These uncertainties support the spread of Crowdshipping (Buldeo Rai, Verlinde, & Macharis, 2018). The sharing economy could be one solution appearing in e-commerce last-mile processes and can also reduce environmental impact. There is a definition: "The sharing economy is an economic and social system that allows community access to goods, services, data, and knowledge, so that users can access resources when they need them, without having to purchase them" (Forsense.hu, 2020).

The origins of Crowdshipping can be traced back to hitchhiking or car rental. It is based on the realization that a significant portion of our tools and equipment are idle for most of the time, and ownership alone comes with substantial costs. The rise of the sharing economy has been greatly supported by digitalization and the spread of the internet (Forsense.hu, 2020), (Bank, 2022), (Lazányi, Veress, & Bársony, 2020). The emergence of crowdshipping can be traced back to around 2010, primarily appearing in the United States: Postmates, Zipments, Deliv, Roadie, with PostRope in Australia, Renren Ku-aidi in China, and Nimber in Norway. Trunks in the Netherlands and PiggyBaggy in Finland were also available (McKinnon, 2016). Amazon also offers such a service, Amazon Flex (Amazon, 2023). Walmart created the Spark delivery service. DHL launched the MYWay platform in 2013 (Halzack, 2015), (Walmart.com, 2018), (Pressebox, 2013).

The Crowdshipping process involves three participants: (1) the crowdshipper, who is an individual or last-mile driver, (2) the customer, and (3) the platform provider. What is interesting about the service type is that the platform provider is not necessarily the retailer or the transporter but can be an independent party who connects the customer with the transporter (driver). The platform (which can also be a mobile app) has a complex task: connecting the consumer with the appropriate transporter, providing the delivery price, ensuring all necessary information for the parties, and assisting the consumer in decision-making, such as through reviews and feedback. It can also provide route planning for the deliverer, thus optimizing the delivery route (Ciobotaru & Chankov, 2021), (Frehe, Mehmman, & Teuteberg, 2017), (Atasoy, Schulte, & Steenkamp, 2020), (Carbone, Rouquet, & Roussat, 2017), (Punel & Stathopoulos, 2017). One publication discusses the application of taxi drivers as crowdshippers (Li, Krushinsky, Reijers, & Van Woensel, 2014).

It is important to discuss the advantages and disadvantages of the service. In addition to cost reduction, there is a decrease in traffic on the roads, which has positive ecological effects. A negative aspect is that the reliability of delivery is lower than with conventional logistics services. Timely delivery can also be an issue, as well as damages or lack of control. The shippers themselves are also exposed to risks, as in many cases they do not know what they are shipping due to the participating Crowdshipping transporters. Capacity is difficult to plan, and scaling traffic can be problematic (McKinnon, 2016). Since the crowdshipper is typically an individual rather than a company, issues may arise regarding invoicing, billing, quality responsibility, and the presence of the appropriate liability insurance. However, route optimization is the key to success in Crowdshipping, but due to the community solutions, this is challenging, as many conditions must be taken into

account, such as the product size, weight, value, among others. A thorough ex-ante analysis may be needed to assess whether the service is feasible and to determine whether people are willing to use the service or participate in crowd-based cargo transportation, depending on the specific analysis context (Gatta, Marcucci, Nigro, & Serafini, 2019), (Marcucci, Le Pira, Carrocci, Gatta, & Pieralice, 2017).

Several studies have explored the factors influencing individuals' willingness to participate in crowdshipping. One notable publication by Le, Ukkusuri, Xue, and Woensel (2021) identified three key determinants: sociodemographic characteristics, experience with road transportation, and social media usage. Sociodemographic factors such as age, income level, education, and employment status play a crucial role in shaping attitudes toward crowdshipping. For example, younger individuals or those with flexible working hours might be more open to participating as crowdshippers, viewing it as a way to earn extra income or engage in the sharing economy.

Experience with road transport—including familiarity with navigation, driving comfort, and access to a vehicle—also significantly impacts the likelihood of participation. People who frequently drive or are already engaged in delivery-related tasks may find crowdshipping a natural extension of their routine. Social media usage reflects a person's digital engagement and openness to technology-driven solutions. Those active on platforms like Facebook, Instagram, or logistics-related apps may be more exposed to crowdshipping opportunities and more inclined to trust the system, given its community-based nature. (Ukkusuri, Xue, & Woensel, 2021).

Amazon Flex is one of the largest Crowdshipping platforms, launched in 2015. As a crowdshipper, the following conditions must be met: the driver must be over 21 years old, have a valid driver's license, and use a suitable vehicle (appropriate size, technical condition, valid license). Currently, the service is available in 100 cities in the USA (December 2023). Those who own their own vehicle and have the motivation and time can register via the Amazon Flex app for delivery tasks at their preferred time. When the registered user is available in the app, they can see nearby opportunities and estimate how much income they can earn. On average, a driver earns \$18-\$25 per hour. After every refueling, 6% is credited to an Amazon Flex card, 2% for every Amazon and Whole Food Market product sold, and 1% for other products (Amazon, 2023), (Dawkins, 2023).

In 2013, DHL launched the Myway platform in Stockholm, which aimed to support last-mile solutions. It provided services not only to consumers who were flexible regarding delivery times but also to those who wanted to earn some extra income. After consumers order a product and select a location, the product is transported to the appropriate depot, and a crowdshipper located near the depot decides which products to deliver. Preliminary customer tests showed a positive reception (Logisticsmatter, 2013).

A similar last-mile solution is used by Walmart in the U.S. under the name Spark. The application is supported by the Bring logistics platform. In addition, an internal system is available to drivers to assist with navigation and planning. Spark has partnered with Delivery Drivers Inc. (DDI), which handles the recruitment and management of independent delivery drivers. DDI also provides services related to recruitment, screening, payment, accounting, and other services for drivers who are paid for deliveries. DDI also offers services such as helping drivers understand the order process, group discounts, and an entrepreneurship program that helps drivers start their own small businesses (Hofbauer, 2018), (Walmart.com, 2018).

In the U.S. FMCG market, numerous other players use Crowdshipping solutions, such as Postmates, DoorDash, and Grubhub, and even Aldi (Dolan, 2022).

A similar solution was created in China in 2011 with Renren Kuaidi, which is no longer available (Pitchbook.com, 2023).

In 2012, Nordic started operating in Norway, and in March 2020, it launched a simple and intuitive business solution that provides fixed lead times and financial predictability for businesses, as all prices are shown before placing an order. A mobile application is available for couriers containing tasks for the entire Norwegian territory, making it an excellent tool for business expansion, and with the Bringer app, they can easily organize and complete tasks (Sustainabilityguide.eu, 2020), (Nimber.com, 2023).

Bambizz is a global crowdshipping solution, allowing people to participate from anywhere, which has a practical advantage for those in the countryside or less populated areas.

In Hungary, VIDDL offers this service in the following cities: Budapest, Győr, Székesfehérvár, Debrecen, and Kecskemét (VIDDL, 2023).

## Materials and Methods

The research objective was defined as investigating whether there are differences in the assessment of willingness to participate in crowdshipping processes based on age, gender, residence, income, or education level. To achieve this, we formulated the following two hypotheses:

There is no significant difference in willingness to participate in crowdshipping processes based on age, gender, residence, income, or education level.

The importance of green solutions in last-mile processes does not predetermine participation in crowdshipping processes.

A 14-question survey was published between August 11 and 24, 2023, via social media platforms. The research included Likert-scale and closed-ended questions. During this period, we received a total of 211 responses. Three respondents were excluded because they reported not using online ordering. Excel and SPSS were used for data analysis. The selected analysis methods included cross-tabulation, the Kruskal-Wallis test, and the Mann-Whitney test.

We chose cross-tabulation because it is a well-known and widely used method for examining relationships between two or more variables, and it presents the combined frequency distribution of those variables. The analysis is simple, and the results are easily interpretable. In cross-tabulation, we investigate whether there is a relationship between two nominal or ordinal variables (Gyulavári et al., 2017).

To examine the median differences between groups, the Kruskal-Wallis test was applied. The goal of this test is to compare samples from three or more independent populations. These samples are measured results of the same dependent variable in different groups. We used samples from different groups that measured the same phenomenon. The medians of the variables are compared to determine the differences between the results of independent measurements. The test assumes that the samples come from non-normal distributions, so the variable being tested should be either continuous (metric scale) or measured on an ordinal scale. However, for the analysis of gender differences, this test was not used (since there were only two variables); instead, we used the Mann-Whitney test (Statokos, 2023).

The distribution of respondents by gender, age, residence type, education level, and income level is presented in Table 1.

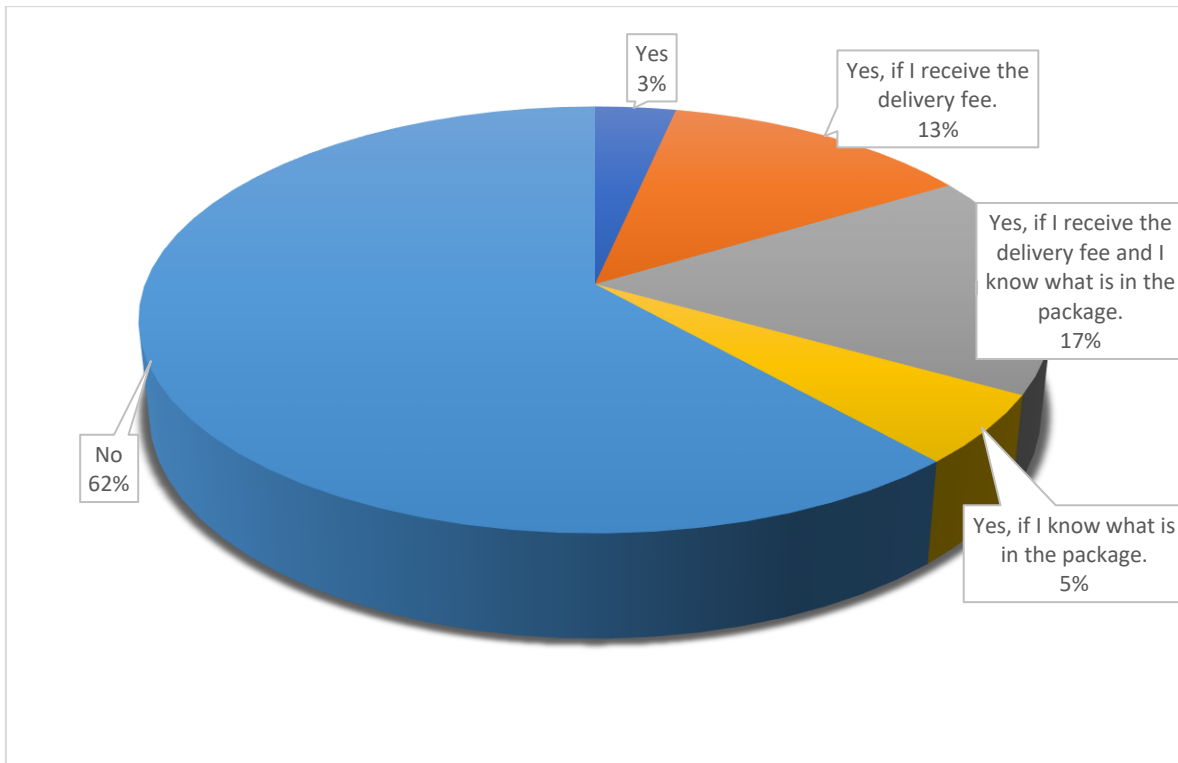
**Table 1. Gender:**

Women	130	63%
Man	78	38%
<b>Age:</b>		
Between 18 and 29 years old	10	5%
Between 30 and 39 years old	41	20%
Between 40 and 49 years old	93	45%
Between 50 and 9 years old	44	21%
Over 60 years old	20	10%
<b>Residential type:</b>		
Capital	40	19%
County seat	103	50%
City	41	20%
Town	17	8%
Village	7	3%
<b>Education:</b>		
Postgraduate education	13	6%
Postgraduate education	107	51%
Secondary school diploma	66	32%
Vocational training	20	10%
Eight years of primary education	2	1%
<b>Household income</b>		
More than 800,000 HUF	51	25%
Between 700 001HUF and 800 000HUF	25	12%
Between 600 001HUF and 700 000HUF	23	11%
Between 500 001HUF and 600 000HUF	27	13%
Between 400 001HUF and 500 000HUF	28	13%
Between 300 001HUF and 400 000HUF	31	15%
Less than 300 000HUF	23	11%

*Source: Authors' own editing, n=208 2023*

A representative study cannot be conducted based on the sample; however, it may be suitable for drawing conclusions.

Our first question was whether participants would engage in the crowdshipping solution as a package deliverer (Figure 3).



**Figure 3: Would the respondent be a Crowdshipper?**

*Source: Author's own compilation. n=208 2023*

62% of the respondents would not like to participate in the processes as a crowdshipper.

In the next section, to test the second hypothesis, we examined using SPSS whether differences in preferences between groups can be measured based on gender, education level, frequency of purchasing, type of residence, age, and household income regarding whether they would be a crowdshipper. For gender, we applied the Mann-Whitney test, and for the other factors, we used the Kruskal-Wallis method. The results are shown in Table 2.

**Table 2. Would the respondent be a crowdshipper, by gender, age, income, education, and residence type.**

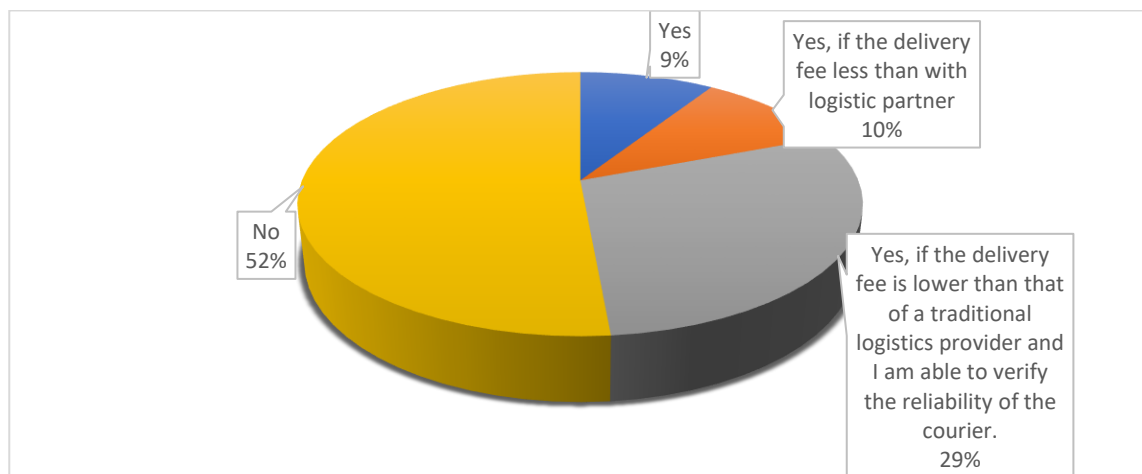
Hypothesis	Test	Result
There is no significant difference between genders regarding whether they would participate as a crowdshipper.	Mann-Whitney test result ( $Z=-2.259$ , $p=0.024$ ) indicates no significant difference between the groups' medians, thus confirming the hypothesis.	Confirmed
There is no significant difference based on ordering frequency regarding whether they would participate as a crowdshipper.	Mann-Whitney test result ( $Z=1.740$ , $p=0.783$ ) indicates no significant difference between the groups' medians, thus confirming the hypothesis.	Confirmed
There is no significant difference based on education level regarding whether they would participate as a crowdshipper.	Kruskal-Wallis test result ( $H=6.417$ , $p=0.170$ ) indicates no significant difference between the groups, thus confirming the hypothesis.	Confirmed

There is no significant difference based on residence type regarding whether they would participate as a crowdshipper.	Kruskal-Wallis test result ( $H=1.161$ , $p=0.883$ ) indicates no significant difference between the groups, thus confirming the hypothesis.	Comfirmed
There is no significant difference based on the respondent's age regarding whether they would participate as a crowdshipper.	Kruskal-Wallis test result ( $H=2.145$ , $p=0.709$ ) indicates no significant difference between the groups, thus confirming the hypothesis.	Comfirmed
There is no significant difference based on household income regarding sustainability expectations related to packaging materials.	Kruskal-Wallis test result ( $H=2.093$ , $p=0.911$ ) indicates no significant difference between the groups, thus confirming the hypothesis.	Comfirmed

*Source: Author's own compilation. n=208-2023*

The analysis revealed that a significant portion of respondents are not interested in becoming crowdshippers, and this reluctance does not differ based on age, income, shopping frequency, type of settlement, or level of education. This analysis supports our first hypothesis. There are several possible reasons for this. On the one hand, the service is relatively unknown among consumers; on the other hand, they may also be somewhat distrustful of it.

In the following section, we examine the respondents' willingness to participate as parcel senders. This is illustrated in Figure 4.



**Figure 4: Willingness to send a parcel via a crowdshipping solution**

*Source: Author's own compilation. n=208-2023*

More than half of the respondents do not wish to send a package in crowdshipping processes. To examine the second hypothesis, in the following section, we used SPSS to investigate whether differences in preferences between groups can be measured based on gender, education level, purchasing frequency, type of residence, age, and household income, regarding whether they would send a package in a crowdshipping process. For gender, we applied the Mann-Whitney test, and for the other factors, we used the Kruskal-Wallis method, the results of which are shown in Table 3.

**Table 3. Kruskal-Wallis method results**

Hypothesis	Test	Result
There is no significant difference between genders regarding whether they would send a package using a crowdshipping solution.	Mann-Whitney test result ( $Z=-1.524$ , $p=0.124$ ). No significant difference between the group medians was found, thus the hypothesis is confirmed.	Confirmed
There is no significant difference in ordering frequency regarding whether they would send a package using a crowdshipping solution.	Mann-Whitney test result ( $Z=11.554$ , $p=0.021$ ). No significant difference between the group medians was found, thus the hypothesis is confirmed.	Confirmed
There is no significant difference based on education level regarding whether they would send a package using a crowdshipping solution.	Kruskal-Wallis test result ( $H=2.093$ , $p=0.719$ ). No significant difference between the groups was found, thus the hypothesis is confirmed.	Confirmed
There is no significant difference based on type of residence regarding whether they would send a package using a crowdshipping solution.	Kruskal-Wallis test result ( $H=1.103$ , $p=0.894$ ). No significant difference between the groups was found, thus the hypothesis is confirmed.	Confirmed
There is no significant difference based on the respondent's age regarding whether they would send a package using a crowdshipping solution.	Kruskal-Wallis test result ( $H=6.376$ , $p=0.173$ ). No significant difference between the groups was found, thus the hypothesis is confirmed.	Confirmed
There is no significant difference based on household income regarding whether they would send a package using a crowdshipping solution.	Kruskal-Wallis test result ( $H=5.103$ , $p=0.531$ ). No significant difference between the groups was found, thus the hypothesis is confirmed.	Confirmed.

*Source: Authors' own editing, n = 208.-2023*

The analysis showed that a significant portion of the respondents do not want to send a package via a crowdshipping solution (WHAT MIGHT BE THE REASONS FOR THAT?), and there are no differences based on gender, age, income, purchase frequency, type of residence, or education level. This analysis confirms the second hypothesis. There are several possible reasons for this. On the one hand, the service is relatively unknown among consumers; on the other hand, they may also be somewhat distrustful of it.

## Conclusions and Recommendations

E-commerce has undergone explosive growth over the past few decades. The pandemic in 2020-21 provided a new momentum for the industry, opening new markets and introducing new players to the e-commerce space. At the same time, the competition to attract consumers intensified. The

availability of convenience services became more important than same-day delivery, shorter delivery windows, real-time package tracking, and the increasing alternatives in delivery methods, such as package terminals, reception and delivery boxes, trunk delivery, and numerous other innovative solutions. The growth in e-commerce traffic brings with it several negative externalities, primarily due to the increase in parcel numbers. Last-mile processes are financially and ecologically the most burdensome for the environment.

We see the rise of shared economy opportunities in many sectors, such as Uber or Oszkár. This model, known as crowdshipping, has the potential to mitigate the negative impacts of e-commerce. The public already involved in transportation could participate in last-mile processes. For this, only a willing shipper and recipient, a transporter, and a platform are needed. Successful practices can already be seen in companies like Amazon and DHL. The number of vehicles on the road decreases, and both parties could benefit from additional income. However, the convenience services already widely available in retail are only limitedly accessible in this model.

Regarding the research objectives related to crowdshipping, the first surprising result was that only 3% of respondents were willing to become crowdshippers. The majority, 62%, definitively answered "no." Some respondents indicated that they might consider it if they had sufficient information, such as knowledge of the contents of the package, alongside proper compensation. We used SPSS Mann-Whitney and Kruskal-Wallis tests to check whether gender, age, household income, education, or residence type made any difference in the willingness to become a crowdshipper. The results showed no significant differences between the groups, thus confirming the 1.hypothesis.

When it comes to whether respondents would be willing to ship packages in crowdshipping processes, 52% answered "no," while only 9% said "yes." The rest indicated that with proper security features and favorable conditions, they might be willing to try. Again, no significant differences were found between the groups based on gender, age, household income, education, or residence type, confirming the 2 hypothesis.

Although the research is not representative, it provides valuable insights for drawing conclusions. Despite the fact that there are successful examples of crowdshipping in several countries, this study shows no willingness to participate among the respondents. Many people don't fully understand what it entails or what benefits they could gain from it. Realistically, such a solution could work in larger cities like Budapest, Debrecen, and Szeged. The success of effective implementation will depend on the role of lawmakers and cities. It is also essential to encourage the participation of young people, as this could provide an excellent opportunity for supplementary income or even flexible work, similar to Amazon Flex. The advantages of shipping packages, such as lower fees and responsible thinking, should also be emphasized. However, a platform is needed that can compensate for the negative effects, where the crowdshipper's rating, package route, and fixed fees are visible in the app. Potential platform providers should be cautious, as no crowdshipping service has been successful in Hungary yet.

Since the sampling method used in this research is not representative, it limits the generalizability of the results.

## References

- Amazon. (2023): Driven by always being there for storytime. Forrás: <https://flex.amazon.com/> Accessed: 2024.12.13.
- Atasoy, B. – Schulte, F. – Steenkamp, A. (2020): Platform-Based Collaborative Routing using Dynamic Prices as Incentives. *Transportation Research Record: Journal of the Transportation Research Board*, 2674(10). <https://doi.org/10.1177/0361198120935>
- Bambizz.com. (2023): Bambizz.com. Source: Bambizz.com: <https://bambizz.com/en/> Accessed: 2024.12.13.
- Bank, M. N. (2022): Magyar Nemzeti Bank. Source: Sharing Economy: Közösségi gazdaság, mint lehetőség a háztartás bevételeinek növelésére: <https://www.mnb.hu/fogyasztovedelem/csaladizold-penzugyek/zold-penzugyi-megoldasok/zold-penzugyi-megoldasok-a-gyakorlatban/sharing-economy-kozossegi-gazdasag-mint-lehetoseg-a-haztartas-beveteleinek-novelesere> Accessed: 2024.12.14.
- Barcelo, J. (2002): Microscopic traffic simulation: A tool for the analysis and assessment of ITS systems. TSS-Transport Simulation System-Barcelona.
- Belk, R. (2014): You are what you can access: Sharing and collaborative consumption online. *Journal of Business Research*, 67, 1595–1600. <https://doi.org/10.1016/j.jbusres.2013.10.001>
- Botsman, R. – Rogers, R. (2011): *What's mine is yours -how collaborative consumption is changing the way we live*. London: Harper Collins.
- Boysen, N. – Fedtke, S. – Schwerdfeger, S. (2021): Last-mile delivery concepts: a survey from an operational research perspective. *OR Spectrum*, 43(1), 1–58. <https://doi.org/10.1007/s00291-020-00607-8>
- Buldeo Rai, H. – Verlinde, S. – Macharis, C. (2018): Shipping outside the box. Environmental impact and stakeholder analysis of a crowd logistics platform in Belgium. *Journal of Cleaner Production*, 202, 806–816. <https://doi.org/10.1016/j.jclepro.2018.08.210>
- Carbone, V. – Rouquet, A. – Roussat, C. (2017): The Rise of Crowd Logistics: A New Way to Co-Create Logistics Value. *Journal of Business Logistics*, 38(1). <https://doi.org/10.1111/jbl.12164>
- Caspersen, E. – Navrud, S. – Bengtsson, J. (2021): Act locally? Are Female Online Shoppers Willing to Pay to Reduce the Carbon Footprint of Last Mile Deliveries? *International Journal of Sustainable Transportation*, 16(12), 1144–1158. <https://doi.org/10.1080/15568318.2021.1975326>
- Ciobotaru, G. – Chankov, S. (2021): Towards a taxonomy of crowdsourced delivery business models. *International Journal of Physical Distribution & Logistics Management*, 51(5) 460–485. <https://doi.org/10.1108/IJPDLM-10-2019-0326>
- Dawkins, J. O. (2023): Business Insider. Source: Here's what it's like and how much it pays.: <https://www.businessinsider.com/amazon-flex-driver> Accessed: 2024.12.13.
- Dolan, S. (2022): Insiderintelligence.com. Source: Crowdsourced delivery explained: making same day shipping cheaper through local couriers: <https://www.insiderintelligence.com/insights/crowdsourced-delivery-shipping-explained/> Accessed: 2024.12.13.
- Flex (2023): Amazon flex. Source: Amazon flex: <https://flex.amazon.com/>
- Forsense.hu. (2020): Forsense.hu. Source: Megosztásos Gazdaság: <https://www.forsense.hu/megosztasos-gazdasag/> Accessed: 2024.12.13.
- Frehe, V. – Mehmman, J. – Teuteberg, F. (2017): Understanding and assessing crowd logistics business models – using everyday people for last mile delivery. *Journal of Business and Industrial Marketing*, 32(1), 75–97. <https://doi.org/10.1108/JBIM-10-2015-0182>

- Frenken, K. (2017): Political economies and environmental futures for the sharing economy. *Philos Trans A Math Phys Eng Sci*, 375 (2095): 20160367. <http://dx.doi.org/10.1098/rsta.2016.0367>
- Gansky, L. (2010): *The mesh: Why the future of business is sharing*. Penguin.
- Gatta, V. – Marcucci, E. – Nigro, M. – Serafini, S. (2019): Sustainable urban freight transport adopting public transport-based crowdshipping for B2C deliveries. *European Transport Research Review*, 11 (1). <https://doi.org/10.1186/s12544-019-0352-x>
- GKID. (2021): GKID. Source: 2020-ban három évet ugrott előre az e-kereskedelem: <https://gkid.hu/2021/03/25/2020-online-kiskereskedelem/> Accessed: 2024.12.13.
- GKID. (2022): GKID. Source: Közel 70 millió vásárlás pörgette tavaly az online kiskereskedelmet: <https://gkid.hu/2022/03/24/70-millio-online-vasarlas/> Accessed: 2024.12.13.
- Gyulavári, T. – Mitev, Z. A. – Simon, J. – Neulinger, Á. – Neumann, E. B. – Szűcs, K. (2017): *A Marketingkutató alapjai*. Akadémiai Kiadó. Budapest: Akadémiai Kiadó. ISBN 978 963 05 9888 0.
- Halzack, S. (2015): Amazon Flex: The retailer's Uber-like effort to bring you packages. Source: Washington Post: <https://www.washingtonpost.com/news/business/wp/2015/09/29/amazon-flex-the-retailers-uber-like-effort-to-bring-you-packages/> Accessed: 2024.12.13.
- Höfbauer, R. (2018): Progressivegrocer. Source: Walmart Relies on Crowdsourcing to Complete Grocery Delivery's Last Mile: <https://progressivegrocer.com/walmart-relies-crowdsourcing-complete-grocery-deliverys-last-mile> Accessed: 2024.12.13.
- Janinhoff L. – Klein R. – Sailer D. – Schoppa J.M. (2024): Out-of-home delivery in last-mile logistics: A review. *Computers & Operations Research*, 168, 106686. <https://doi.org/10.1016/j.cor.2024.106686>
- Kumar, V. – Lahiri, A. – Dogan, O. B. (2017): A strategic framework for a profitable business model in the sharing economy. *Industrial Marketing Management*, 69, 147–160. <https://doi.org/10.1016/j.indmarman.2017.08.021>
- Lazányi, O. – Veress, T. – Bársony, F. (2020): Megosztásos gazdaság – a megosztás vagy a fogyasztás tere? *Tér és Társadalom*, 34(1). <https://doi.org/10.17649/TET.34.2.3206>
- Le, T. – Ukkusuri, S. – Xue, J. – Woensel, T. (2021): Designing pricing and compensation schemes by integrating matching and routing models for crowd-shipping systems. *Transportation Research Part E: Logistics and Transportation Review*, 149 102209 <https://doi.org/10.1016/j.tre.2020.102209>
- Li, B., Krushinsky, D., Reijers, H., & Van Woensel, T. (2014): The Share-a-Ride Problem: People and parcels sharing taxis. *European Journal of Operational Research*, 238(1), 31–40. <https://doi.org/10.1016/j.ejor.2014.03.003>
- Logisticsmatter. (2013): Logisticsmatter. Source: DHL crowd sources deliveries in Stockholm with MyWays: <https://logisticsmatter.com/dhl-crowd-sources-deliveries-in-stockholm-with-myways/> Accessed: 2024.12.13.
- Marcucci, E. – Le Pira, M. – Carrocci, C. – Gatta, V. – Pieralice, E. (2017): Connected shared mobility for passengers and freight: Investigating the potential of crowdshipping in urban areas. 5th IEEE International Conference on Models and Technologies for Intelligent Transportation Systems (MT-ITS). <https://doi.org/10.1109/MTITS.2017.8005629>
- Mckinnon, A. (2016): Crowdshipping: a Communal Approach to Reducing Urban Traffic Levels? *Logistics White Paper*. <https://doi.org/10.13140/RG.2.2.20271.53925>
- Melo, S. – Macedo, J. – Baptista, P. (2019): Capacity-sharing in logistics solutions: A new pathway towards sustainability. *Transport Policy*, 73., 143–151.
- Nagy, J. (1998): Az érdekérvényesítő szociális. *Iskolakultúra*, 3.
- Nagy, S. – Kutasi, G. (2020): *Gazdaságdiplómia*. Budapest: Akadémiai kiadó ISBN: 978 963 454 598 9.

- Nagy, Z. (2016): *A közösségi gazdaság (sharing economy) és pénzügyi szabályozása*. MultiScience - XXX. microCAD International Multidisciplinary Scientific Conference. University of Miskolc: ISBN 978-963-358-113-1.
- Nimber.com. (2023): Nimber.com. Source: Nimber.com: <https://nimber.com/> Accessed: 2024.12.13.
- Pitchbook.com. (2023): Pitchbook.com. Source: Renren Kuaidi: <https://pitchbook.com/profiles/company/99137-71#overview>
- Pónusz, M., – Kolonics, P. (2020): Megosztásos gazdaság. *Glossa Iuridica*, pp. 315-334.
- Pressebox. (2013): Pressebox. Source: DHL crowd sources deliveries in Stockholm with MyWays: <https://www.pressebox.com/inactive/deutsche-post-ag-2/DHL-crowd-sources-deliveries-in-Stockholm-with-MyWays/boxid/622127> Accessed: 2024.12.13.
- Punel, A. – Stathopoulos, A. (2017): Modeling the acceptability of crowdsourced goods deliveries: Role of context and experience effects. *Transportation Research Part E: Logistics and Transportation Review*, 105, 18–38. <https://doi.org/10.1016/j.tre.2017.06.007>
- Schor, J. (2016): Debating the sharing economy. *Journal of Self-Governance & Management. Economics*. <https://greattransition.org/publication/debating-the-sharing-economy/>
- Statokos. (2023): Statokos. Source: Statokos: <https://www.statokos.com/nemparamteresprobak>. Accessed: 2024.12.13.
- Stephany, A. (2015): *The Business of Sharing-Making it in the New Sharing Economy*. London: Palgrave Macmillan.
- Sundararajan, A. (2016): *The sharing economy: the end of employment and the rise of crowd-based capitalism*. Cambridge, MIT Press, Cambridge: MIT Press.
- Sustainabilityguide.eu. (2020): Sustainabilityguide.eu. Source Sustainabilityguide.eu: <https://sustainabilityguide.eu/?guide=nimber> Accessed: 2024.12.13.
- Tavasszy, L. (2018): Predicting the effects of logistics innovations on freight systems: Directions for research. *Transport Policy*, 86. <https://doi.org/10.1016/j.tranpol.2019.11.004>
- VIDDL. (2023): VIDDL. Source: VIDDL: <https://viddl.hu/> Accessed: 2024.12.13.
- Walmart.com. (2018): <https://corporate.walmart.com/>. Source: Walmart Tests New Last-Mile Grocery Delivery Service: <https://corporate.walmart.com/news/2018/09/05/walmart-tests-new-last-mile-grocery-delivery-service> Accessed: 2024.12.13.
- Walmart.com. (2018): Walmart.com. Source: Walmart Tests New Last-Mile Grocery Delivery Service: <https://corporate.walmart.com/news/2018/09/05/walmart-tests-new-last-mile-grocery-delivery-service> Accessed: 2024.12.13.

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