E-COMMERCE CUSTOMER SERVICE A CHALLENGE
FOR CITY LOGISTICS

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Purpose: The aim of the article was to analyse and attempt to determine the scale of the use of new technologies in e-commerce customer service and to present trends and challenges in this area in city logistics. In addition, the article characterises the development of the e-commerce market between 2020 and 2023 and introduces the silhouette of the e-commerce customer.

Design/methodology/approach: A literature analysis, case studies and empirical data from industry reports and self-observation were used to develop the article.

Findings: The research concluded that new technologies are now an integral part of the e-commerce customer experience. Trends accompanying e-commerce in relation to city logistics, according to the author, are increased demand for 'last mile' delivery, green logistics and sustainable transport, automation and robotisation, flexible delivery models (crowdsourcing) and personalisation of services. Challenges facing modern urban logistics are the increasing demands of consumers, the complexity of delivery in 'last mile logistics', the need to adapt urban infrastructure to the changing environment, and environmental and regulatory constraints.

Research limitations/implications: The data collected and presented in the article on the development of e-commerce in Poland and globally covers the years 2020-2023.

Practical implications: The solutions presented in the article can improve the efficiency of logistics processes, optimise urban infrastructure, introduce technological innovations and support sustainable urban development. Furthermore, the information can support both companies and local governments in responding to the growing challenges of e-commerce customer service.

Social implications: The article can be used to improve the quality of life in cities, increase the availability of services, develop local markets and increase the awareness and involvement of residents in sustainable development activities.

Originality/value: The value of the article stems from its interdisciplinary nature - combining topics related to logistics, technology, ecology and urban planning. Its audience can range from private sector professionals, public policy makers and academics working together on solutions for sustainable development and urban management in the context of e-commerce development.

Keywords: customer service, city logistics, new technologies, e-commerce, development.

Category of the paper: Research paper.

Introduction

In recent years, the intensive growth of e-commerce, particularly evident between 2020 and 2023, has influenced the transformation of city logistics. With the increase in online ordering, customer needs for last-mile logistics service have increased, challenging cities in terms of infrastructure, ecology and delivery efficiency. The aim of this article is to provide an original analysis and attempt to determine the scale of the use of modern technology in e-commerce customer service and to identify trends and challenges in urban logistics. The article is enriched not only by new empirical data, but also by conceptual insights into the challenges for the future of cities and logistics.

The article adopts a diverse research methodology including literature analysis, case studies and empirical data from industry reports, which are complemented by the author's observations. The hypothesis is that technologies such as automation, robotisation, sustainable transport and crowdsourcing models not only contribute to improving delivery efficiency, but can also change the way we think about urban logistics from an environmental and social perspective. The novelty of the publication's findings lies in its interdisciplinary approach - integrating knowledge from the fields of logistics, technology, ecology and urban planning - a unique combination with relevance for both the private sector and urban policy.

The research presented has important practical implications that can contribute to optimising logistics processes and improving urban infrastructure management. In addition, the article can support local government units and companies working in the field of e-commerce customer service, as well as raise awareness among local residents about sustainability measures. With its innovative approach, the work brings value to professionals, public policy makers and academics involved in the development of city logistics in the age of digital transformation.
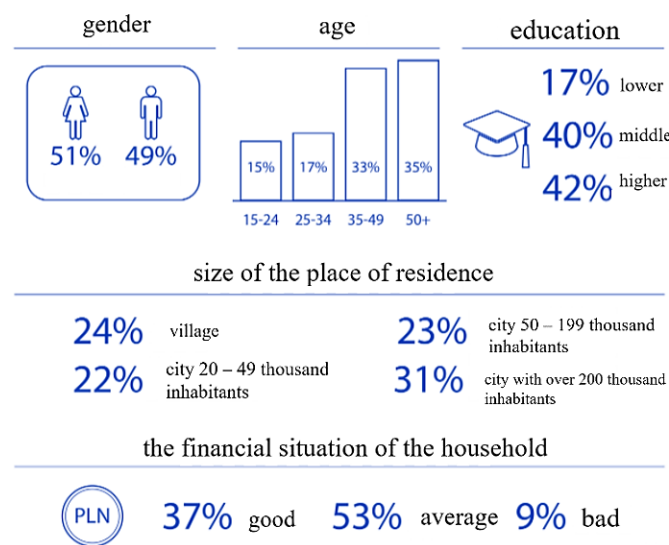
Characteristics of e-commerce

Electronic commerce, or e-commerce, is the exchange of goods, services and information using a computer network. According to Syarif et al. (2020), e-commerce is a subset of e-business including: commerce, business partnerships, customer service and recruitment. Therefore, e-commerce is considered to be not only web technology, but also database, technical data in databases, email and other non-technical forms of computers (product delivery systems and payment instruments). The Internet and information technology have contributed to technological advances, including the development of e-commerce. Today's Internet-enabled mobile devices have enabled consumers to access the online marketplace in real time.

As a result, they can shop from anywhere, at their convenience Wang et al. (2023) emphasise that e-commerce is the process of buying - selling goods and services over the Internet using electronic communication technology and information processing. Koe et al. (2020), defined e-commerce as the conduct of digital business transactions using the Internet.

The global value of the e-commerce market grew rapidly in 2020, following the outbreak of the Covid-19 pandemic, reaching US$10.36 trillion at that time. The E-commerce Statistics portal valued the global e-commerce market at USD 4.9 trillion in 2021 and more than USD 6.5 trillion in 2023, representing 22% of all global retail sales (E-commerce in Poland, 2020). Analysts at Marketsplash predict that e-commerce worldwide will grow at a 14.7 per cent CAGR (average annual growth rate) and will reach USD 27.15 trillion in 2027 (Vuleta, 2022). The emarketer.com portal reported that 78% of e-commerce users worldwide in 2023 shopped using mobile devices (70% opted for tablets, 67% for desktops or laptops). Among the most selected and purchased products online globally in 2023 were apparel, footwear, electronics, cosmetics, food products, books and multimedia. The average spend per online transaction was around US$2.6. The 2023 Worldwide E-commerce Forecast report stated that the main motivators for shopping in the global e-marketplace were accessibility (twenty-four hours a day), convenience and the ability to compare different offers at the same time. According to the Emarketer portal, 73% of global shoppers used different distribution channels throughout the shopping process. The most popular forms of payment in e-commerce according to emarketer.com included: credit cards (53%), digital payment systems (43%), debit cards (38%). On the other hand, the most popular shopping platforms were: Amazon, eBay, Alibaba (Emarketer Reports, 2023).

In Poland, the first online shops and auction platforms were established in the second half of the 1990s. Initially, online shopping was not popular. The sceptical attitude towards this form of shopping was due, among other things, to concerns about the safety of the money spent and the long waiting time for goods (Leloch et al., 2023). Today, the situation is very different. According to a Gemius report from 2023 (Gemius Report, 2022), online shopping has gained trust among the majority of Poles. This was linked to improved delivery services. 79% of respondents taking part in the survey conducted by the creators of this report declared that they had made an online purchase at least once in 2022 (51% of whom were women). This report also highlights that today's e-commerce users are mainly those born between 1995 and 2012 (Generation Z) (Miernik, 2024) and between 1980 and the end of the 20th century (Generation Y) (Bandura, 2022). Maksymilian Śleziak of the Ageno portal points out that Polish e-commerce is one of the fastest growing markets in Europe. He published the results of a quantitative study, which shows that 30 million people used the internet in Poland in 2023. 79% of them shopped online, of which 75% chose Polish online shops and 25% foreign ones. It was estimated that in 2023, the average Pole spent around PLN 1,600 per month online. 67% of respondents admitted that they used online shopping at least once a week. In addition, the authors of the study emphasised that 67% of the people surveyed were encouraged to shop online by the price, which they believed was lower online than in stationary shops (Śleziak,

2024). According to the Harbingers portal, the value of the Polish e-commerce market in 2023 was approximately PLN 120 billion. Economists predict that this value will increase in 2024 (E-commerce, 2024). In turn, PwC (a global firm offering audit, tax, advisory and consulting services) forecasts that the Polish e-commerce market will reach a value of 162 billion PLN by 2026 (Cheng et al., 2020; Report on the growing importance of e-commerce in Poland and Europe, 2023). The most popular e-commerce products in Poland in 2022 were: clothing, footwear, cosmetics, books, pharmaceutical products, sportswear, household appliances and white goods, and in 2023 they will be joined by food products. The characteristics of online consumers in Poland in 2023 are shown in Figure 1 (E-commerce in 2024 Trends, opportunities and threats, 2024).

Figure 1. Characteristics of online consumers in Poland in 2023.

Source: E-commerce w 2024 roku Trendy, szanse i zagrożenia (2024), The text comes from: https://harbingers.io/blog/e-commerce-w-2024-roku-trendy-szanse-i-zagrozenia, 27.04.24.

According to this report, 'E-commerce in 2024 - trends, opportunities and threats', the most frequently selected forms of delivery in Poland in 2023 were parcel machines (86% of respondents chose this type of delivery) and home/work courier delivery (62%). For online purchases, survey respondents were most likely to pay using quick transfers through payment services, mobile payments (BLIK) and payment by card (Figure 2).
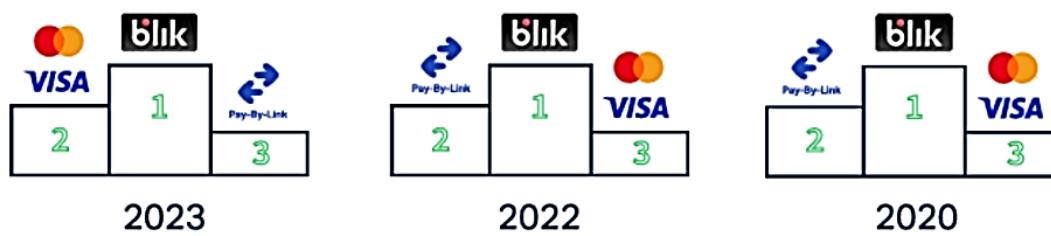
Figure 2. Distribution of survey respondents' answers on their favourite payment methods between 2000 and 2023.

Source: Stankowska (2023). Key statistics of the e-commerce market in Poland in 2023 and 2024. The text comes from: https://edrone.me/pl/blog/statystyki-e-commerce-polska

Among the various platforms, according to e-commerce statistics published on drone.pl in 2023, Poles most often chose: Allegro (86% of consumers), OLX (39%), Zalando (20%), Amazon (15%), Aliexpress (15%) (Stankowska, 2023).

The history and development of e-commerce is closely linked to e-commerce transactions and business models. The literature most commonly distinguishes six: Business-to-consumer (B2C), the most common form of e-commerce, in which companies sell directly to consumers using online trading platforms, websites and mobile applications. Business-to-business (B2B) involves companies selling goods and services to other companies (bulk purchases or supplier relationships). Consumer-to-consumer (C2C) occurs when consumers sell products or services to other consumers via online trading platforms, classified ads or auction sites. Consumer-to-business (C2B), the sale of products or services by consumers to businesses. Refers to independent contractors, consultants and small businesses selling specialist goods and services to them. Business-to-administration (B2A), the sale of goods and services to companies, government agencies or other public sector organisations. Includes: online tax return and procurement systems. Consumer-to-administration (C2A) is a model in which consumers interact with government agencies or other public sector organisations through online portals (paying taxes or accessing government services) (Lemańczyk at al. 2020). It is now increasingly being said that the B2B model is gradually replacing the human-to-human (H2H) model. It puts, at the focal point, the human being. This is because people want to be part of something big, have feelings and experience a whole range of emotions. They do not want to be excluded from wider activities, they want to be noticed and feel that their voice is important. Additionally, they want to understand and be individuals who make mistakes. The main focus of this model is that every business is made up of people. There is no business without people. The brands of companies become close to people and are actually friends that we like and come back to (Czerska, 2020; Revolution in marketing - H2H instead of B2B?, 2019; Oktaviani et al., 2022).

New technologies in e-commerce

According to Sonata (2019), e-commerce has grown rapidly in recent years and has become a significant part of the internet. Therefore, business organisations are changing their technology on a daily basis, to what is known as smart technology (Wang et al., 2023). Businesses are outdoing themselves in implementing new solutions, including those using AI (artificial intelligence). According to Ravindar et al. (2022), AI has become the answer to the problems of e-commerce organisations. It has made it possible to reach a wider audience, including those who are communicatively excluded or disabled. According to the 2023 Technology Trends Outlook report, the use of AI in e-commerce in 2022 contributed to the generation of $4.4 trillion in economic value. Analysts from McKinsey, on the other hand,

have indicated that this functionality will result in an additional 40% increase in economic value in 2024 compared to 2023. Which, in their view, will translate into more money being invested in companies to implement and develop artificial intelligence in e-commerce (E-commerce in 2024 Trends, Opportunities and Risks, 2024). AI in e-commerce is being used, among other things, to present personalised recommendations and display automated suggestions in the search engine related to their previous preferences (typed in the search engine). An example of the use of AI in e-commerce is the presence of virtual assistants that guide e-commerce users through the entire shopping process. Solutions of this type are used by The North Face, among others (AI in e-commerce. How artificial intelligence is changing the online retail industry, 2022). AI in e-commerce is combined with other technologies, for example virtual reality (AR). This allows online customers to try on products before they buy them, at home without having to turn up at a shop. CCC offers online customers to virtually try on shoes in an app, while Vision Express offers glasses. These solutions are popularly used by the fashion and interior design industries (E-commerce in 2024 Trends, opportunities and threats, 2024). Another technology using AI in e-commerce is NLP (Natural Language Processing). The process of using this technology involves accurately understanding the user's intentions and correctly processing the query in the browser (search engine) (Sleziak, 2024). Another technology is Visual Search (image search), which, using AI, provides an alternative to traditional search. It involves the user uploading a photo or screenshot of the item being searched for to the search engine, and the AI-based algorithm, after analysing what the image represented, is tasked with presenting the same or similar items to the user. The visual search option is offered by CCC, among others. Increasingly, text- or image-based search is being replaced by so-called voice search, which also works on the basis of AI. Chatbots are also an AI-based technology used in the e-commerce industry. They work by automating customer service by responding immediately to their needs. In addition, AI in e-commerce is used for website personalisation and 'product recommendation engines' (Panasiuk, 2022). This activity involves displaying dedicated product recommendations to users, tailored to their current needs (Bawack et al., 2022). The ageno.co.uk portal counted as the most important mobile technologies in e-commerce: PWA- web applications, provide users with an experience (user experience) similar to native mobile applications (responsiveness, speed, offline operation and the ability to save to the device's home screen). As another, he mentioned headless technology, which makes it possible to design a separate view of the webshop, mobile app and smartwatch version while operating them through a single backend system. In third place were: TikToks, reels and videos, which, according to the portal's authors, outclassed traditional inserted photos. According to data, the ageno.co.uk portal, reels accounted for 30% of the time spent by Instagram users in 2023. The portal's creators predict that in 2024, this value will increase by another several dozen %. Another technology used in e-commerce is Live

commerce, channels for selling products during a live broadcast. Also referred to as teleshopping 2.0, they are commonly used by the fashion and beauty industries (Sleziak, 2024). Therefore, it can be argued that social media play a special role in e-commerce today: Facebook, Instagram and Tik-Tok. These are platforms, creating spaces for the exposure of product offers, where demand is generated. The metaverse, also called Web 3.0, is a virtual, three-dimensional space based on a combination of technologies (augmented reality, blockchain, AI, IoT and digital twins). It works by building a reality that attempts to replace the physical dimension of social and economic interactions. This is a new era of virtual interaction in which cryptocurrencies and blockchain play a significant role as infrastructure to support unique digital economies (Nedunuri, 2023). This technology enables global borderless transactions and decentralised exchange of value using tokens (electronic devices issued by banks that generate codes to authenticate online operations) (Token - what is it and how does it work?, 2023) and NFTs (non-fungible tokens-unique cryptographic tokens created through blockchain technology) (Non-Fungible Token: What is it and how does it work?, 2023) as means of digital ownership. Examples of companies that have implemented the metaverse in e-commerce are: Flipkart, Gucci, Nike (Kuraś et al., 2024). The integration of payment systems to enable seamless transactions plays an important role in building metaverse.

E-commerce customer service - trends and challenges for city logistics

With the rapid growth of e-commerce, consumer demands for customer service are increasing, which directly influences changes in urban logistics. Both online and in the urban space, customers expect ever faster, more flexible and sustainable deliveries, which poses new challenges for logistics companies. According to the creators of the e-commerce trends 2024 blog, the main e-commerce trends for 2023 include: subscription commerce. It works by selling products or services at regular intervals in exchange for a recurring subscription fee. This type of distribution enables companies to receive a steady profit and gives them the ability to accurately estimate demand. Which can translate into reduced costs of acquiring new customers and increased loyalty of existing customers. The authors cited Netflix, Amazon Prime, Spotify, Office 365 and BeGlossy as examples of companies that have built their success on this type of commerce. They also pointed out that subscription sales work well for fast-moving consumer goods (FMCG): food products, cleaning products, cosmetics, water filters, contact lenses, pet food or accessories. Another trend in e-commerce is the sale of second-hand products (re-commerce). The popularity of buying second-hand items, according to the blog's authors, is linked to the increasing environmental awareness of consumers. Re-commerce is a trend that has recently become very visible in the fashion industry (success of the platforms:

Vinted, Zalando Pre-Owned). Another trend described is ecological e-commerce. Representatives of generations - millenials (generation Y, gradually entering the digital world) (Kaszuba-Piżuk, 2022) and gen Z (the digital world has always existed for them, what is more, they are the generation growing up in a world of modern technologies) (Rojewska, 2024) - are particularly sensitive to ecological issues. Therefore, they specifically point out that e-commerce should be based on ecological forms of delivery and continuous work on reducing returns (Sleziak, 2024). As well as reverse logistics, which in e-commerce consists of managing the process in which customers send back purchased products to the seller. Today's e-commerce users expect easy and hassle-free returns (Louis, 2024).

The dynamic development of e-commerce affects logistics, including city logistics. Today, the phenomenon of globalisation, structural and technological change is intensifying in urban areas. The flows of people and goods contribute to air pollution, congestion, traffic bottlenecks, noise and accidents in cities. According to Kalbarczyk (2019), urban logistics is a tool to solve a variety of difficulties in urban agglomerations. Nowakowska-Grunt et al. (2017), on the other hand, defined urban logistics as the process of managing the flow of: materials, cash and information in accordance with the needs and for the development of the city and taking into account the problem of environmental protection, under the assumption that the city is a social organisation oriented towards satisfying the needs of its customers - city residents. The infrastructure of city logistics consists of the following infrastructures: transport (e.g. roads, junctions), storage processes (e.g. depots, warehouses with equipment), telecommunications and data transmission in the city (Matusiak, 2022). City logistics is an important element of customer service in e-commerce. The realisation of one of the last distribution legs of an online customer's ordered product 'last mile logistics' is mainly carried out within cities. The level of end-customer satisfaction, fast delivery (same-day delivery), the possibility of flexible choice of time and place of collection (e.g. pick-up points, parcel vending machines) and real-time tracking of shipments are today's standards accompanying e-commerce customers. It can be concluded that city logistics in e-commerce is an intermediary, fostering the implementation of these standards with efficiency, rationality of operational costs using new technologies. In urban logistics, they are used, among other things, to automate warehouses (warehouse management systems -WMS), optimise delivery routes using algorithms (Internet of Things -IoT and artificial intelligence -AI), monitor and analyse data in real time.

Warehouses and storage are an integral part of e-commerce, without them it would be impossible for this industry to function. Efficient inventory management makes it possible to minimise costs, store and ensure product availability to customers. According to CBRE (Commercial Real Estate Services- a real estate advisory company), the Polish warehouse market is one of the fastest developing in Europe. In 2023, the total warehouse space in Poland

will increase by 12 per cent compared to 2022 and will amount to approximately 30.5 million sqm. The increase in e-commerce has translated into increased demand for warehouse space, especially in cities (urban warehouses and logistics-microhubs). In 2023, 780,000 sq m of warehouses were leased in Warsaw, 655,000 sq m in Katowice and 578,000 sq m in Wrocław. According to autopay.pl, warehouses located in strategic locations: close to major urban centres and transport hubs have gained in importance (Development of e-commerce as an opportunity to strengthen the warehouse market, 2024). This has made it possible to reduce lead times, which is extremely important, for example, in services such as same-day delivery. An example of a company that implements solutions of this type is Amazon, which has developed and continues to develop a network of microhubs in city centres around the world. This enables it to deliver quickly and reduces the need for large logistics centres outside cities (1000s of jobs. Amazon has launched its 11th logistics centre in Poland in the Silesian Voivodeship, 2024). The e-commerce portal included among the most popular forms of delivery in urban logistics in 2023: Out-of-home (OOH), the possibility to pick up an order at parcel machines or partner points. Click & collect, purchasing a product online and picking it up at a selected stationary shop (can be combined with parcel machine collection). An example of such a solution is the trekking shop outdoorzy.pl. Beneath the stationary shop is their 'own' parcel machine, where customers can collect products ordered online. Q-commerce, a sales model that involves the delivery of products in a maximum of a few tens of minutes after placing an order. Usually these are suppliers employed in the catering industry (Pyszne.pl, UberEats or Glovo moving by bicycle, scooter or on foot within cities). Associated with this type of delivery are so-called dark stores - micro-distribution centres, resembling shops filled with fast-moving goods (e.g. groceries), used for online orders. The authors of the article 'E-commerce in 2024 - trends, opportunities and threats' (E-commerce in 2024 Trends, Opportunities and Threats, 2024) predict that in 2024, excessive waiting times for the customer could mean up to 24 hours. In line with customer expectations, e-shops should aim for same-day delivery. This will make consumers feel satisfied with their shopping experience, which will translate into building a relationship between the customer and the shop (E-commerce in 2024 Trends, opportunities and risks, 2024). According to a report published on harbingers.io/blog/e, 86% of online shoppers in 2023 chose parcel machines as the delivery method they used most often. This was 12 p.p. higher compared to 2022. In contrast, the least frequently chosen form of delivery in 2023 included delivery to postal outlets (Figure 3).
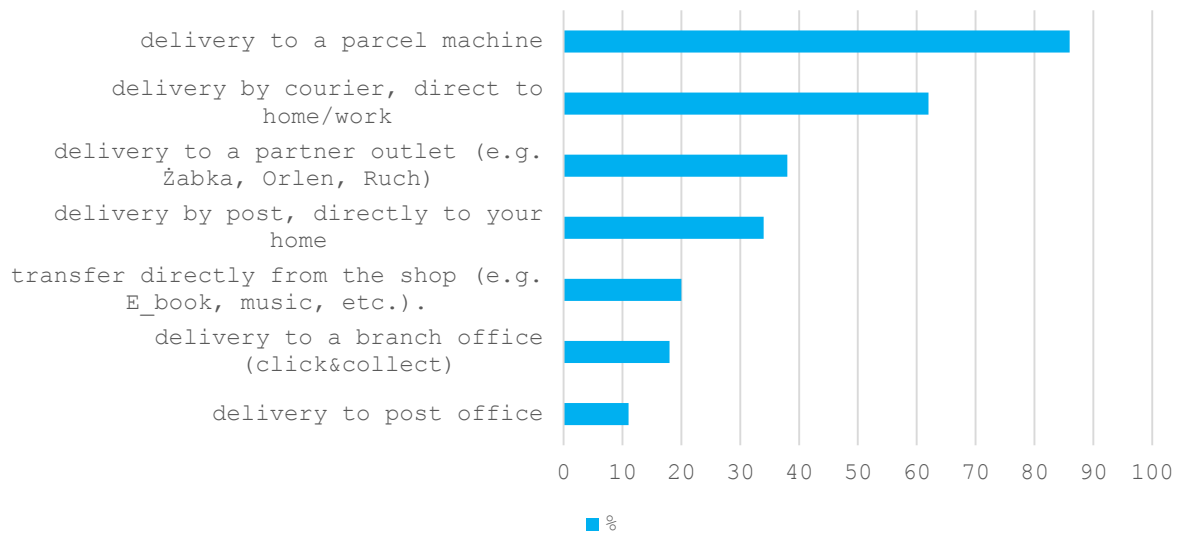
Figure 3. Distribution of respondents' answers to the question on the most preferred form of delivery when shopping online.

Source: E-commerce in 2024 Trends, Opportunities and Threats (2024). The text comes from: https://harbingers.io/blog/e-commerce-w-2024-roku-trendy-szanse-i-zagrozenia

Parcel lockers and pick-up points are an integral part of the modern urban logistics landscape. These innovative solutions have enabled customers to pick up their orders flexibly. Instead of the parcel being delivered directly to the customer's home, the order can be picked up at a time and place convenient for the customer, minimising the problem of failed delivery attempts. Parcel machines in Poland are exceptionally popular, with as many as 99% of participants in a survey conducted by Colliers in 2023 using them. According to forecasts, this market will continue to grow rapidly, reaching a stock of 45,000 machines in 2024. According to the authors of the report: 'Parcel Machines 2.0: Development, innovation, future' (Chmielewski et al., 2024), there were 38,000 parcel machines in Poland in 2023. The leading company in terms of the number of machines in Poland as of 2021 is InPost. The authors of the report state that Poles most often order clothes, shoes and books to parcel machines. They point out that 65% of all machines are located in urban municipalities and only 17% in rural municipalities.

The use of electric cars, cargo bikes or autonomous delivery vehicles and drones is cited as an example of the realisation of green e-commerce in urban areas (realisation of the last stretch of distribution - last mile logistics). This is primarily in response to the need to reduce CO_2 emissions and regulations on car traffic restrictions in city centres. In Europe, there are a number of projects aimed at implementing, for example, cargo bikes in the operation of city logistics. One example of the implementation of a 'cargo bike' in city logistics is the city of Slupsk and a project called CoBiUM - Cargo Bikes in Urban Mobility, funded by the European Union. Companies using the advantages of cargo bikes in Europe are: Bubble Post from Belgium (Ghent), Hajtas Pajtas from Hungary (Budapest) or Ordr from the Czech Republic (Prague) (Starczewski, 2022). Autonomous technologies, such as autonomous delivery vehicles

and drones, are innovative solutions that could revolutionise urban logistics. Their implementation will enable unmanned deliveries, which can reduce operational costs and increase efficiency. An example of the testing of this technology in the US is Nuro, which has received approval to begin testing R3 autonomous delivery vehicles in four Bay Area cities (Korneluk, 2024). Amazon Prime Air, on the other hand, is developing the delivery of parcels to end customers using delivery drones. Their aim is to speed up deliveries to hard-to-reach areas (e.g. congested cities) (Fedoruk, 2023). Real-Time Delivery Management is another facility that allows logistics companies to track vehicles and shipments and optimise delivery routes based on current road conditions and traffic forecasts. Thanks to this technology, it has become possible to inform customers about the status of their order. UPS has implemented 'ORION' (On-Road Integrated Optimisation and Navigation), which uses real-time data to optimise delivery routes (UPS enhances ORION with delivery route optimisation, 2020). Another trend in urban logistics that is also being implemented within e-commerce is crowdshipping platforms (Szymanowska, 2016). Deliveries within these platforms are based on collaboration with local couriers, who can be regular delivery people in exchange for remuneration. These types of solutions allow for fast delivery in congested urban areas, where traditional logistics companies may struggle to arrive on time. Stuart, a company operating in Europe, offers a crowdshipping platform that allows e-commerce companies to use a network of local couriers. This solution works well for express deliveries in congested cities where traditional logistics companies have limited availability (Logistics for a sustainable world: consistent, efficient and reliable, 2023).

Discussion

The article is mainly based on literature analysis, case studies and data from industry reports, which is a certain limitation in terms of the representativeness of the results. The data on the development of e-commerce and the impact of new technologies are for the period 2020-2023. However, it should be stressed that these data are derived from available industry reports, which do not always capture all aspects of local markets and specific urban contexts. There is a lack of data from quantitative methods (interview questionnaire, surveys). These data could deepen the understanding of urban logistics needs and challenges from different perspectives. This is important especially in relation to 'last mile logistics', which is sometimes implemented differently depending on urban structure, regulations and consumer expectations in different regions. However, in the author's opinion, the data in the article can provide valuable insights into the technology (automation, robotisation, crowdsourcing delivery model and personalisation) inherent in e-commerce logistics services, especially in the context of city logistics. The article concludes that modern technology contributes to delivery efficiency

to meet growing consumer demands for fast and environmentally friendly delivery. A new finding is the identification of the importance of 'green logistics' and sustainable transport in delivery in urban spaces, which can drive future research on urban infrastructure adaptation. In the author's view, traditional approaches to logistics service need to be modified and adapted to the challenges of modern cities. The data from the article can be used to optimise logistics processes, improve the quality of life in cities and implement environmentally friendly solutions, which is important not only for logistics but also for urban planning and sustainable development. The conclusions drawn from the article show that e-commerce is a catalyst for the development of urban logistics, which has theoretical implications for logistics and urban planning researchers.

Summary

Observation of the e-commerce environment, analysis and synthesis of the collected information of the impact of technology on e-commerce customer service indicate a continuous process of improving and increasing the level of automation of digital marketing activities in the e-commerce industry. This includes advanced e-commerce platforms, as well as customer relationship management (CRM) systems and analytical and marketing tools. Technology is an essential element of any online business (chatbots and voice assistants are an everyday reality in e-commerce).

Providing the highest possible level of customer service in e-commerce is also a challenge and one that is constantly changing in urban logistics, especially in the 'last mile' section. Today's consumers expect ever faster, more flexible and convenient forms of delivery, which challenges e-commerce companies to adapt city logistics to these growing demands (parcel machines, e.g. InPost). Real-time fleet management, allows customers to track their orders, reinforcing their sense of control over the entire shopping process and increasing their level of trust in online retailers. In the future, technologies such as autonomous vehicles and delivery drones, being tested by e-commerce market leaders, will play an increasingly important role in meeting the expectations of end consumers. However, it is important to remember that these innovations come with challenges. Examples include the personalisation of services, the expectation of fast and low-cost delivery while taking care of the environment, the handling of returns. The development of city logistics integrated with new technologies is not only a question of optimising delivery processes, but above all of improving customer service. In the world of e-commerce, where customer loyalty increasingly depends on the quality and speed of delivery, companies need to bet on innovative solutions that not only meet growing expectations, but also build lasting relationships with customers. The future of customer service in e-commerce will therefore depend on the ability of companies to combine technological

efficiency with a personalised approach to each customer's needs. The introduction of modern solutions, such as intelligent traffic management systems, the designation of dedicated delivery zones and the creation of micro-warehouses in city centres, is becoming necessary to keep traffic flowing and reduce the environmental impact of transport. At the same time, increasingly stringent environmental and regulatory constraints are forcing companies to invest in sustainable solutions such as electric vehicle fleets, cargo bikes and pedestrian deliveries. Many cities are introducing low-emission zones and restricting the entry of internal combustion vehicles into city centres, requiring companies to adapt their logistics operations to the new requirements.

These regulations, although initially costly, are helping to improve air quality and the overall quality of life in cities, while providing an opportunity for innovation and the development of more sustainable business models.

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