

Article

The Factors Influencing User Satisfaction in Last-Mile Delivery: The Structural Equation Modeling Approach

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Abstract: The primary goal of this research is to identify which factors most significantly influence customer satisfaction in the last-mile delivery (LMD) process. The sample comprised 907 participants (63.4% female) with a mean age of 34.90. All participants completed three questionnaires regarding LMD, customer satisfaction, and trust in courier service. Furthermore, participants answered questions related to significant aspects of the delivery process: speed, price, and courier call before delivery. To determine which factors most significantly influence customer satisfaction in LMD, structural equation modeling (SEM) was applied. The tested SEM model showed a good fit. The results indicated that within the LMD dimension, visual appeal was a significant predictor in a negative direction, and all other LMD dimensions (except parcel tracking) were positive and significant predictors of customer satisfaction. Trust in courier service, delivery price, speed, and courier call before delivery were statistically significant predictors of customer satisfaction in last-mile delivery, all in a positive direction.

Keywords: last-mile delivery; home delivery; customer satisfaction; customer experience; logistics; e-commerce

MSC: 62H12; 62H15; 62H20; 62H25



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1. Introduction

In today's digital age, electronic commerce is experiencing continuous growth and becoming an omnipresent part of our everyday lives. Since the Internet has become an accessible and secure channel for shopping, an increasing number of people are turning to e-commerce to satisfy their needs for various products and services. This rapid expansion of e-commerce has deep roots in several factors that have influenced its development [1,2]. The rapid development of the Internet and 5G networks has significantly facilitated the strong development of new e-commerce models [3,4]. For example, Web 2.0 has led to the emergence and development of a platform-based e-commerce model [5]. Technological advancement has enabled widespread internet accessibility, allowing people from around the world to access e-commerce and engage in online shopping. Moreover, digital technologies such as artificial intelligence (AI), cloud computing, and big data fueled the development of e-commerce [6]. E-commerce has been driven by the rapid advancement of these technologies shaping the body of research in this field [6].

Furthermore, the ubiquity of smartphones and other mobile devices enables users to access e-commerce anytime and anywhere [7], further stimulating the growth of this industry.

Recently, the COVID-19 pandemic has also contributed to the development of e-commerce, which was evident in the years following the pandemic when many customers began to shop online, leaving behind the traditional way of shopping [3,8–11].

The number of online shoppers increases every year, and consumers are increasingly using the internet to purchase both smaller and larger products [12]. This significant growth in e-commerce has resulted in various challenges, including expensive business operations and high logistical expenses for product delivery. Consequently, supply chains have undergone restructuring, and e-retailers, alongside parcel delivery companies (logistics providers), have embraced a variety of delivery strategies. Academic research in this field has also experienced an increase due to the growing popularity of online shopping [12–16].

Norell and Student [17] underscore a notable transformation in the function of logistics service providers precipitated by the advent of e-commerce. Preceding the rise of e-commerce, logistics operated inconspicuously in the background, largely overlooked by end consumers. Its principal objective was to furnish stores and warehouses with merchandise, with consumers conducting transactions primarily in physical establishments. Customers now possess the autonomy to choose among various logistics providers for the delivery of products acquired through the websites from which they make their purchases [17,18].

This has led to a necessity for logistics providers to tailor their services to meet the demands and expectations of individual consumers. Customers have become active participants in the logistics process, selecting delivery models that suit their preferences [19]. The shift in the role of consumers [20] has given rise to the term “logsumers” (logistics consumers), indicating their increasing power and influence on the entire supply chain. Consequently, logistics is no longer concealed from consumers, as it was before the development of e-commerce; instead, it has become an exceptionally crucial factor in their online experience, influencing their purchasing decisions [17,21–23].

The term “last-mile” originated from the telecommunications industry, originally denoting the final segment of the network [24].

Transporting products from the distribution center to the final delivery point, in the context of e-commerce, represents the “last mile” of the logistical process [25–30]. The “last mile” represents a pivotal element of the supply chain, particularly in the e-commerce and retail sectors, where users’ demand for swift parcel delivery significantly escalates due to the surge in online shopping [27]. The accelerated development of last-mile delivery (LMD) is attributed to intense urbanization and population growth [31], the expansion of e-commerce [5,13], shifts in consumer behavior [32,33], as well as innovation and the introduction of new technologies [34].

The user experience in the LMD process encompasses various aspects that can influence customer satisfaction. Customer satisfaction is the key goal of every e-retailer because satisfied customers are more likely to return for repeat purchases and recommend products and services to others [35]. Therefore, it is essential to identify the factors contributing to customer satisfaction in the LMD process. The role of customer satisfaction in product delivery is crucial in today’s business environment, especially in the logistics sector [36]. Otsetova [37] emphasizes that courier service providers need to be proactive in improving service quality to meet the needs of their customers. In the face of increasing competition in the logistics sector, understanding customers’ needs and expectations becomes crucial for business success. Customer satisfaction analysis enables logistics company management to identify key factors influencing customer satisfaction, allowing them to discover potential avenues for increasing satisfaction levels and creating a competitive advantage [36].

E-retailers invest efforts in aligning logistics operations with customer needs to achieve a high level of customer satisfaction. Effective logistics management can result in reduced delivery costs, increased productivity, and enhanced customer satisfaction. Therefore, it is important to explore the factors that influence the increase in customer satisfaction levels in product delivery and how delivery processes can be improved and tailored to maximize customer satisfaction in e-commerce.

Previous research focusing on e-commerce users has primarily concentrated on the online shopping experience and customer satisfaction. Some authors proved that saved time, shopping variety, and shopping-related risks have a significant relationship with customers’ satisfaction [38]. Furthermore, some authors applied structural equation model-

ing (SEM) to evaluate the level of customer satisfaction, trust, and service quality of the e-commerce application, concluding that a significant correlation exists between customer satisfaction and service quality, whereas customers' trust is significantly impacted by their level of satisfaction and perception of security [39]. Another study that examined customer satisfaction while online shopping in Italy concluded that delivery time is the most important factor for customer satisfaction [40]. Additionally, a study conducted to evaluate the impact of online shopping attributes on customer satisfaction and loyalty concluded that the customer satisfaction of online shoppers is influenced by product delivery, perceived security, information quality, and product variety, whereas customer satisfaction and information quality determine customers' loyalty towards web stores [41].

The presented previous research focused on the complete online shopping experience, while the user experience during the final phase of online shopping, namely the LMD stage, has rarely been included or observed separately in models measuring customer experience and satisfaction in e-commerce [42]. Some authors did investigate consumers' preferences for last-mile delivery alternatives regarding delivery options and challenges. However, the authors have not statistically proven which factors influence customer satisfaction in the last-mile delivery process [43].

Most of the work published on the last-mile delivery processes is focused on exploring logistics systems [44–46], information technology application [47–49] and cost efficiency [50,51].

This research gap has created an opportunity to explore the components of user experience in LMD and the factors that influence customer satisfaction. Some authors [42,52,53] have highlighted the importance of researching the final phase of online shopping, the product delivery stage, and pointed out the lack of inclusion of this component in models of customer satisfaction in e-commerce. The motivation behind this research is to fill the gap in the literature by incorporating aspects of user experience in LMD, product delivery aspects, and trust in courier services into the model of customer satisfaction in e-commerce.

Therefore, the subject of this research is the LMD process, focusing on the factors that influence user experience and satisfaction in e-commerce. Understanding these factors is vital for e-retailers and logistics providers to improve their operations and provide customers with an optimal experience.

In this context, the aim of this research is to identify the key factors that have the most significant impact on customer satisfaction during the product delivery process in order to develop guidelines and recommendations that will help companies improve their product delivery processes, enhance customer experience and satisfaction in the context of online shopping, and gain a competitive advantage in the growing e-commerce market. Using SEM to analyze data obtained from 907 participants, the results indicate that factors such as convenience, joyful anticipation, pickup and courier contact, delivery efficiency, trust in courier services, delivery price, and speed contribute significantly to customer satisfaction in the last-mile delivery process.

The first part of the paper involves reviewing the relevant literature to gain insight into previous research and theoretical perspectives on this topic. The second part of the study is dedicated to describing the research methodology, including the sample, measurement tools, and analytical approaches. Finally, the discussion and conclusions drawn from the analysis of the study's results are presented, along with implications for future research and practice in the field of product delivery.

2. Literature Review

This section presents the critical aspects of user experience and customer satisfaction in LMD, from the moment the product leaves storage to the moment the product is delivered. Emphasis is placed on delivery components, encompassing considerations such as delivery cost, speed, and the trustworthiness of courier services, all of which shape users' perceptions regarding service quality. These aspects hold an important role in comprehending consumer behavior, attaining customer satisfaction in the LMD process, and fostering enduring relationships with service providers within the online environment.

2.1. Aspects of User Experience in LMD

2.1.1. Delivery Efficiency

The rapid growth of online shopping in recent years has underscored the importance of home delivery services provided by parcel delivery personnel in enhancing customer satisfaction [32,54]. Home delivery services present an opportunity for tailored, convenient, and efficient product delivery, which can be leveraged to build long-term customer relationships, gain competitive advantages, and increase customer satisfaction. Timely delivery, improved service quality, the generation of positive perceived value for users, and trust in service providers (logistics providers) are factors contributing to customer satisfaction [55]. Zhou et al. [56] emphasize that LMD constitutes the largest portion of time and costs among all logistics operations and has become the most critical issue affecting the efficiency of logistics services; inefficiencies in product delivery subsequently impact customer satisfaction.

Efficient logistics play a crucial role in providing customer satisfaction and creating a competitive advantage for e-retailers [57]. Efficient distribution of delivery needs to be developed in a manner that offers an advantage over the competition. In other words, efficient logistics services profoundly impact the profitability of an organization, customer satisfaction, and the positive image of the company itself [58]. Accuracy during deliveries is consistently highlighted as one of the most important factors in logistics performance, which also determines consumer satisfaction, with delays often resulting in re-deliveries, lower perceived quality, higher costs, and customer dissatisfaction. Any inefficiency in logistics services during the delivery process also affects e-retailers in terms of negative customer perception [59].

The efficiency of logistics in the LMD process plays a crucial role in shaping customer evaluations post-purchase, which impacts the image of both logistics service providers and e-retailers. In e-commerce, product production and consumption are separate, necessitating products to be delivered to consumers before consumption, but often, product delivery is not efficient [60]. Delays in product delivery can lead to customer dissatisfaction and negatively impact their online shopping experience [60]. Efficient delivery (timely and reliable) will meet customer expectations, leading to customer satisfaction, and encouraging repeat purchases from the same online retailer [61]. Additionally, Meidutė and colleagues [62] emphasize that delivery efficiency directly affects customer satisfaction.

Wolfinbarger and Gil [63] highlight that providing delivery services by online sellers is the most critical factor for assessing the level of customer satisfaction compared to other aspects of online store quality. Timely receipt of the correct product, in accordance with the promised product distribution conditions by the online seller, positively influences customer satisfaction. Research conducted in the context of online shopping [60,64–68] unequivocally indicates that the reliability (efficiency) of delivery has a positive impact on customer satisfaction.

2.1.2. Parcel Tracking

Logistics service providers are confronted with formidable challenges in the realm of LMD, encompassing elevated expenses associated with order fulfillment, intensified competitive dynamics urging the provision of complimentary delivery services, and escalating consumer demands for expeditious delivery coupled with real-time shipment tracking capabilities [69,70]. The implementation of shipment tracking mechanisms for online orders serves as a pivotal tool for customers, affording them the capability to monitor the progress of their orders closely, pinpointing precise delivery times and locations. Typically disseminated through channels such as email, SMS notifications, dedicated website portals, or specialized mobile applications, the provision of accurate and personalized order status updates serves to augment customer confidence levels and foster repeat patronage from the same retailer [57,70–72].

With the proliferation of the internet and e-commerce, transparency has emerged as a paramount consideration. Customers now expect comprehensive insights into the

status of their shipments, spanning from the moment of ordering to the point of product delivery [73,74]. In their research, Kawa and colleagues [57] assert that information flow is a pivotal determinant of customer satisfaction in e-commerce. Timely and accurate updates regarding product availability, delivery or pickup times, and locations hold significant importance for customers. According to their findings, shipment tracking exerts the most substantial influence on customer satisfaction.

Inquiries regarding the requirements and preferences of online consumers encompass a desire for enhanced control over delivery processes, a more comprehensive comprehension of delivery methodologies, and the capability to monitor shipment statuses using contemporary technologies [75]. Shipment tracking holds particular significance for online consumers owing to their inability to physically inspect products before purchase. Consequently, in such circumstances, purchasing is perceived as a risky endeavor, underscoring the critical importance of shipment tracking in assuaging feelings of uncertainty and influencing repeat purchase intentions [76–79]. Presently, a majority of logistics providers and courier services offer comprehensive shipment tracking capabilities, including regular updates via email, SMS, or text messages throughout the entirety of the delivery process. Furthermore, consumers often express a desire to modify delivery locations and times while goods are still in transit. Numerous scholarly studies [79–82] have identified factors such as reliability, delivery information provision, and order tracking as influential precursors to customer satisfaction and loyalty in the domain of e-commerce.

2.1.3. Visual Appeal

Previous research has affirmed that consumers anticipate aesthetically pleasing design within service environments, and they exhibit a predisposition toward heightened satisfaction when the spatial design is aesthetically pleasing compared to instances where this is not the case [83]. Olsson et al. [53] assert that the sensory dimension of user experience, pertaining to users' senses, is important in managing the overall experience. They put focus on sensory experience within contactless product delivery, focusing on the design and size of the reception box, and conclude that users positively appraised a modern and attractive box design.

Given the growing popularity of online shopping, the phenomenon of impulse buying among consumers has become more researched. In this environment of intense competition among online retailers, e-commerce businesses should carefully consider the factors influencing consumers during the online shopping process [84]. One of the factors is the visual appeal that online stores employ to attract and engage consumers and influence their emotions [85].

Tractinsky and Lowengart [86] present a different perspective, suggesting that consumers who are more sensitive to aesthetics are likely to value aesthetic aspects more compared to less sensitive consumers. It is noticeable that there is a lack of research on the impact of visual aspects during product delivery in the context of online shopping. Previous studies do not provide insights into the influence of visual aspects in the product delivery sector (such as the appearance of delivery vehicles, visual aspects during delivery, and the appearance of delivery personnel) on increasing customer satisfaction in the LMD. This gap in the literature motivated the authors to include this dimension of customer experience in the tested model.

2.1.4. Positive Emotions—Joyful Anticipation

Plutchik's psychoevolutionary theory [87] of emotions identifies eight basic emotions: acceptance, disgust, fear, anger, joy, sadness, anticipation, and surprise. These emotions are formed as adaptive responses to various stimuli. The theory has been applied in research on consumption, shopping experiences, responses to advertisements, and other marketing phenomena, including the online environment [88]. However, studies focusing on the online environment have only addressed parts of Plutchik's emotions, such as joy and anger [89,90].

Research on emotions in marketing has gone through three phases: the category approach, the dimensional approach, and the cognitive appraisal approach. The cognitive appraisal approach is considered the most relevant for understanding consumer emotional responses. However, before a comprehensive theory of cognitive appraisals can be developed, consensus on the characteristics of emotion-evoking situations and their impact on consumer behavior needs to be achieved [88].

Some authors [91] have investigated online shopping experiences from different motives. They define primary experience (sensory, affective, intellectual, behavioral, relational) and procedural experience (convenience of decision-making, access, and benefits) as factors influencing the attractiveness of online shopping. The goal is to understand how the shopping experience affects consumer behavior and the attractiveness of e-retailers.

Flow, known in the literature as a state of “pleasant experience,” is a psychological state experienced when a person is fully engaged in activities or tasks [89]. In the context of the online environment, flow plays a significant role in enhancing user satisfaction and can be crucial for understanding consumer behavior on the internet [92]. Enjoyment of online shopping influences user satisfaction [93]. When consumers are in a state of flow, they experience happiness, self-confidence, and a desire for exploration [94].

It is emphasized that positive emotions, such as joy and excitement, have a greater impact on customers in creating a positive online shopping experience, inducing a state of flow [95]. This research underscores the crucial role of emotions in shaping consumer attitudes and decisions in the online environment, with a particular emphasis on joy as the most significant positive factor influencing the occurrence of flow [95].

Enjoyment in shopping results from various emotional and multisensory elements and plays a role in forming satisfaction, trust, commitment, and loyalty to the brand or retailer. Emotional experiences and sensory stimulation in shopping shape positive feelings toward the brand and build long-term relationships with consumers [96].

In the context of the LMD and positive emotions, joyful anticipation is the emotion that should be observed. Joyful anticipation can be measured through the emotions of looking forward to the delivery, awaiting the delivery of the ordered items, and happiness when the shipment is received [72].

In conclusion, research on emotions is significant for understanding consumer behavior in the online environment. This study examines the occurrence of the emotion “joyful anticipation” during the waiting phase for the ordered product purchased online, with the assumption that the emotion of joyful anticipation will positively influence customer satisfaction.

2.1.5. Pickup and Courier Contact

Olsson et al. [53] highlight the significance of human interactions during the product delivery process. The lack of social interaction, typical for contactless delivery, may be noticeable compared to traditional shopping models where social interaction is an advantage. Their results emphasize the importance of the delivery personnel’s role in contact delivery in creating a positive user experience. It is apparent that human aspects play a vital role in shaping user satisfaction during the product delivery process [54,62], indicating the potential for enhancing the delivery interaction process to further improve overall user experience and satisfaction. This is because throughout the entire online shopping journey, from ordering to delivery, courier companies or delivery personnel are the only ones with direct contact with customers [97].

When the delivery process, or rather, the product handover process, meets customer expectations, we obtain a positive user experience that influences customer loyalty and satisfaction [62,98]. When customers perceive the delivery service from delivery personnel as better than expected, they are satisfied. This positive experience increases the likelihood that customers will remain loyal to the company. It is important to create positive perceptions of value for customers by providing a service that meets or exceeds their expectations [55].

Uzir et al. [55] emphasize that the quality of delivery staff service is becoming a key characteristic of customer satisfaction. Customers expect accuracy, reliability, and timeliness in delivery, and the behavior, attire, communication, and care of staff play a crucial role in customers' perception of the company. Delivery staff should be attentive and patient and provide assistance, especially for expensive items. In case of issues, empathy, problem-solving, and calming customers are crucial. This research confirms that the quality of delivery service significantly impacts customer satisfaction and brand perception, contributing to building loyalty to the company [55].

2.1.6. Convenience of Delivery

Time scarcity is becoming an increasingly significant issue for consumers, significantly impacting their shopping habits [99]. Consumers are turning to time-saving strategies such as one-stop shopping to cope with this challenge. Time scarcity, among other factors, can significantly contribute to the rise of online shopping [99]. When consumers have limited free time due to commitments and work pace, online shopping becomes an attractive option due to its convenience.

Convenience is cited in the literature as one of the primary motives prompting consumers to opt for online shopping over traditional methods [99–102]. Shopping requires time and effort on the part of consumers as it involves performing multiple tasks, and given that today's consumers are very busy, it is essential to consider the advantages that online shopping offers in terms of convenience [35]. One of the main benefits of e-commerce is convenience [99–102]. The convenience of shopping anytime, anywhere, from anyone [7] facilitates product searches and reduces geographical and time constraints.

The convenience of online shopping is a concept that refers to the simplicity, ease, and usefulness of the online shopping process [35,99,103].

Jun et al. [104] highlight a positive relationship between online convenience and user satisfaction. This means that if a service is made more convenient, consumers will value it more, resulting in higher satisfaction [105]. Increasing the convenience of services provided online will result in increased customer satisfaction [106]. According to [92], when consumers can use services in a simple and enjoyable way with minimal effort, it increases the likelihood of their satisfaction and their willingness to reuse those services. In their research, Duarte and colleagues [35] emphasized that convenience plays a role in customer satisfaction, recommendations to other customers, and intentions for future purchases. They found a strong correlation between customer satisfaction and willingness to repurchase and recommend online services. The results of their study indicate a positive relationship between the perceived convenience of online shopping and customer satisfaction.

However, the presented research on online shopping convenience was focused on the overall shopping experience. Berry et al. [107] point out the lack of research on delivery service convenience, emphasizing that most research on convenience orientation focuses on the intention for repeat purchases. Service convenience refers to consumers' perception of the time and effort required to use the service and is important because consumers often evaluate services based on how much they save their time and effort. The authors emphasize the need for further research to better understand the role of convenience in service delivery and to create a more comprehensive understanding of how consumers react to convenience regarding services.

In line with the above, this research will attempt to determine users' perceptions of the convenience of home delivery compared to going to a traditional store and its impact on user satisfaction with the delivery process.

Based on the literature review covering delivery efficiency, convenience, visual aspects, positive emotions, shipment tracking, and recipient interaction with the courier, we can see that many authors emphasize the importance of these aspects in shaping the user experience during the LMD process as well as their significant impact on user satisfaction. Therefore, the authors set the following hypothesis:

H1: *User experience aspects in LMD have a positive impact on user satisfaction in the process of product delivery.*

2.2. Product Delivery Aspects

2.2.1. Delivery Price

The delivery cost is often highlighted as a factor influencing customer satisfaction in e-commerce. Research by Rao and colleagues [79] reveals a strong correlation between the quality of logistics service, delivery price, and customer satisfaction. When the delivery fee is not included in the product price but is charged separately, it can negatively impact customer satisfaction. Therefore, it is important for e-retailers to offer affordable delivery prices to ensure customer satisfaction and loyalty [79].

Some authors, such as Lahiri et al. and Luo et al. [108,109], conclude that delivery costs and service quality are crucial factors in customers' decisions when choosing a logistics provider for product delivery. Additionally, Meidutė-Kavaliauskienė et al. [62] conclude that when choosing between potential logistics service providers, customers assess not only service quality but also delivery costs.

Bolton and Lemon [110] investigate how price satisfaction affects overall satisfaction and analyze a dynamic model that includes the relationship between payment, customer satisfaction, and service usage in online stores. The results show that customers evaluate their satisfaction relative to payment equivalence, expectations, and service, with satisfaction influencing future service usage. Cao et al. [77] state that according to Jupiter Media Metrix data, 63% of online shoppers consider high delivery costs a deterrent to online shopping. Lewis [111] highlights that the growth of the e-commerce sector underscores the importance of delivery costs and concludes that these costs significantly impact the ordering rate, i.e., the number of new customers, as well as the retention of existing customers. This means that high delivery costs can deter customers from repeat purchases, while lower delivery costs can contribute to retaining existing customers.

Recently, free shipping for orders above a certain monetary value has become a very attractive factor for online shoppers [69]. Research shows that most consumers prefer free shipping over lower delivery charges or free returns. This has become a key marketing strategy used by online retailers to attract and retain customers. Studies have shown that free shipping can significantly increase the number of orders and attract new customers [112]. Based on the results of other studies [113,114], it can be concluded that customers prefer free shipping. The majority of customers, 70%, prefer the cheapest home delivery option. A total of 23% are willing to pay more for same-day delivery. A smaller percentage, namely 5%, would be willing to pay more for reliable delivery within a specific time frame, while only 2% would pay more for instant delivery [113]. Lukic et al. [114] surveyed 1500 customers in the United States about what would encourage them to engage in more online shopping.

They conclude that for the majority of consumers, as much as 74%, free product delivery is the most important factor, followed by product price and the option for product returns.

2.2.2. Delivery Speed

Delivery performance describes "how well a product reaches the customer, including the speed, accuracy, and attention during the delivery process to the final destination" [115]. Customers tend to prefer fast delivery of online purchases because they expect online shopping to provide a more efficient and convenient option compared to visiting a physical store. Therefore, timely and reliable delivery impacts customer satisfaction and retention of loyalty towards the same online store in the future [61]. Moreover, regarding customer satisfaction in e-commerce delivery processes, the distribution of packages to the actual customer requires fast transportation with shorter delivery times to meet customer expectations regarding delivery speed, thereby gaining customer trust in companies involved in the LMD process, as confirmed by Mangiaracina et al. [116] when they note that e-customers

are highly demanding in terms of delivery accuracy and speed. Merkert et al. [117] also conclude that customers value delivery speed and accuracy. Other authors [116–120] also emphasized that the logistics context and fast and reliable delivery influence customer satisfaction. Customers expect convenience and do not want to deal with delivery issues (e.g., delivery delays, wrong products, or lost packages) [117]. Delivery should, therefore, be as fast as possible—preferably within the next working day or even the same day [57]. Additionally, Shrinivas Brahme and Shafighi [59] highlight that delivery time is one of the most important issues. According to these authors, maintaining the period between purchase and delivery to be as short as possible is one of the most important aspects determining customer satisfaction in e-commerce.

In the context of logistics and e-commerce, the capabilities contributing to customer satisfaction include fast and reliable delivery, flexibility in adapting to customer requirements, and a quick response to their needs. When companies successfully apply these capabilities, they gain a competitive advantage and build a positive image, which positively affects overall customer satisfaction [119]. Joerss [113] states that sellers strive to provide the best possible experience for consumers, particularly by emphasizing delivery speed or improving delivery times. The results of the research they conducted in three countries indicate that there is a certain percentage of consumers (25%) who are willing to pay more for fast, same-day delivery of products, but only 2% of them are willing to pay significantly more. They mention that consumers are more willing to pay more for fast delivery when it comes to ordering food products, for example, than for clothing. It can be concluded that the type of goods purchased online also influences the importance of delivery speed [121], where Fisher et al., through an analysis of different customer segments, note that new customers show greater sensitivity to delivery speed compared to customers with longer experience in online shopping. They also state that among existing customers, reactions to delivery speed vary—occasional buyers are more sensitive, while frequent buyers show significantly less reaction to changes in delivery speed. Their results suggest that delivery speed can significantly influence the perception and evaluation of the online shopping experience but that customer reactions also depend on their previous experiences and the frequency of their purchases.

Based on the above, it can be concluded that certain aspects of delivery, such as delivery cost, delivery speed, and pre-delivery contact with the delivery person (further detailed in Section 2.1.5), impact customer satisfaction in the delivery of products.

2.2.3. Courier Call

Most authors in the literature [27,42,55,80,122] highlight the importance of communication with the customer, flexibility in terms of changing delivery times and addresses, as well as the importance of customers being informed. Logistics providers or delivery personnel bear the greatest responsibility for the aforementioned. Li et al. [123] state that product delivery is a significant logistical process because it directly interacts with customers and influences their satisfaction. In the entire logistical process (packaging, loading, unloading, transportation), product delivery is the only process that involves contact with customers, and they note that the attitude and behavior of delivery personnel directly affect satisfaction. Courier call is an important part of the communication with the customer that happens before the actual courier contact.

Therefore, the authors set the following hypothesis:

H2: *Aspects of product delivery have a positive impact on customer satisfaction in the process of product delivery.*

2.3. Trust in Courier Services

Trust in a brand can be a key element in an online environment, given the high unpredictability of consumer behavior [124]. According to Gefen and Straub [125], brand trust reflects consumers' belief that the brand's services will meet their expectations and

emphasizes the crucial role of trust in e-commerce. They highlight that trust is important in the online environment due to the lack of clear rules and customs, as well as the limited ability to verify products and services. A high level of trust encourages the intention to shop online and contributes to customer retention, while a lack of trust can deter people from shopping online. The industry also recognizes that successful e-commerce depends on building strong trust relationships with customers, while a lack of trust can contribute to failures in online business [125]. According to one study [126], key characteristics of trust include honesty, reliability, promise fulfillment, competence, service quality, credibility, and benevolence.

In the context of the service sector, trust is defined as the level of reliability that the service provider guarantees to the recipient, with the aim of maintaining and developing a positive relationship between them. Trust in the service provider allows for the evaluation of the service or provider before using the service [127,128]. The type of services provided and the nature of the relationship (direct or indirect) between the service provider and the user determine the process of building trust-based relationships. In the case of direct customer contact with the service provider (financial insurance and advisory services), human and social factors play a more significant role in the trust-building process. On the other hand, in cases where the service is provided in the form of e-services (e-commerce), physical and technological factors gain importance [97].

The existing literature [129–133] on courier companies has mainly focused on evaluating the quality of service provided. These works have explored various aspects of service quality, such as delivery speed, order accuracy, quality of information, communication with clients, responsibility, and commitment to problem-solving. By studying these factors, researchers have attempted to understand how these factors affect customer satisfaction and the overall quality of courier service delivery. Although these studies were useful for creating a basic understanding of what constitutes quality courier service, there are gaps in the literature. For example, there is a lack of a clearly defined set of criteria for evaluating service quality, as well as a lack of a generally used scale for measuring quality. Additionally, little attention has been paid to adapting these studies to the changing demands of customers and the available resources of courier operators. These gaps in the literature indicate the need for further research to better understand the relationship between service quality and customer trust in courier companies [134].

Gulz [134] believes that courier companies, in order to remain competitive in the market, must focus on improving the quality of their services as a key strategic goal. Therefore, the topic of measuring service quality in the courier industry is of paramount importance, both for practitioners and researchers [134]. Service quality and trust are a two-way relationship. Service quality and trust are interconnected—better-perceived service quality often results in greater customer trust. In order for service providers to increase customer trust, it is important to reduce the perception of uncertainty and risk during service provision [97].

Kania [124] highlights in his work that it is important how courier companies respond to consumer complaints on social media because it affects how potential customers perceive them. Quick and efficient responses to complaints can improve consumer trust in these companies and make them more loyal. It is also emphasized that companies need to understand and apply principles of fairness and responsibility to build consumer trust and loyalty. These findings can be useful for understanding how trust in courier services is formed and for developing strategies that will make them reliable and preferred choices among consumers. Existing research also shows that literature on continued service use in online environments and the financial industry has emphasized the role of trust [8,135,136]. When consumers trust service providers, interaction between them is encouraged. When they perceive the service provider as reliable and trustworthy, the relationship between them continues to develop [137].

Trust is crucial in creating satisfied and loyal customers in e-commerce and promoting long-term relationships. Customers perceive online sellers as riskier compared to traditional

sellers but are willing to buy from those they trust. Trust is crucial for customers in the process of transitioning from feelings to convictions and varies for each individual [138].

Long-term loyalty and customer feedback represent key factors for product delivery services. The challenges faced by logistics companies in building reliable relationships with customers require a lengthy process but are simultaneously crucial for modern organizations, especially those providing services [72,97]. The study conducted by Ejodus and Gulz [97] focused on courier services and aimed to address shortcomings in the existing research body. The emphasis was on examining the relationships between five key constructs: the usefulness of courier services, ease of use of courier services, trust in courier services, service quality, and future intentions to use courier services. This study was precisely the motivation to include the trust in courier services scale—an adapted version of their scale in Serbian—in the research and to test whether trust in courier services has a positive impact on customer satisfaction.

Courier service is the final and crucial step in the process of online shopping [97], and for this reason, the authors propose the third hypothesis:

H3: *Trust in courier services has a positive impact on customer satisfaction in the process of product delivery.*

3. Materials and Methods

3.1. Sample

The study involved a total of 907 participants, with a majority being female (63.2%, $N = 575$). The age of participants ranged from 20 to 76 years ($M = 34.90$, $SD = 12.69$). The largest proportion of participants had completed high school (43.5%, $N = 396$) or had attained undergraduate degrees (higher education; 27.6%, $N = 251$). Regarding employment status, the majority of participants were permanently employed by their employer (47.0%, $N = 428$) or were students or pupils not engaged in employment (19.2%, $N = 175$). In terms of residence, a significant majority lived in a city or municipality (75.3%, $N = 685$), while the largest income brackets among participants were between 100,000 and 200,000 RSD (29.3%, $N = 267$) and between 50,000 and 100,000 RSD (22.7%, $N = 207$), with a considerable number of participants opting not to disclose their monthly income (25.2%, $N = 229$). The sociodemographic characteristics of the participants are presented in Table 1.

Table 1. Sociodemographic characteristics of the sample.

Characteristic	Level	F	%
Gender	Male	324	35.72
	Female	575	63.40
	Other/do not wish to disclose	8	0.88
Education	Primary school	4	0.44
	High school	396	43.66
	College	91	10.03
	Undergraduate studies	251	27.67
	Master's or specialist studies	118	13.01
	Doctoral studies	34	3.75
	Student	13	1.43

Table 1. Cont.

Characteristic	Level	F	%
Employment status	Permanently employed with an employer	428	47.19
	Student or pupil who is not employed	175	19.29
	Self-employed (entrepreneur)	95	10.47
	Temporarily employed or working part-time	81	8.93
	Unemployed	64	7.06
	Student or pupil who is also employed	45	4.96
	Retiree, on disability, or old-age pension	11	1.21
	Other	8	0.88
Monthly income of the entire household	Up to 50,000 RSD	78	8.60
	Between 50,000 and 100,000 RSD	207	22.82
	Between 100,000 and 200,000 RSD	267	29.44
	More than 200,000 dinars	126	13.89
	Do not wish to respond	229	25.25
Place of residence	Town/township	685	75.52
	Suburban settlement	101	11.14
	Village	121	13.34

Note. F—frequency. %—percentage. The level of education refers to the highest level of education completed by the respondents, with tertiary education divided into completed undergraduate, master's/specialist, and doctoral studies.

3.2. Procedure

Data collection was conducted during November and December 2022, employing two distinct convenience sampling strategies for participant recruitment (detailed later in this section). All data were gathered through the Google Forms platform via an online survey distributed to participants. Participants included in this study were all adults residing in the Republic of Serbia who had at least one experience purchasing non-perishable goods online for delivery to a specific location (excluding online food orders). Prior to participating in the study, participants provided consent for their involvement, were assured data anonymity (they were informed that their individual responses would not be viewed separately from others), and were briefed on the study's objectives. They were also informed that they could withdraw from the study at any time and could contact the author's email address for debriefing after completing the survey. Completing the entire survey required about 35 min.

Regarding the different data collection and sampling strategies, the first strategy involved inviting participants through social media and other digital platforms. The second strategy focused on collecting data from acquaintances (personal contacts) of students across various departments, years, and levels of study at the Faculty of Technical Sciences in Novi Sad. Students were tasked with recruiting three participants each, for which they received 2 course credits. Given that students had two weeks to complete data collection and that the number of credits for this task was minimal, the risk of collecting inadequate or falsified data was considered extremely low. Both data collection strategies enabled a rapid data-gathering process with a greater representation of all relevant sample characteristics compared to the target sociodemographic features of the general population [139]. An additional advantage of the applied sampling strategy is its ability to combine the strengths of both convenient and purposive sampling methods. Compared to purposive sampling, each sampling strategy aimed to gather a group of respondents with specific sociodemographic characteristics, while the use of convenient sampling allowed for quick

and efficient sampling in both phases of the process. In other words, through the first data collection strategy via social media and media, a larger number of older participants, those in permanent employment with high monthly incomes (over 200,000 RSD), as well as participants living in rural or suburban areas with lower levels of education and generally less frequent online shopping habits, were recruited. Conversely, by employing the second strategy, i.e., collecting data through students' personal contacts, data from younger participants of various employment statuses and monthly incomes, living in cities, with lower education levels and generally more frequent online shopping habits, were collected.

3.3. Materials

Customer Satisfaction Scale (CSS). The CSS is a Serbian adaptation of the scale developed by Vakulenko et al. [42], designed to assess customer satisfaction related to their most recent online purchase. This scale consists of ten items, each rated on a five-point Likert scale ranging from 1 (very dissatisfied) to 5 (very satisfied), with each item addressing a different aspect of satisfaction during online shopping. The exact questionnaire is attached in Appendix A.

Trust in Courier Service Scale (TCS). This scale was developed specifically for this study, inspired by the work of Ejdys and Gulc [97], to evaluate the trust users place in courier services. It includes six items that represent different facets of courier service, allowing users to express varying degrees of trust. Responses are captured on a seven-point Likert scale (1 = does not apply to me at all, to 7 = applies to me to a great extent). The exact questionnaire is added in Appendix B.

Last-mile Delivery Questionnaire (LMD). This questionnaire covers twenty-four different indicators of the customer experience throughout their journey, grouped into six broader dimensions: convenience, joyful anticipation, visual appeal, pickup and courier contact, parcel tracking, and delivery efficiency. Responses were collected on a 5-point scale (1 = not relevant at all, to 5 = highly relevant). The process of constructing and validating the questionnaire is detailed in Vrhovac et al. [72]. The exact questionnaire is added in Appendix C.

Additionally, data on participants' sociodemographic characteristics and the importance of various delivery aspects were collected through two short surveys. In the survey for sociodemographic characteristics, participants were asked about their gender, age, highest level of education, employment status, monthly income, and the size of their place of residence. In the survey assessing the importance of different delivery aspects, respondents rated on a five-point Likert scale (1 = very low importance; 5 = great importance) the significance of delivery speed, cost, and pre-delivery notification to them (see Appendix D).

3.4. Research Methodology

The SEM analysis was performed using R for Windows v3.5 (R Core Team, 2022) with the "lavaan" package [140]. The adequacy of the model was evaluated through several fit indices: the Confirmatory Fit Index (CFI), the Tucker–Lewis Index (TLI), the Root Mean Square Error of Approximation (RMSEA), and the Standardized Root Mean Square Residual (SRMR). Following the recommendations of Hu and Bentler [141] and Bagozzi and Yi [142], a model fit was considered acceptable if the CFI and TLI were greater than 0.90, and both the RMSEA and SRMR were less than 0.08. The reliability of all dimensions and scales was assessed through the Cronbach's α coefficient (recommended values greater than 0.70; [143]), while the convergent validity of the model was assessed through the AVE coefficients (average variance extracted; recommended value AVE > 0.50). By comparing the square root of the average extracted variance with the highest correlation the construct achieves with the remaining constructs, the model's divergent validity was assessed according to the Fornell–Larcker criterion.

4. Results

4.1. Descriptive Statistics and Validity Measures

Descriptive statistics are presented in Table 2. In comparing the empirical mean with the theoretical mean ($\text{min} + \text{max}/2$), it is noteworthy that the empirical mean is lower than the theoretical mean for visual appeal, while for delivery efficiency, the customer satisfaction scale, delivery price and speed, and courier call, the empirical mean exceeds the theoretical mean. Parameters indicating the shape of the distribution (skewness and kurtosis) fell within an acceptable range (± 2.0 ; [144]), indicating that the assumption of normal distribution was not violated. The reliability of all dimensions and scales is adequate, in line with widely accepted criteria ($\alpha > 0.70$; [143]). When it comes to convergent validity, the AVE coefficients (average variance extracted) indicate that this prerequisite is met, with the exception of the delivery efficiency (LMD) dimension, whose AVE value is slightly below the critical value ($\text{AVE} > 0.50$). By comparing the square root of the average extracted variance with the highest correlation the construct achieves with the remaining constructs, it was concluded that the model's divergent validity, according to the Fornell–Larcker criterion, is adequate.

Table 2. Descriptive statistics parameters, reliability, and validity for LMD dimensions, customer satisfaction and trust in courier services scales, courier call, and delivery price and speed.

	Min	Max	Mean	SD	Sk	Ku	α	AVE	$\sqrt{\text{AVE}}$	r_{MAX}
Convenience (LMD)	3	15	10.19	2.83	−0.22	−0.33	0.73	0.50	0.71	0.46
Joyful anticipation (LMD)	3	15	11.87	3.11	−0.82	−0.16	0.89	0.73	0.86	0.55
Visual appeal (LMD)	3	15	6.73	3.45	0.67	−0.55	0.85	0.68	0.82	0.27
Pickup and courier contact (LMD)	4	20	14.14	3.65	−0.39	−0.35	0.75	0.50	0.70	0.59
Parcel tracking (LMD)	3	15	9.71	4.03	−0.12	−1.24	0.95	0.85	0.92	0.40
Delivery efficiency (LMD)	8	40	32.09	6.52	−0.94	0.59	0.87	0.45	0.67	0.55
Customer satisfaction scale	10	50	39.41	9.23	−0.69	−0.45	0.95	0.76	0.87	0.47
Trust in courier service scale	6	42	24.05	9.27	0.00	−0.80	0.94	0.51	0.72	0.59
Delivery price	1	5	4.21	0.96	−1.13	0.69	a	a	a	a
Delivery speed	1	5	4.29	0.91	−1.16	0.71	a	a	a	a
Courier call	1	5	4.07	1.14	−1.08	0.26	a	a	a	a

Note. NI—number of items. Min—minimal value. The minimal value also represents the number of items the scale consists of. Max—maximal value. Mean—arithmetic mean. SD—standard deviation. Sk—skewness. Ku—kurtosis. α —Cronbach's α coefficient, which is a measure of scale reliability. AVE—average variance extracted. $\sqrt{\text{AVE}}$ —AVE root mean square. r_{MAX} —maximal correlation with other constructs. a—coefficient cannot be computed for one-item measures. All analyses were conducted on a sample which comprised 907 participants.

4.2. Structural Equation Modeling

Structural equation modeling (SEM) was utilized to assess the predictive influence of several factors on customer satisfaction in LMD. The dimensions of the LMD questionnaire, trust in courier service, courier calls, and delivery price and speed, were designated as predictor variables, while customer satisfaction was treated as the criterion variable. The fit indices for the tested SEM model indicated overall good fit ($\chi^2 (794) = 3238.02$, $p < 0.001$, CFI = 0.906, TLI = 0.898, RMSEA = 0.058, SRMR = 0.068). Also, it should be noted that the TLI is slightly below the recommended value (0.900). Item loadings on all factors were greater than 0.60, with two exceptions: LMD48 on pickup and courier contact and LMD50 on delivery efficiency. All item loadings on the respective factors are shown in Appendix E. All relationships between customer satisfaction (the criterion) and the predictor variables were statistically significant and positive, with two exceptions. First, visual appeal exhibited a statistically significant but negative relationship with customer satisfaction, and second, parcel tracking was not a significant predictor of customer satisfaction. Based on the set of predictor variables, 44.15% of the variance in the criterion variable was explained. The structural model is presented in Figure 1.

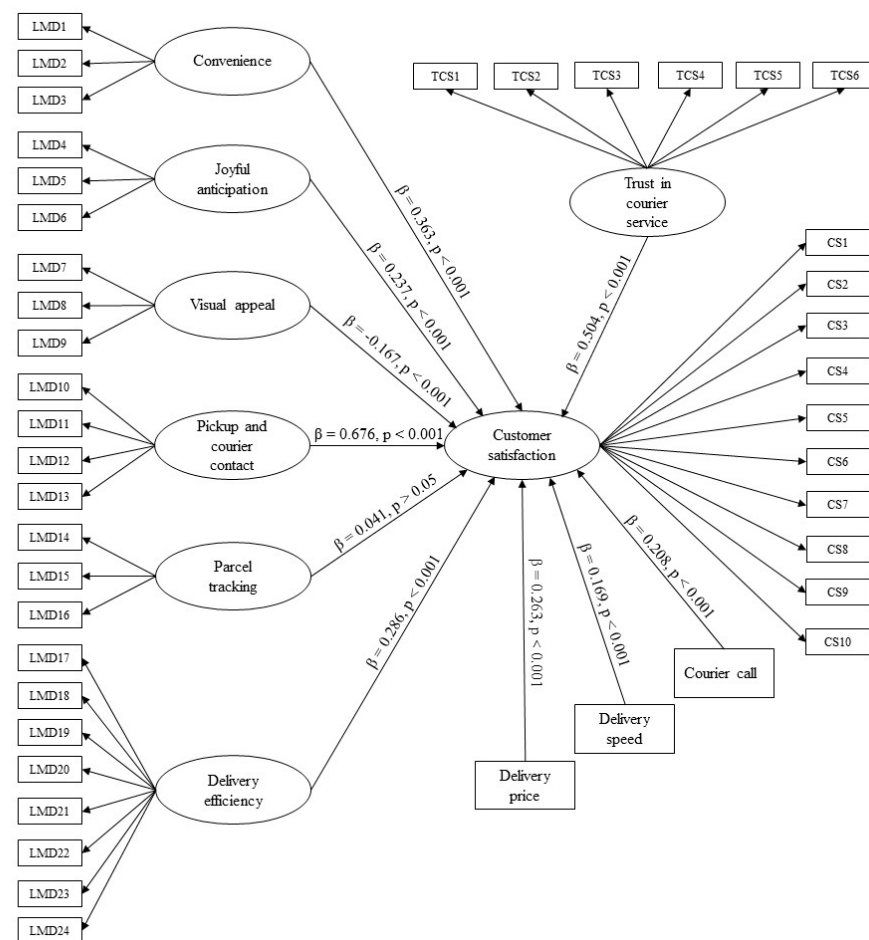


Figure 1. Structural model. Note: The factor loadings for items within the LMD questionnaire dimensions (LMD 1 to 24) varied from 0.553 to 0.948, all statistically significant at $p < 0.001$. For items related to trust in courier service (TCS 1 to 6), factor loadings ranged from 0.745 to 0.947, with each also showing significance at $p < 0.001$. Additionally, the factor loadings for items of customer satisfaction (CS 1 to 10) spanned from 0.699 to 0.856, and all were significant at $p < 0.001$.

5. Discussion

In this study, we set out to explore how different aspects of product delivery affect customer satisfaction in online shopping. We wanted to see which aspects, like trust in delivery services, the last-mile experience, pricing, delivery speed, and overall satisfaction, have the biggest impact. Using SEM, a method known for uncovering complex relationships between variables, we were able to gain more insights about the relationships beforehand.

Our analysis revealed key factors that strongly influence customer satisfaction in online shopping, offering valuable insights for researchers and businesses alike. Understanding these relationships can help companies refine delivery strategies to meet customer needs and expectations. In the next section, we will discuss our findings in more detail to shed light on how delivery factors shape customer satisfaction in e-commerce.

5.1. Aspects of User Experience in LMD

The research results indicate a connection between delivery efficiency and customer satisfaction in e-commerce, implying that delivery efficiency plays a role in meeting customer needs. These findings are consistent with prior research. Previous studies [145] emphasize that efficient delivery service is essential for customer satisfaction and building long-term relationships with customers. Furthermore, research [33,55] underscores that home delivery can contribute to a competitive advantage and increased customer satisfaction. These findings are supported by the work of other authors [60,64,65,68,146],

highlighting the positive impact of delivery efficiency on customer satisfaction. This result can be beneficial for all e-retailers in ensuring the careful selection of courier companies for product delivery services, as the results demonstrate that the efficiency of product delivery influences customer satisfaction.

Based on the results, the impact of joyful anticipation on customer satisfaction is evident. Previous work has highlighted that the consumer's emotional experience is built based on emotions and emotional states [147], with the expression of emotional reactions to the delivery depending on enjoyment, happiness, and excitement [148,149]. In this research, joyful anticipation is linked to positive emotional experiences for users throughout the delivery process, from the moment they place an order on the webshop to the moment they receive the product. Our results are aligned with previous research that states that users may feel excitement, happiness, or joy [89] when anticipating the delivery of their ordered package. This positive emotional experience can contribute to a better user experience by creating joyful anticipation and fostering positive emotions among users. Previous research has identified various emotional reactions in consumers [87,88,150], including feelings of satisfaction, happiness, and excitement [53,95,149,151]. This finding underscores the importance of creating a positive emotional experience for users while awaiting product delivery. It can result in increased customer loyalty, enhanced brand reputation, and overall improvement of the customer experience. Such insights can assist e-retailers in adjusting their marketing strategies and delivery processes to create a pleasant and encouraging experience for their customers.

The influence of convenience on satisfaction in the research results indicates that convenience has statistical significance for satisfaction. The literature often emphasizes that convenience is a factor motivating consumers to opt for online shopping instead of traditional shopping and that it impacts user satisfaction [53,99–102,151,152]. However, Berry and colleagues [107] note that previous research has mainly focused on convenience from the time-saving component, with only a small number focusing on the effort component, and there is insufficient research on the convenience of the service provided. The questions constituting the convenience factor in the study were focused on the perception of the convenience of product delivery to the home address compared to traditional shopping. These questions relate to the perception of the usefulness of home delivery compared to going to a store, the perception of interest compared to classic shopping, and the perception of reduced effort when delivering ordered goods to the home address compared to going to a traditional store. These results can be explained by users perceiving the convenience of home delivery as an inseparable characteristic of the home delivery model and that it can be an important component of the user experience in the “last-mile” delivery process. The research results indicate that visual aspects have a statistically significant negative impact on user satisfaction ($\beta = -0.167$). This means that users who attach less importance to visual aspects during delivery, such as the appearance of the delivery person, visual impression during delivery of goods, or appearance of the delivery vehicle, show higher satisfaction. It is possible that users are less inclined to expectations based on visual impressions, thus being less susceptible to dissatisfaction if visual aspects do not meet their expectations. These results somewhat align with the study conducted by Trancinski and Lowengart [86], which highlighted that aesthetics may not necessarily have a positive impact on attitudes towards a website, but rather, that the impact could be neutral or even negative. It is possible that respondents in this study considered visual aspects less important than other delivery aspects.

Regarding the correlation between package tracking and user satisfaction, based on the research results, we see that package tracking did not significantly predict user satisfaction; that is, the package tracking factor does not influence user satisfaction with e-commerce. This may be because most logistics providers have introduced the “package tracking status” option in the previous period. When most logistics providers offer the option of package tracking, competition can be high, and differences in the quality of package tracking status provision between providers may be less significant. This can influence the lack of statistical

significance because package tracking has become a standard practice for most providers, with little variation in quality or how the service is provided. Similar conclusions are presented by Stefan Hepp [73], who emphasizes that although package tracking is an extremely important factor for the success of LMD, users may expect it as a standard part of the service. Another reason why package tracking is not associated with satisfaction may be that users do not have high expectations regarding package tracking or have realistic expectations about delivery time for longer delivery times. In those situations, they do not need to check the status of the package. For example, if delivery is expected to take several weeks and users accept this as a realistic delivery time, package tracking does not affect their satisfaction. The importance of package tracking for users may be less significant depending on the type of product being delivered; if it is inexpensive or less valuable items that are often ordered, users may not need to track every stage of delivery, whereas when it comes to delivering expensive or sensitive items, tracking may be more important for the security or concern about the condition of the product during transport.

The research results have indicated a significant influence of the last stage of product delivery, product pickup, and contact with the delivery person on overall user satisfaction. This result is particularly interesting because it aligns with the widespread opinion among online users in Serbia, who often express dissatisfaction with the behavior and attitude of delivery persons delivering products to them. This can be observed in conversations with e-commerce users and online user comments. This result may suggest that positive user experience and satisfaction are achieved through the last stage of product delivery and interaction with the delivery person. This is somewhat in line with the literature that emphasizes that user satisfaction levels may vary during certain stages of online shopping. After the last stage of product delivery, there may be a decrease or increase in satisfaction depending on the quality of the delivery service and the behavior of the delivery person [53–55,62,98,122,123]. Previous work showed that inappropriate behavior and inflexibility negatively affect the user experience [153]. It is important that the product pickup process is simple and pleasant for the user, which can result in repeat purchases from the same e-retailer. A positive experience during contact with the delivery person can further enhance user satisfaction and make the delivery process a positive experience. Therefore, logistics service providers are advised to pay attention to this part of the service to ensure positive interaction between the delivery person and the customer and to provide simple product pickup processes that will facilitate users to quickly and efficiently pick up their products [72].

Based on the research results, we can conclude that hypothesis H1—aspects of the user experience positively influence user satisfaction in the process of product delivery—is partially confirmed. While delivery aspects such as delivery efficiency, pickup and contact with the delivery person, joyful anticipation, and convenience had statistical significance in achieving satisfaction, package tracking did not show a statistically significant impact. Visual aspects had a statistically significant but negative impact.

5.2. Delivery Aspects

Regarding delivery aspects (delivery cost, delivery speed, and pre-delivery contact with the delivery person), the research results show a significant relationship between delivery cost and user satisfaction in e-commerce, indicating that lower delivery costs are associated with higher satisfaction. These results align with previous studies highlighting the role of delivery cost in the choice of service providers and how lower costs can increase the attractiveness of products or services. In their research, Joerss et al. [113] reported that 70% of consumers are interested in the cheapest option for home delivery, indicating that lower delivery costs can increase the perceived value customers receive from their purchases. Lower delivery costs can make customers feel they are getting better value for their money and receiving an accessible and efficient delivery service. In the competitive e-commerce environment, lower delivery service costs can be an advantage that attracts more customers and improves the overall shopping experience. These findings emphasize

the importance of providing affordable delivery options to increase customer satisfaction and achieve a competitive advantage in the expanding e-market.

Regarding delivery speed, the research results showed that delivery speed significantly impacts user satisfaction. Delivery speed is often considered a factor in achieving customer satisfaction in logistics. Researchers such as [116,118–120] have noted in their studies that in the context of logistics, abilities such as fast and reliable delivery affect customer satisfaction, and e-commerce customers are demanding delivery speed. Fast delivery allows customers to receive their products quickly, contributing to their satisfaction and meeting their expectations. In the digital age, where users are accustomed to instant results and fast processes, the expectation of fast delivery becomes increasingly important. This aspect of delivery becomes significant in the competitive e-commerce environment, where customers often choose sellers and logistics providers who can offer fast delivery to meet their needs in a short period.

Regarding the delivery aspect—pre-delivery contact with the delivery person—the research results indicate a statistically significant relationship between pre-delivery contact with the delivery person and user satisfaction in e-commerce, with a positive effect on satisfaction. Mentzer et al. [80] developed a scale that measures nine concepts to determine users' perception of provided logistics services, one of which is the quality of personal contact, which in the context of this research can certainly refer to pre-delivery contact with the delivery person. Vrhovac et al. [72] concluded in their work that pre-delivery contact with the delivery person provides customers with a sense of involvement in the delivery process and security and information. A delivery person who contacts the customer can adapt to specific customer requirements or preferences, such as changing delivery times or locations when customers are not at home. If a problem or doubt arises during the conversation, the delivery person can react quickly and resolve the issue. This approach demonstrates dedication, care for the customer, and a certain degree of service personalization. Personalization can contribute to a sense of uniqueness and attention to the customer, which can positively impact their satisfaction. This result can benefit both e-retailers and logistics companies by providing insight into the importance of personalization and effective communication during product delivery to improve overall customer satisfaction and gain a competitive advantage in the market.

Our research result that the courier call has a significant relationship with the delivery user experience aligns with previous research that shows that the communication between the courier and the customer significantly affects user perception of customer service quality [154]. Our results suggest that implementing the practice of having the courier call the customer before the actual delivery is an important step in enhancing the customer experience. The pre-delivery call from the driver is an effective way to improve communication between the service provider and the customer, which positively impacts the perception of service quality [155]. Recent findings indicate that customer expectations regarding LMD are changing: 65% of customers desire greater flexibility, 29% have changed the time and location of delivery, and another 50% would do so if the option were available [153], underscoring the significance of implementing pre-delivery calls by drivers as it would enable delivery time changes and help prevent failed deliveries.

By calling customers before delivery, logistics providers can ensure that customers are present or provide alternative options for package pickup. This reduces the number of failed deliveries and delivery attempts, thereby lowering operational costs and increasing efficiency. This practice would contribute to greater customer satisfaction, reduce uncertainty, and enable service customization to meet customer needs, thereby enhancing the overall last-mile delivery experience.

In conclusion, hypothesis H2—delivery aspects have a positive impact on user satisfaction in the process of product delivery—was confirmed through the analysis of the following factors: delivery cost, delivery speed, and pre-delivery contact with the delivery person.

5.3. Trust in Courier Services

Regarding the influence of trust in courier services on user satisfaction in e-commerce, research results indicate statistical significance ($p < 0.001$), with a positive effect of this influence. These results demonstrate that trust in courier services plays a role in achieving user satisfaction in e-commerce. The scale of trust in courier services is based on the subscale by Ejdyś and Gulc [97], who, in their work, identify trust as one of the key factors of e-user satisfaction. Uzir et al. [55] also emphasize that trust in service providers (logistics providers/courier services) contributes to customer satisfaction. The questions constituting the trust factor relate to key aspects of user trust in courier companies during online shopping. The survey question “When I shop online, I trust courier companies and their services” examines user trust in courier companies during online shopping. If users trust courier companies, they will feel safer during online transactions and expect reliable delivery. “I trust the technical solutions of courier companies when I shop online” refers to user trust in the technical solutions used by courier companies, such as security measures applied during transport. “I am confident in the reliability of courier companies when I shop online” examines users’ belief in the reliability of courier companies during the delivery of purchased products. Reliability refers to delivery according to promises, preservation of shipment integrity, and accuracy of delivery information. “I am confident that I can rely on courier services” examines user trust in the services provided by courier companies. Users feel safer and more satisfied when they believe they can rely on courier companies to successfully deliver their shipments. “Courier companies take into account what is most important to me” focuses on adapting the services of courier companies to the individual needs of users. If users believe that courier companies care about their needs and preferences, they are likely to have greater trust in them and be more satisfied with their services. “In the future, I will use courier companies even more often” examines users’ intention to continue using courier services in the future. If users trust courier companies and have a positive experience, they will be more motivated to continue using their services. These questions provide insight into various aspects of user trust in courier companies and how trust can affect their satisfaction and intention to use services in the future. In summary, the positive influence of trust in courier services on user satisfaction indicates a positive effect of trust on users’ perception of service quality.

Based on the research results, hypothesis H3—trust in courier services has a positive impact on customer satisfaction in the process of product delivery—is confirmed.

6. Conclusions

The primary goal of this research was to identify factors influencing user satisfaction in the LMD process through the application of structural equation modeling. After the analysis, several important factors influencing overall user satisfaction during the product delivery process were identified. To better structure the diversity of factors and highlight their importance, the authors propose classifying them into two main categories: “empirical factors” and “hygiene factors” [156–158]. This classification helps to clearly identify the factors that truly contribute to increased user satisfaction in the delivery process, as well as to understand which factors are implicit and expected by users.

“Empirical factors” in the context of this research are those factors identified as influencing user satisfaction based on research results (convenience, joyful anticipation, delivery efficiency, pickup and contact (interaction with the courier), delivery speed, delivery cost, courier call, and trust in courier services). “Hygiene factors” are basic workplace conditions that, when present, usually do not bring about particular satisfaction or motivation, but their absence can cause dissatisfaction and demotivation. These factors are important to prevent or minimize dissatisfaction among employees [156–160]. In the context of this research, “hygiene factors” represent the parcel tracking factor, which, although it does not directly contribute to user satisfaction, plays a role in preventing dissatisfaction and negative user experiences. Understanding and properly classifying these factors helps e-retailers and logistics providers improve the delivery process and optimize the user

experience, which can result in increased user satisfaction and brand loyalty. Additionally, the classification can be beneficial for managers to understand priorities better and focus on key improvement points in the delivery process.

6.1. Practical and Theoretical Implications

In the rapidly evolving world of e-commerce, the delivery experience plays a pivotal role in shaping customer satisfaction and loyalty. This study explored several critical aspects of enhancing user trust in courier services, emphasizing the importance of building strong relationships between e-retailers, logistics providers, and customers. By focusing on trust, e-retailers and logistics providers can drive customer loyalty, encourage repeat purchases, and garner positive reviews. Key strategies include collecting feedback and resolving issues promptly, leveraging technological advancements for better transparency and efficiency, and adopting personalized communication practices. Additionally, special attention to the last phase of the last-mile delivery phase is crucial, as it significantly impacts the delivery user experience. This research contributes to theoretical frameworks in product delivery, identifying and integrating new factors that influence user satisfaction, thus enriching existing theories and inspiring further exploration in this dynamic field. The following text explores the practical implications:

Loyalty and repeat purchases: E-retailers and logistics providers should prioritize initiatives that build and maintain user trust. This can be achieved through transparent communication, consistent service quality, and reliable delivery times, leading to increased customer loyalty and higher rates of repeat purchases.

Transparency and efficiency: Providing customers with real-time updates and transparent information about their delivery status can reduce anxiety and build confidence in the service. Technologies that streamline delivery processes and reduce errors also contribute to a more reliable and trustworthy service.

Pre-delivery calls: Logistics providers should incorporate regular pre-delivery calls or messages to inform customers about the exact timing of their delivery. This personalized approach demonstrates attention to customer needs and can significantly enhance the user experience.

Customer care: Personalized communication, such as customized delivery instructions and follow-up messages, shows that the provider values the customer, fostering a sense of care and building long-term trust.

The following aspects focus on the last phase of LMD:

Comprehensive user experience: Special focus on the last-mile delivery phase is crucial for improving customer satisfaction. Strategies like pre-courier calls, allowing customers to track the courier in real-time, and offering flexible delivery options can greatly enhance the user experience.

Courier interaction: Training couriers to provide exceptional customer service during the delivery process, including friendly interactions and accommodating specific customer requests, can leave a lasting positive impression and strengthen trust in the delivery service.

By implementing these practical strategies, e-retailers and logistics providers can enhance user trust, resulting in greater customer loyalty, increased repeat purchases, and a positive reputation in the competitive e-commerce market.

This research provides a significant contribution to the development of theoretical frameworks in the field of product delivery, particularly focusing on factors influencing user satisfaction in e-commerce. Identifying these factors not only contributes to existing theories of user experience and satisfaction but also provides a basis for developing new theoretical models that integrate a wider range of factors. Furthermore, the study expands theories of the “last mile” in product delivery, exploring the role of couriers in user experience in a way that has not been adequately explored before. This new perspective can contribute to improving theories that examine the impact of courier contact, interaction during product pickup, and the last phase of delivery. Moreover, this study inspires further exploration in this area, urging researchers to explore the complexity and dynamics of this process in

different contexts. Developing new theoretical models and further researching these factors could enrich theoretical models of user experience and satisfaction in product delivery, providing a deeper understanding of this key process in e-commerce.

6.2. Limitations and Future Directions

Like all research, this study has certain limitations, which also become recommendations for further research in this area. One of the interesting results of this research indicated that parcel tracking does not have a statistically significant effect on user satisfaction in e-commerce. Although these results were interpreted in the context of hygiene factors, something that has already become expected and implicit in online shopping, these findings should certainly be verified in future studies. In relation to this, a guideline for future research could be to pose the following question: does parcel tracking perception serve as a “hygiene factor” in the sample of respondents accustomed to parcel tracking (respondents included in this study) and in the sample of respondents who did not have the opportunity to track parcels during online shopping? Additionally, researchers can explore interactions between different factors in different contexts. For example, how does the factor of trust in courier services manifest in situations where users encounter delivery problems, and how does this interaction affect overall user satisfaction? Researchers need to adopt a more comprehensive approach to analyzing user experience, taking into account different circumstances and contexts.

It is possible to assume that other factors not covered in this research may have a significant impact on individual variables that are central to this research. For example, socioeconomic conditions and consumer purchasing power may have both direct and indirect effects on the relationship between satisfaction and different predictive factors. Additionally, the last step of product delivery, namely the step of pickup and contact, may be one of the key variables in the context of user satisfaction, so further research on this aspect of delivery is necessary.

A key recommendation for future research in this field is the implementation of a longitudinal study design. This approach would allow us to collect valuable data over time, providing insights into how the factors influencing customer satisfaction in LMD can fluctuate. By observing these changes, we can gain a deeper understanding of the dynamics at play and how they evolve over time, thereby enhancing our ability to predict and respond to customer needs effectively.

User satisfaction in the product delivery process is a complex process that requires careful consideration of various factors. Through this research, key aspects that influence user satisfaction in e-commerce have been identified, which was the main goal of the research. In conclusion, continuous research in the field of product delivery is important to achieve continuous improvement in user experience and customer satisfaction, which contributes to the development of e-commerce and logistics services.

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Appendix A

Customer Satisfaction Scale

Remember your last experience with online shopping and package delivery. Please rate the following aspects of that specific purchase and delivery experience, where number 1 means “very dissatisfied” and number 5 means “very satisfied”:

- Information about the delivery status (for tracking the shipment)
- Agreement on package pickup
- Accuracy of delivery
- Behavior of the delivery person when picking up the package
- Delivery location
- Overall satisfaction with the courier service or delivery method
- Overall satisfaction with the online shopping process
- I would recommend online shopping to close acquaintances
- I am satisfied with this online seller
- Condition of the product upon delivery (not damaged)

Appendix B

Trust in Courier Service

1. I trust courier companies and their services when I shop online.
2. I trust the technical solutions of courier companies when I shop online.
3. I am confident in the reliability of courier companies when I shop online.
4. I am confident that I can trust the services of courier companies.
5. Courier companies take into account what is most important to me.
6. In the future, I will use courier companies more often.

Appendix C

LMD Questions

LMD8—I perceive order delivery as an interesting alternative to ordinary shopping.

LMD9—I see the delivery of ordered goods as a useful alternative to classic shopping in a store.

LMD24—It takes less effort to have the goods delivered to me versus going to the store.

LMD13—I look forward to the delivery of something I ordered.

LMD14—I am eagerly awaiting the delivery of the ordered items.

LMD19—I am happy when I need to collect the shipment I ordered.

LMD37—The appearance of the delivery vehicle is an important aspect of the shopping experience for me.

LMD41—The appearance of the package delivery person is an important aspect to me in the delivery experience.

LMD42—The visual impression during the delivery of the goods is important to me.

LMD45—Contact with package delivery people is a pleasant experience for me.

LMD47—The delivery of the ordered goods is easy for me.

LMD48—I do not care who delivers my package.

LMD10—I like to track the delivery of what I ordered.

LMD11—I would like to know where my package is at the moment.

LMD12—I check the status of the shipment as it travels towards me.

LMD25—I am loyal to companies that have a well-managed delivery process.

LMD26—I will easily give up on those who are unreliable in delivering their products.

LMD28—When I am disappointed in the delivery of something, I do not buy from that place anymore.

LMD30—I am happy to order goods from vendors with whom I have no problems with former deliveries.

LMD36—I like when packages delivered to me are tightly packed.

LMD39—I will change vendors if they poorly handle their deliveries.

LMD50—During delivery pick up, I check whether the package is damaged.

LMD44—I will often buy from those with whom my goods are delivered seamlessly.

Appendix D

Importance of Delivery Aspects

- Delivery price
- Delivery speed
- Courier call before delivery

Appendix E

Factor Loading

	Convenience	Joyful Anticipation	Visual Appeal	Pickup and Courier Contact	Parcel Tracking	Delivery Efficiency	Customer Satisfaction	Trust in Courier Service
LMD8	0.683							
LMD9	0.793							
LMD24	0.611							
LMD13		0.887						
LMD14		0.905						
LMD19		0.773						
LMD37			0.680					
LMD41			0.904					
LMD42			0.858					
LMD45				0.673				
LMD47				0.863				
LMD48				0.597				
LMD10					0.921			
LMD11					0.948			
LMD12					0.904			
LMD25						0.678		
LMD26						0.639		
LMD28						0.655		
LMD30						0.810		
LMD36						0.659		
LMD39						0.634		
LMD50						0.553		
LMD44						0.764		
TCS1							0.881	
TCS2							0.893	
TCS3							0.947	
TCS4							0.944	
TCS5							0.745	
TCS6							0.797	
CS1								0.699
CS2								0.832
CS3								0.837
CS4								0.796
CS5								0.735
CS6								0.856
CS7								0.834
CS8								0.767
CS9								0.803
CS10								0.701

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