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Change Log

| Version | Description of change |
|---------|-----------------------------|
| V0.1 | Initial version preparation |
| V0.2 | Version sent for review |
| V1.0 | Final version |
| | |
| | |
| | |

List of abbreviations

| Abbreviation/Term | Description |
|-------------------|--|
| CA | Consortium Agreement |
| D | Deliverable |
| DOA | Description of Action |
| EC | European Commission |
| EU | European Union |
| GA | Grant Agreement |
| KPI | Key Performance Indicator |
| MS | Milestone |
| PC | Project Coordinator |
| PO | Project Officer |
| PRISMA | Preferred Reporting Items for Systematic Reviews and Meta-Analysis |
| PSC | Project Steering Committee |
| SAB | Stakeholders Advisory Board |
| WP | Work Package |
| WPL | Work Package Leader |



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Executive Summary

Digital marketplaces and e-commerce platforms necessitate targeted consumer engagement strategies to create tailored experiences for distinct audience segments. In order to achieve customer segmentation, marketers construct personas, which, through analyzing behavioral patterns, preferences, and motivations, offer comprehensive profiling. Personas can be constructed based on demographic information (age, gender, income and educational level, marital status, etc.), psychographic insights (values and beliefs, lifestyle preferences, interests and hobbies, personality traits, etc.), historical interactions with a brand, social media usage, or a combination of the above.

The objective of this deliverable is to investigate the pivotal role of e-commerce consumer personas in relation to goods' deliveries and returns and to develop at least eight (8) personas. These personas will later be matched with behavioral interventions to encourage sustainable delivery and return options. In anticipation of demand and behavioral data from the five GreenTurn pilots, a systematic literature review, adhering to PRISMA guidelines, was conducted to bridge the gap between personas, market dynamics, and last-mile delivery/return options.

Analysis' key findings revealed significant patterns linking personas with delivery and return behaviors. Specifically, consumer personas were clustered as follows: 1) *Time-Savers*; 2) *Brand Seekers*; 3) *Review Enthusiasts*; 4) *Family-Centric*; 5) *Health-Conscious*; 6) *Cultural Guardians*; 7) *Tech-Savvy Shoppers*; 8) *Social Shoppers*; 9) *Cost-Conscious*; 10) *Impulsive Buyers*; 11) *Global Explorers*; 12) *Premium Shoppers*. Additionally, various incentives and nudging mechanisms were identified that can influence these personas to adopt more sustainable delivery and return choices. Examples include discounts for slower, eco-friendly delivery options, extended return windows for sustainable practices, and gamification strategies to encourage green behaviors.

The proposed personas serve as an initial framework and will undergo further validation. Task 2.3 (Behavioral Modeling) will provide empirical results based on a questionnaire, while Task 2.2 will engage directly with consumers and retailers to uncover deeper insights into their needs, preferences, and barriers to adopting sustainable delivery and return options. This dual-validation process ensures that the personas are robust and actionable, ultimately supporting the development of effective, sustainable strategies in last-mile logistics.

1. Introduction

The exponential growth of e-commerce has fundamentally reshaped how consumers purchase and manage goods. E-commerce provides consumers with immediate access to products worldwide, offering unparalleled convenience and cost benefits. However, it also introduces challenges that necessitate efficient solutions for order fulfilment and returns (Nanda & Patnaik, 2023).

Delivery processes are pivotal in determining customer satisfaction, as they directly impact perceptions of service quality (Uzir et al., 2021). Today's consumers demand fast, reliable, and flexible deliveries - a requirement that becomes increasingly complex as online order volumes will continue to surge. Similarly, seamless and cost-free return processes are now considered a standard expectation, with any delays or inefficiencies risking customer dissatisfaction and brand damage (Karlsson et al., 2023). Managing these processes is also crucial from a financial perspective, as returns often incur substantial costs for transport and repackaging.

The environmental impact of delivery and return operations adds another layer of complexity. As online shopping grows, the increased transportation needs and packaging waste associated with returns amplify the carbon footprint of businesses (Kim et al., 2022). With sustainability gaining prominence, consumers are increasingly drawn to companies that adopt eco-friendly practices, such as recyclable packaging or parcel lockers for returns and pickups. By addressing these environmental concerns, businesses can attract sustainability-conscious customers while reducing their ecological footprint.

The shift towards e-commerce and digital marketplaces necessitates targeted consumer engagement strategies to create tailored experiences for distinct audience segments. To achieve customer segmentation, marketers create personas which, through analyzing behavioral patterns, preferences, and motivations, offer comprehensive profiling. The profiling can be constructed based on demographic information (age, gender, income and educational level, marital status, etc.), psychographic insights (values and beliefs, lifestyle preferences, interests and hobbies, personality traits, etc.), historical interactions with a brand, social media usage or a combination of the previous (Gomes & Meisen, 2023).

Effective customer segmentation is crucial for e-commerce businesses aiming to tailor not only their marketing strategies but also various operational aspects, such as website content, logistics options, and product offerings, to enhance customer experiences (Beckers and Cant, 2023). By categorizing consumers into distinct groups based on shared characteristics, such as demographics, purchase behavior, and preferences, companies can uncover actionable insights that drive engagement and conversion rates as businesses can better meet the needs of their customers (Wu et al., 2023).

This understanding allows businesses to craft personalized marketing messages that resonate more deeply with each segment, ultimately fostering brand loyalty and increasing customer lifetime value (An et al., 2018). Furthermore, leveraging data analytics tools in the segmentation process enables e-commerce platforms to rapidly adapt to evolving consumer trends and emerging market demands, ensuring sustained competitive advantage in a dynamic

landscape (Abidar et al., 2024). As companies adopt a more granular approach to customer segmentation, they not only optimize resource allocation but also unlock opportunities for targeted promotions and improved product development, solidifying their market position and enhancing overall profitability (Jansen et al., 2022).

Offering incentives is among the most effective strategies for managing deliveries and returns in e-commerce. Incentives provided by businesses can enhance customer experience, boost loyalty, and reduce costs associated with returns. They also promote responsible consumer behavior, driving sustainability and better inventory management (Stevenson & Rieck, 2024).

A common delivery incentive is free shipping for orders above a specific amount. This approach encourages consumers to increase their order value, thereby boosting sales while minimizing low-value orders that may inflate transportation costs. Moreover, free shipping enhances the shopping experience and fosters customer loyalty (Wang et al., 2023). While offering free shipping encourages consumers, it's important to consider potential drawbacks. This strategy might inadvertently promote unnecessary consumption, leading to increased transportation demand and, consequently, greater environmental impacts.

For returns, many companies offer discounts or store credits for future purchases to consumers who avoid returning products or opt for returns through lockers (Shopify, 2023). Such incentives reward consumers for responsible behavior while reducing operational costs for businesses. Additionally, companies may offer extra reward points to customers who return products to designated drop-off points instead of opting for home pick-ups. While this strategy can minimize transportation and support environmental sustainability from a logistics operations perspective, it is important to consider the potential environmental impact if consumers drive personal vehicles to reach these drop-off points. To mitigate this, businesses could prioritize drop-off points in locations accessible by walking, biking, or public transportation. Moreover, some companies provide immediate discounts to consumers who commit not to return a product or who choose standard shipping over express delivery. This encourages customers to select cost-effective and sustainable options, especially when fast delivery is not essential. This approach benefits both parties—customers enjoy a discount, and companies reduce the need for more expensive and energy-intensive deliveries.

Incentives can also strengthen consumer loyalty. Businesses may offer exclusive perks, such as free returns or express delivery, to members of their loyalty programs or customers who meet a specific purchase threshold. This fosters a sense of belonging to a valued community, increasing the likelihood of repeat purchases.

Incentives play a critical role in improving e-commerce delivery and return processes. Through small, well-designed rewards, businesses can influence consumer behavior, enhance operational efficiency, and advance sustainability. Implementing these strategies can reduce costs, increase customer satisfaction, and strengthen a company's reputation in the competitive e-commerce landscape (Dietl et al., 2024).

The motivation for GreenTurn's research is that there are only scarce attempts that examine the role of personas amidst the rise of e-commerce and digital analytics (Salminen et al., 2018; An et al., 2018). Another driving factor, is that, excluding research focused on the e-commerce consumer personas and behavior changes, there is no literature addressing the bridging

of personas with and market dynamics with last mile delivery / return options. The literature review included studies: i) focusing on factors influencing e-commerce adoption such as technological infrastructure, trust, and socio-economic conditions (Hendricks & Mwapwele, 2024), (ii) exploring consumer behavior (Pundir et al., 2024; Xin et al., 2024; Bhykya & Paul, 2023; Zhang & Benyousef, 2016), and (iii) understanding behavioral change related to e-commerce deliveries (Wang et al., 2023; Campisi et al., 2023; Cruz-Cardenas et al., 2021), while returns are largely unaddressed in the existing literature.

To fill in these research gaps, the objective of this deliverable is to investigate the pivotal role of e-commerce consumer personas in relation to goods' deliveries / returns. To achieve that, a systematic literature review is performed, based on the PRISMA guidelines, to identify relevant records that bridge the gap between personas and market dynamics with last mile delivery / return options. Specifically, the purpose is twofold; first to understand how different personas behave with respect to delivery / return services or policies; and second, to identify underlying incentives and nudging mechanisms that could potentially affect them, in order to change towards most sustainable options. Two interchangeable Research Questions (RQ) arise:

- RQ1: How do different e-commerce consumer personas behave in relation to delivery and return services or policies?
- RQ2: What incentives and nudging mechanisms can influence e-commerce consumer personas to adopt more sustainable delivery and return options?

The rest of the deliverable is structured as follows: Section 2 describes the European E-Commerce market providing statistics, Section 3 presents the Methodology for developing the current deliverable as well as details the systematic literature review process, including the search strategy, screening criteria, and data analysis methods. Section 3 presents the key findings. Section 4 presents the descriptive analysis of the included studies, while Section 5 presents key the findings. Finally, Section 6 presents the results of synthesizing the information collected and analysed and Section 7 concludes the deliverable and identifies areas for future research.

2. European E-Commerce

According to the European E-Commerce Report of 2024 (EECR, 2024), in 2023 total B2C European e-commerce turnover increased by 3% (from €864 billion to €887 billion). In 2024 internet usage increased from 87% in 2019 to 92% in 2023, revealing a trend to increase even more in 2024.

Specifically, for the year 2023, internet users (as a percentage of the population aged 16-74 accessing the internet) were higher in Spain and Austria (96%), followed by France (94%), Poland (88%) and finally Greece (86%). However, the percentage of e-shoppers (percentage of the population aged 16-74 who bought goods or services online) for the same year are significantly lower: France (77%), Austria (72%), Spain (69%), Poland (64%) and Greece (58%), revealing the existing potential for all five (5) countries/ markets to attract more internet users to implement their shopping through the net. At the same time, the observed difference between the percentages of internet users and e-shoppers could be due to various factors, such as limited availability of local online shops, logistics constraints, language barriers for accessing

international stores, or even a lack of trust in online transactions, rather than solely individual preferences.

When it comes to the percentage of GDP comprised of e-commerce sales (E-GDP) Greece has the second higher percentage among the 38 countries examined in the EECR report and the highest percentage among the 5 pilot countries of the project. Specifically, Greece with 7.87% scores the highest percentage, followed by Spain (5.76%), France (5.71%), Poland (5.13%) and finally Austria (1.95%). It must be noted that in all 5 countries the B2C e-commerce growth rate for the year 2023 was positive (Poland 17%, Spain 16%, France 11%, Greece 9% and Austria 4%). The leading country concerning GDP for the year 2023 was France (€2.8 trillions), Spain (€1.46 trillions), Poland (€750billion), Austria (€480billion) and finally Greece (€220billion) (Statista, 2024).

Another interesting finding from the above-mentioned report, concerns the percentages of online purchasing by sellers' origin country as presented in Table 1, as a share of individuals purchasing online in the last 3 months of 2023.

| Sellers' origin country | National | Other EU countries | Rest of the world |
|-------------------------|----------|--------------------|-------------------|
| Austria | 71% | 16% | 9% |
| France | 76% | 39% | 31% |
| Greece | 86% | 28% | 12% |
| Poland | 94% | 13% | 7% |
| Spain | 91% | 32% | 29% |

Table 1. Percentages of online purchases nationally and cross-border (last 3 months of 2023)

Austria

Though the EU's Corporate Sustainability Due Diligence Directive and other measures are gaining traction and present implementation issues, Austria does not currently have any plans to enact any new national e-commerce rules. High inflation has hampered the trend toward sustainable products, but it is predicted to pick back up. Reusable packaging options are becoming more and more popular as the second-hand market expands. With rapid commerce platforms joining the market, Austrian e-commerce retailers are concentrating on adjusting to new market problems and investing in AI. Due to shipping costs, consumers are choosing in-store pickup choices, and the retail industry is facing pressure from rising living expenses and evolving consumer purchasing patterns.

France

The Digital Services Act and Digital Markets Act are two important EU digital laws that France is enforcing, which will have an effect on competition and e-commerce platforms. Due to economic and environmental factors, the second-hand market has increased to account for 11% of internet sales. Just 15% of French SMEs have online sales solutions, indicating that they are still having difficulty digitizing. With 71% of companies now utilizing AI-based solutions, AI is a top priority. "Buy Now, Pay Later" and delivery collection locations are becoming more and more



common. With the help of sophisticated transportation and logistics infrastructure, e-commerce continues to play a significant role in French consumer behavior.

Greece

The Digital Services Act (DSA) was adopted by the Greek Parliament on April 5, 2024, through Law 5099/2024, aiming to create a safe, predictable, and trusted online environment by regulating digital services. This law assigns the Hellenic Telecommunications and Post Commission (EETT) as the national Digital Services Coordinator. It mandates that service providers take action against illegal content, provide information to authorities, and ensure transparency in their terms of service and content moderation policies. Penalties for non-compliance can include significant fines and operational restrictions. The DSA's implementation in Greece is intended to protect users' rights, foster innovation, and maintain a fair digital landscape (Lambadarios, 2024). Law 4967/2022, enacted in Greece on September 9, 2022, transposes EU Directives (EU) 2019/770 and (EU) 2019/771 into Greek law, aiming to enhance consumer protection and legal certainty in digital transactions. It introduces a framework for contracts involving digital content and services, defining "digital content" as data produced and provided in digital form, and "digital services" as services allowing data creation, editing, storage, or access. The law applies to consumers and sets supplier obligations, including liability for non-conforming digital content or services and requirements for security updates. It also amends the Greek Civil Code to include digital elements in sales contracts (Politis & Partners, 2023). According to the Hellenic Telecommunications & Post Commission (EETT, 2023) there is a significant increase of automated parcel lockers in Greece between 2021 (255) and 2023 (5,570); an increase of 2084.31% in just two years.

Poland

Poland is putting into effect a number of European and national laws that will affect e-commerce, such as the Data Act and the Digital Services Act. Customers are becoming more interested in sustainable items, and they are even willing to pay more for environmentally friendly packaging and wait for consolidated delivery. Only 36% of customers believe that returns are bad for the environment, despite efforts to draw attention to this fact. AI is being used more and more by Polish e-tailers for automation and customer support. They will prioritize automation, big data, and artificial intelligence in 2024. Nowadays, out-of-home deliveries are the most popular delivery option, and BLIK is the favored payment method. 87% of internet users routinely make purchases online, indicating a rise in e-commerce due to cost efficiency and inflation. The practice of purchasing and reselling secondhand goods becoming more popular.

Spain

E-commerce in Spain is being impacted by a number of national and European legal efforts, including the Green Claims Directive and the Product Liability Directive. Sustainability is becoming more important, as evidenced by the fact that 45% of Spanish consumers are willing to pay more for sustainable goods. Businesses are adjusting by improving packaging and providing used and environmentally friendly goods. However, businesses are tackling sustainability issues by encouraging in-store returns and implementing smart lockers in response to Spain's high e-commerce return rate. Because of government measures, Spanish SMEs have intensified their attempts to transition digitally, increasing their competitiveness.

Big data, blockchain, AI, AR/VR, and IoT are among the technologies that are being used more and more to improve logistics, manage inventories, and improve shopping experiences. These patterns highlight how Spanish e-commerce is changing due to environmental and legal developments.

Another interesting finding of the EECR 2024 report concerns the Infrastructure, Logistics & Sustainability rankings. For the 5 participating countries, the results are presented in Table 2.

| Country | Logistics Performance Index (2023) | E-Government Development Index (2022) | Inclusive Internet Index (2022) | Environmental Performance Index Ranking (2024) | SDG Index Ranking (2023) |
|----------------|------------------------------------|---------------------------------------|---------------------------------|--|--------------------------|
| Austria | 7 | 20 | 32 | 8 | 6 |
| France | 13 | 19 | 4 | 13 | 5 |
| Greece | 19 | 33 | 18 | 11 | 29 |
| Poland | 26 | 34 | 16 | 19 | 10 |
| Spain | 13 | 18 | 7 | 21 | 14 |

Table 2. Infrastructure, Logistics and Sustainability Rankings for the 5 participating countries

3. Methodology

3.1. Overall Methodology

The methodology applied for the development of the present report is based on three (3) discrete phases (see Figure 1). The first phase concerns the analysis of the European e-commerce market focused mainly to the five (5) participants countries (Section 2).

The second phase of the applied methodology was based on the key findings and taking into consideration the project's objectives, the topics were decided regarding the Systematic Literature Review (SLR). By using the SCOPUS data base, the initial sample of articles was collected, developing the respective searching protocol. In order to "clear" the sample from articles not relevant or partially relevant, the PRISMA guidelines were applied. The final sample was then used as input for the third phase (clustering) of the applied methodology.

The parameters used for clustering the final sample were a) the authors' keywords and b) the indexed by SCOPUS keywords. Using K-Means methodology, those keywords were transformed into vectors to represent textual data in a numerical format that can be analyzed and grouped. By converting text into vectors, patterns were identified and similarities among the texts, effectively clustering similar documents together based on their content. Through this process, the most relevant articles were examined and included to our analysis.

By identifying core and noise points, the clustering results were used as inputs for the synthesis methodology.

The synthesis includes the following aspects:

1. Classification of Incentives across four (4) clusters (cost related; customer convenience

- & experience; loyalty & engagement and eco-friendly & sustainability);
- 2. Classification of Nudges for reducing return trips across five (5) clusters (knowledge based; emotional and psychological; convenience and process enhancement; eco-friendly & sustainability and cost related & financial);
- 3. Classification of personas based on the key findings from the literature review;
- 4. Personas journey map using the collected and analysed information, visualising the engagement patterns of various e-commerce personas across five (5) key stages.

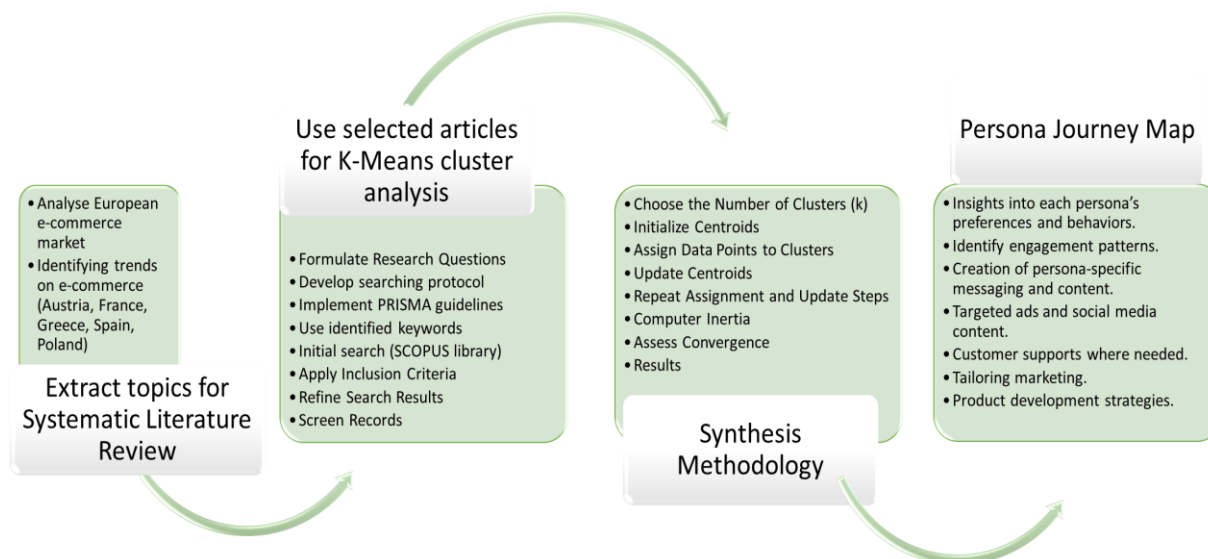


Figure 1. GreenTurn's methodology flow chart for identifying e-commerce personas

The approach visualised in Figure 1 allows to identify and understand the customer personas, to leverage K-Means clustering for segmentation and incorporate insights from the literature review to develop targeted and effective survey questionnaires. This approach ensures that the research is customer-centric, data-driven, and aligned with the project's objectives.

3.2. Systematic Literature Review Methodology

Systematic literature review is a rigorous method for identifying, evaluating, and synthesizing existing research on a particular topic, ensuring a comprehensive and unbiased collection of relevant studies. A systematic literature review is a two-step process; the first step is formulating the research question(s), and the second is following a protocol that outlines the objectives, criteria for inclusion and exclusion of the records, and methods for data extraction and analysis.

This article follows the Preferred Reporting Items for Systematic Reviews and Meta-Analysis (PRISMA) guidelines (Page et al., 2021). The PRISMA Statement and its extensions provide an evidence-based, minimum set of recommendations aimed at promoting transparent and comprehensive reporting of systematic reviews. It serves as a roadmap, guiding authors in effectively describing their methods, findings, and, for review protocols, their planned approach.

Analytically, as a first step, appropriate keywords were selected by the authors to identify records that provide answers to the research questions. The initial search terms were "e-commerce**",

“personas”, “deliver*” and “return” “*”, where “*” is a wildcard of SCOPUS database when a word has multiple spelling variations. The search yielded a total of 313 articles. The reported keywords of the captured articles are given in the word cloud of Figure 2.



Figure 2. Wordcloud produced by the keywords of the initial search

Having the initial search results as a basis, additional filters – named onwards as *inclusion criteria* – were implemented to narrow down the number of retrieved documents and refine the search process. The inclusion criteria that were set are the following:

- Records should be written in the English language
- Records should be published either as (i) articles in scientific journals, or (ii) books or (iii) chapters in a book or (iv) conference proceedings. In this way, a high-quality review process is ensured.
- Records should be contemporary; meaning being published after 2019.
- Records should be relevant to the research questions. This implies that retrieved records that belong to the following SCOPUS subject areas should be eliminated: Chemical Engineering, Biochemistry, Chemistry, Earth and Planetary Sciences, Health Professions, Immunology and Microbiology, Pharmacology, Toxicology and Pharmaceutics, Neuroscience, Nursing, Agricultural and Biological Sciences, Physics and Astronomy, Medicine.
- Records should be available and accessible online.

Integrating the filters above in our query string, a total of 139 records was finally yielded (see Table 3).

| Database | Search query | No. of records | Date of search |
|----------|--|----------------|----------------|
| Scopus | e-commerce AND persona AND (deliver* OR return) AND PUBYEAR > 2018 AND PUBYEAR < 2026 AND(LIMIT-TO(SRCTYPE , "j") OR LIMIT-TO(SRCTYPE , "p") OR LIMIT-TO(SRCTYPE , "b") OR LIMIT-TO(SRCTYPE , "k")) AND(LIMIT-TO(PUBSTAGE , "final")) AND (EXCLUDE (DOCTYPE , "sh") OR EXCLUDE (DOCTYPE , "no") OR EXCLUDE (DOCTYPE , "ed") OR EXCLUDE (DOCTYPE , "cr") OR EXCLUDE (DOCTYPE , "re")) AND (EXCLUDE (SUBJAREA , "MEDI") OR EXCLUDE (SUBJAREA , "PHYS") OR EXCLUDE (SUBJAREA , "AGRI") OR EXCLUDE (SUBJAREA , "NURS") OR EXCLUDE (SUBJAREA , "NEUR") OR EXCLUDE (SUBJAREA , "PHAR") OR EXCLUDE (SUBJAREA , "IMMU") OR EXCLUDE (SUBJAREA , "HEAL") OR EXCLUDE (SUBJAREA , "EART") OR EXCLUDE (SUBJAREA , "CHEM") OR EXCLUDE (SUBJAREA , "BIOC") OR EXCLUDE (SUBJAREA , "CENG")) AND (LIMIT-TO(LANGUAGE , "English")) AND(LIMIT-TO(OA , "all")) | 139 | 18.11.2024 |

Table 3. Query used in SCOPUS database

The 139 records were further screened to exclude those that do not address the research question or have a marginal relevance. Analytically, to perform this process we relied on the titles and abstracts of the 139 records which reduced the number of included articles to 12. Additionally, 34 articles were manually added to the sample through cross-referencing of eligible studies. The screening process can be seen in Figure 3.

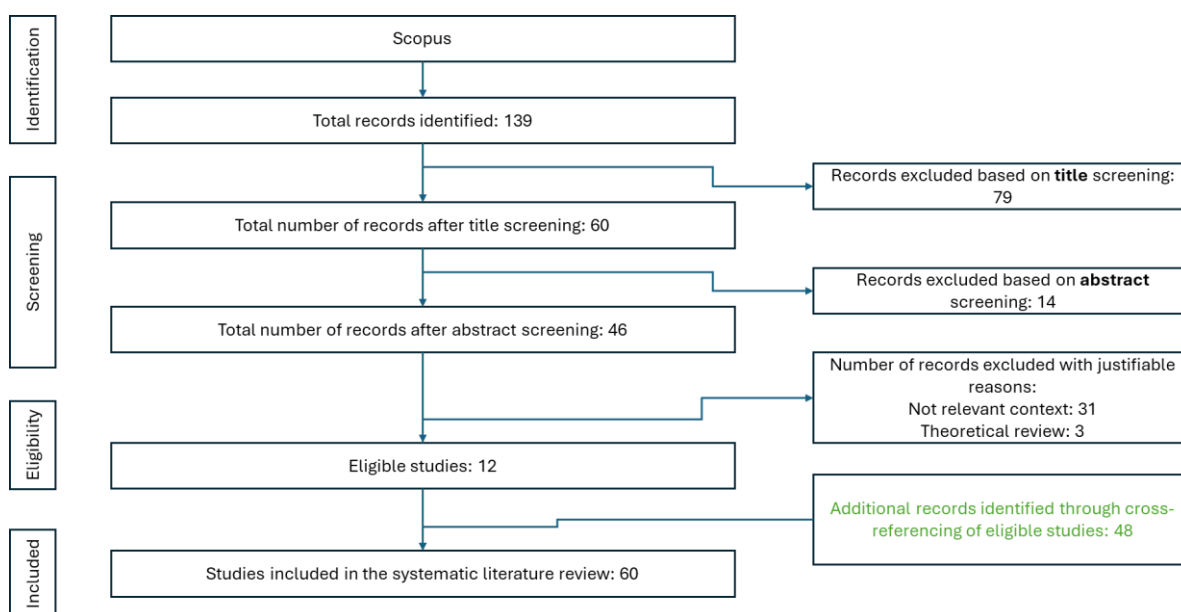


Figure 3. Data collection and screening process

3.3. Findings' Synthesis Methodology

The findings are derived from the integration of insights from the systematic literature review, persona analysis, and identified incentives developed for actionable strategies that promote sustainable behaviors in e-commerce delivery and return systems. This methodology ensures a structured approach to align consumer behaviors with incentives and nudging mechanisms and a comprehensive understanding of the interplay between personas and sustainable practices. Furthermore, this approach bridges the gap between consumer personas, their preferences, and effective strategies to encourage sustainable behaviors.

The personas recorded through the literature review were categorized based on their demographic, behavioral, and psychographic characteristics, such as cost-consciousness, eco-awareness, or a preference for convenience. Clustering techniques like K-Means were applied using parameters like authors' keywords and indexed terms to group similar personas effectively. Each persona's interaction with delivery and return services was mapped, focusing on stages such as discovery, engagement, decision-making, purchasing, and feedback, with behavioral patterns analyzed to identify preferences and barriers to adopting sustainable practices. Suitable incentives and nudging mechanisms were paired with personas, such as discounts for selecting eco-friendly delivery options, gamification strategies for sustainable choices, or loyalty points for minimal returns, and assessed for their potential to drive behavior change, with impact scores used to evaluate effectiveness.

4. Descriptive analysis of the included studies

This section provides an in-depth analysis of the selected studies, focusing on temporal trends, journal distributions, and geographical representation. The goal is to highlight key patterns in the literature and identify gaps that inform the subsequent synthesis of findings.

4.1. Temporal distribution of the publications

Figure 4 illustrates the temporal distribution of the included studies between 2019 and 2024, categorized into two key areas: (i) incentives and nudging mechanisms (represented by the orange bars), and (ii) personas with reference to corresponding behavior to delivery/return services and/or policies (depicted by the gray bars). It is important to note that while a few records address personas in relation to delivery/return behaviors or policies, most of the records focus on personas alone without explicitly linking them to these specific aspects. Both categories show a steady increase in publications over the years, reflecting a growing interest in these topics. Starting with minimal contributions in 2019, the total number of publications has risen significantly, peaking in 2023 and 2024. This trend underscores an expanding research focus on understanding consumer behavior and the role of incentives and nudging strategies in delivery and return services, particularly in recent years.

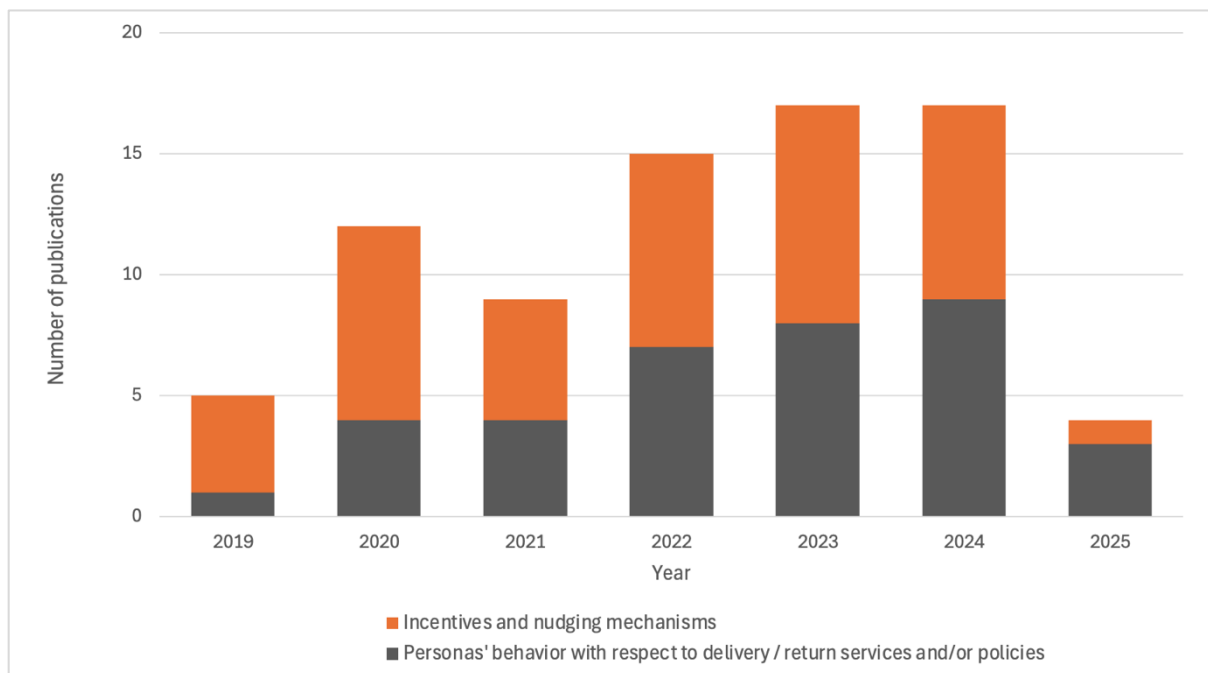


Figure 4. Publications per year

4.2. Journal distribution

Table 4 presents the key sources from which the included studies were derived, reflecting the multidisciplinary nature of research related to e-commerce personas and delivery/return services. The records span a range of fields, including logistics, transportation, human-computer interaction, and business management. Notably, journals like Sustainability (Switzerland), Expert Systems with Applications, and International Journal of Human-Computer Studies feature prominently, indicating the significance of sustainability, technology, and behavioral aspects in this research area.

Key Sources

- 2019 Sixth HCT Information Technology Trends (ITT): 1
- 5th International Congress on Human-Computer Interaction, Optimization and Robotic Applications (HORA): 1
- Blog (or websites): 4
- Case Studies on Transport Policy: 1
- Computer Science Review: 1
- Computers in Human Behavior Reports: 1
- Corporate Practices: Policies, Methodologies, and Insights in Organizational Management (Book): 1
- Digital and Social Media Marketing (Book): 1
- Digital Transformation for Fashion and Luxury Brands: Theory and Practice: 1
- Energies: 1
- Expert Systems with Applications: 2
- Gazi University Journal of Science: 1
- Heliyon: 1
- Information Systems and e-Business Management: 1
- International Journal of Hospitality Management: 1



- International Journal of Human-Computer Studies: 2
- International Journal of Physical Distribution and Logistics Management: 1
- International Journal of Retail and Distribution Management: 1
- Investigaciones Turísticas: 1
- JMIR Formative Research: 1
- Journal Européen des Systèmes Automatisés: 1
- Journal of Artificial Intelligence and Soft Computing Research: 1
- Journal of Business Research: 1
- Journal of Marketing Research: 1
- Journal of Open Innovation: Technology, Market, and Complexity: 1
- Journal of Retailing and Consumer Services: 2
- Lecture Notes in Networks and Systems: 1
- Logistics: 3
- Mathematics: 1
- Multimodal Technologies and Interaction: 1
- Regional Science Policy & Practice: 1
- Research in Transportation Business & Management: 1
- Retos: 1
- Sage Open: 1
- Sustainability (Switzerland): 3
- Systems: 1
- The Asian Journal of Shipping and Logistics: 1
- Transportation Research Interdisciplinary Perspectives: 1
- Transportation Research Part D: Transport and Environment: 1
- Transportation Research Procedia: 2
- Travel Behaviour and Society: 1
- Universal Access in the Information Society: 1
- (Conference) Transportation Research Board: 6

Table 4. Key journals in systematic literature review

4.3. Geographical distribution

Figure 5 illustrates the geographical distribution of the analyzed studies, highlighting the countries contributing to the research on e-commerce personas and delivery/return services. The United States stands out as the most prominent contributor with seven records, followed by Poland (5), Italy (4), Spain (4), and China (4). Several other countries, including Japan, Canada, Singapore, Somalia, and Germany, contribute three records each, while Georgia has two records. Additionally, nine other countries are represented with a single record. This distribution highlights a significant focus on the topic in developed economies, particularly in North America, Europe, and parts of Asia, with relatively limited contributions from other regions.

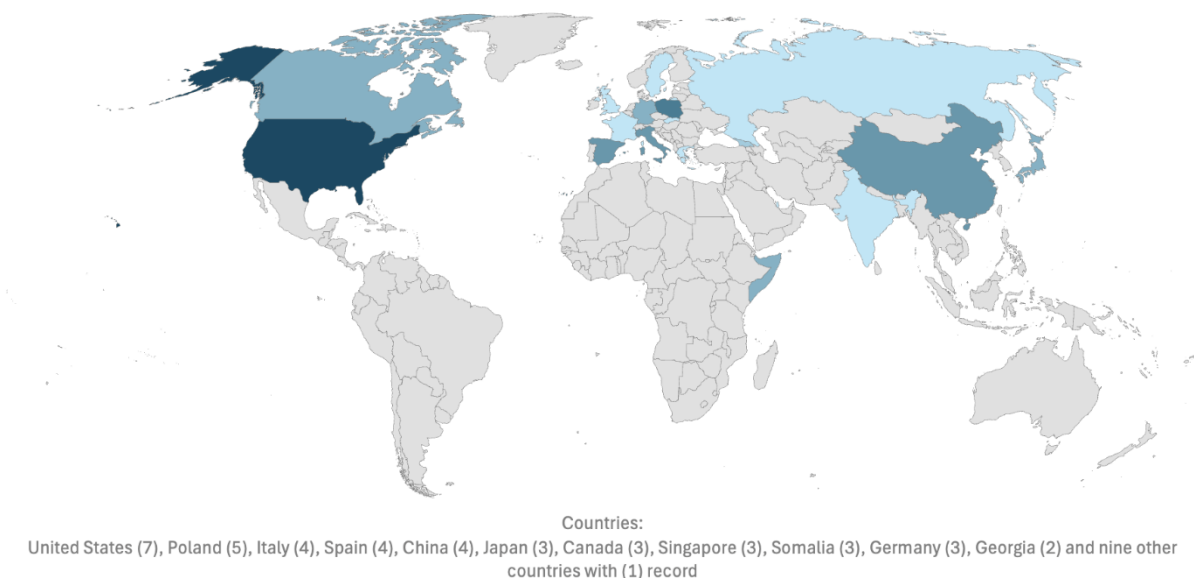


Figure 5. Geographical distribution of analysed studies by country.

5. Key findings from the included records

5.1. Identified personas and preferences

After a thorough analysis of the included articles in the systematic review, two main clusters of records emerged concerning RQ1; those that focus on specific persona formulation and clustering; and those that explore key consumer behaviors and preferences, which could influence their delivery and return service choices or policies.

Personas

Xu & Lee (2020) identified four personas based on online behavior patterns, while Miva (2024) and Ventura (2024) presented detailed persona classifications focusing on consumer motivations, engagement levels, and shopping habits. Companies like Delve.ai (2024) provided a streamlined approach with three core personas, emphasizing decision-making stages. Contentsquare (2024) introduced personas tailored to digital journey behaviors, reflecting users' browsing habits and purchasing confidence. Zhong et al. (2023) applied persona development to live-stream e-commerce platforms, categorizing consumers into clusters based on their interaction styles. Meanwhile, Romero Montero et al. (2024) used qualitative interviews to identify personas in the hospitality sector, showcasing distinct buyer profiles. Akre et al. (2019) focused on millennials' digital behaviors, highlighting personas driven by financial aspirations and consumer desires. Collectively, these studies emphasize the importance of understanding diverse personas to tailor engagement strategies, optimize user experiences, and align marketing efforts with evolving consumer behaviors. Table 5 summarizes the personas identified in a tabulated form.

| Authors | Personas identified |
|----------------------|---|
| Xu & Lee (2020) | <ul style="list-style-type: none"> – Opportunists: visit online stores to find specific shopping info and leave once obtained; – Contributors: actively engage in sharing information, write reviews, and answer questions; – Explorers: browse extensively through product info, deals, and reviews, seeking recommendations; – Followers: join online groups/communities to stay updated with trends and discussions. |
| Miva (2024) | <ul style="list-style-type: none"> – Value Hunter: hunts for best prices and deals; – Researcher: takes time to learn about products; – Brand Devotee: loyal promoter of brands; – Social Butterfly: social media influencers sharing knowledge; – Replenisher: repeat customers valuing products; – Mobile Shopper: prefers shopping on mobile devices; – Gifter: enthusiastic buyers purchasing gifts for friends and families. |
| Delve.ai (2024) | <ul style="list-style-type: none"> – Bouncers: only look and are unsure what they want; – Passive Browsers: haven't yet started shopping; – Cart Abandoners: know what they want but are undecided about the store to buy from. |
| Ventura (2024) | <ul style="list-style-type: none"> – Impulse Shopper: driven by emotions and instant gratification; – Researcher: methodical shopping approach; – Loyal Customer: values personalized experiences and loyalty rewards; – Tech-Savvy Shopper: seeks seamless online experiences and innovation; – Ethical Shopper: supports brands aligning with values; – Luxury Consumer: seeks exclusivity, quality, and superior experiences; – Practical Shopper: looks for functionality; – Gift Giver: values recommendations, packaging, and flexible return policies. |
| Contentsquare (2024) | <ul style="list-style-type: none"> – Novice: spends 46% more time browsing than average new visitors; – Demanding: avoids wasting time, spends 35% less time on pages; – Thrifty: price-conscious shoppers; – Anxious: uncertain buyers; – Carefree: confident, relaxed shoppers. |
| Zhong et al. (2023) | <ul style="list-style-type: none"> – Dedicated: enjoys searching but interacts minimally online; – Dependent: needs time to figure out processes, alerted by family to risks; – Active: ensures products are cost-effective before buying; – Lurker: prefers observing over expressing but forwards interesting findings. |
| DHL (2024) | <ul style="list-style-type: none"> – Social Media Shoppers: purchase frequently through Facebook, Instagram, TikTok with focus on exclusivity and personalization; – Sustainable Shoppers: prefer eco-friendly, transparent deliveries despite cost; |

| | |
|------------------------------|---|
| | <ul style="list-style-type: none"> – Cross-Border Shoppers: motivated by savings, unique offerings, and quality, requiring clear customs and returns. |
| Romero Montero et al. (2024) | <ul style="list-style-type: none"> – Primary: main target customer in marketing strategies; – Secondary: significant but less prioritized group; – Tertiary: relevant but less significant group; – Undesirable: customers accommodations prefer to avoid. |
| Fenton et al. (2022) | <ul style="list-style-type: none"> – Jim Smith: male, 52, avid sports fan, uses social media, motivated by health concerns and unsure about fitness app setup; – Andrea Rogers: female, 33, football club marketing professional, explores apps, VR, and eSports to engage younger audiences. |
| Akre et al. (2019) | <ul style="list-style-type: none"> – Millennial Male: saving for a house and trades in stock market but struggles financially; – Millennial Female: struggles to save for shopping but values advertisements, desires comfort and happiness. |

Table 5. Personas identified

Personas' preferences

Consumer personas exhibit distinct preferences and behaviors regarding delivery and return services, shaped by demographic, behavioral, and psychographic factors. Alguacil et al. (2020) found that women demonstrate higher trust and loyalty toward services, while younger users excel in credibility and trustworthiness (as users of sports services). Frequent users exhibit the strongest loyalty, whereas unemployed individuals prioritize trust, and retirees show the highest loyalty levels. These findings highlight that different demographic groups may favor reliable and transparent delivery processes, while loyalty-driven personas value consistency in service offerings.

The DHL (2024) report underscores additional behavioral trends, particularly among social media, sustainable, and cross-border shoppers. Social media shoppers prioritize personalized, engaging shopping experiences and exclusive products, often influenced by trends on platforms like Instagram and TikTok. Sustainable shoppers, on the other hand, prefer environmentally friendly practices, such as transparent eco-impact information and sustainable delivery methods, even if it involves higher costs. Cross-border shoppers emphasize cost savings, clear customs processes, and flexible return policies to avoid unexpected issues like basket abandonment. These preferences suggest that delivery and return services must be tailored to address key motivators such as exclusivity, sustainability, and convenience.

Further studies, such as those by Hall & Towers (2017) and Appiah & Watson (2024), highlight the role of social validation and digital interactivity in influencing consumer decisions. For instance, Millennials rely on peer validation and social networks before finalizing purchases, while modern consumers increasingly seek seamless, interactive experiences with brands throughout their digital journey. Together, these insights emphasize the importance of offering flexible, transparent, and sustainable delivery and return options to align with personas' unique expectations, enhancing overall satisfaction and loyalty.

Pasupuleti et al. (2024) highlight the values of customer segmentation in improving supply chain agility and sustainability. By categorizing customers based on purchasing behaviors and preferences, businesses can tailor their inventory management and logistic strategies more effectively. Asdecker (2021) by investigating the elements influencing consumer adoption

of innovative last mile delivery methods (parcel lockers and home delivery) identified that customer preferences are strongly influenced by perceived convenience, privacy and security concerns. Iannaccone et al. (2021) concluded through their research that accessibility, security, and ease of use have a big impact on the delivery method selection; young e-consumers presented an increasing preference for parcel lockers suggesting a shift towards alternative collection strategies in urban logistics. Sharda et al. (2025) highlighted through their research that policy makers should prioritize investments for digital literacy initiatives and internet development to guarantee fair access to online purchasing and delivery services. To fulfill the growing demand for home deliveries, the authors suggest that urban regions should concentrate on enhancing their last-mile delivery infrastructure. Rangel et al. (2025) investigated the factors influencing e-commerce behavior, focusing on adoption, purchase frequency, and returns. Using data from a survey in Madrid, Spain and a statistical modeling approach (GSEM), the study finds that mobility habits, gender, fear of COVID-19, and sociodemographic factors all play a role in shaping online shopping behavior. Castaño et al. (2025) investigated how e-commerce affects people's travel habits, using data from Madrid, Spain. The authors explored the connections between socio-demographics, mobility patterns, and online shopping behavior, with a focus on the sustainability implications of these changes. Fardin et al. (2025) examined the relationship between telework and online shopping/delivery activity in post-pandemic New York City, U.S.A. The findings suggest that telework is associated with increased online shopping and deliveries, especially for groceries, and that this relationship is influenced by factors like income, household size, and car ownership. Patwary & Khattak (2025) through their research identified how online shopping is affecting in-person shopping activities, with a specific focus on how these changes impact disadvantaged communities. de Oliveira et al. (2025) investigated how residential location, especially living in informal settlements, affects access to parcel delivery in Belo Horizonte, Brazil. The authors concluded that income, internet access, and age are important factors, and that security concerns in informal settlements create additional barriers to delivery access.

Table 6 presents the key findings of the literature review in relation to consumer characteristics and their influence on e-commerce experiences.

| Impact on Online Shopping and Delivery | | Source |
|--|---|--|
| Demographics | | |
| Age | <ul style="list-style-type: none"> Younger users prioritize credibility and trustworthiness. Young e-consumers prefer parcel lockers. | Alguacil et al. (2020); Iannaccone et al. (2021) |
| Gender | Women demonstrate higher trust and loyalty towards services. | Alguacil et al. (2020) |
| Employment Status | <ul style="list-style-type: none"> Unemployed individuals prioritize trust. Retirees show the highest loyalty levels. | Alguacil et al. (2020) |

| Psychographics | | |
|-------------------------------|--|---|
| Shopping Behavior | Frequent users exhibit the strongest loyalty. | Alguacil et al. (2020) |
| Values & Attitudes | Sustainable shoppers prioritize eco-friendly practices. | DHL (2024) |
| Socioeconomic Factors | | |
| Income | Influences online shopping and delivery activity (higher income = more online shopping). | Fardin et al. (2025) |
| Mobility | Mobility habits influence e-commerce behavior. | Rangel et al. (2025) |
| Residential Location | Access to internet and security concerns in informal settlements impact delivery access. | de Oliveira et al. (2025) |
| Technological Factors | | |
| Internet Access | Essential for online shopping and delivery. | Sharda et al. (2025); de Oliveira et al. (2025) |
| Digital Literacy | Crucial for fair access to online purchasing and delivery services. | Sharda et al. (2025) |

Table 6. Consumer characteristics and their influence on e-commerce experiences based on the literature review

5.2. Incentives and nudging mechanisms

To address Research Question 2 -what incentives and nudging mechanisms can influence e-commerce consumer personas to adopt more sustainable delivery and return options- several strategies have been identified. These measures are aimed at reducing the environmental impact of deliveries and returns while encouraging responsible consumer behavior.

Incentives for Sustainable Delivery and Return Policies

One effective approach to influencing consumer behavior is through incentives that reward sustainable choices. **Offering discounts on future purchases** can motivate customers to forgo returns altogether or opt for eco-friendly return methods (Kiba-Janiaka et al., 2024). Similarly, **free return shipping** can be provided for customers who consolidate returns or use slower, greener logistics options, reducing unnecessary emissions and costs associated with expedited shipping.

Cashback offers also encourage customers to avoid returning low-value items, thereby minimizing handling and transportation demands (Rodrigue, 2022). To reinforce long-term sustainable habits, businesses may introduce **loyalty points programs**. Extra loyalty points can be awarded to customers who minimize returns or adopt environmentally friendly methods, with points redeemable for discounts, free shipping, or special offers (Kiba-Janiaka et al., 2024). For customers already committed to sustainability, additional rewards such as **priority processing of refunds or exchanges for eco-friendly returns** can serve as tangible benefits.

Innovative incentives like **eco-friendly packaging discounts** provide rewards for customers who reuse original packaging or select recyclable materials (Hadaś et al., 2024). **Extending the return window**—for example, from 30 to 60 days—for customers choosing green options can further alleviate time pressures, promoting consolidated returns and reducing the environmental burden of rushed logistics (Rodrigue, 2022). Companies may also leverage **charity donations**, allowing customers to contribute to environmental causes when opting for more sustainable return options or deciding not to return an item.

For consumers seeking long-term convenience, subscription-based models offer value while aligning with sustainability goals. **Subscription-based return services** allow unlimited returns for a flat fee, provided customers consolidate returns or use eco-friendly shipping methods (Sułkowski et al., 2022). **Bundling returns into a single shipment** can also be encouraged by offering discounts or rewards, significantly cutting down emissions generated by multiple deliveries. **Green labeling**—highlighting products with sustainable return policies—can help customers make informed decisions while offering small incentives, such as discounts, for choosing these options (Kiba-Janiaka et al., 2024).

Figure 6 presents the incentive policies clustering based on the above-described.



Figure 6. Incentive policies clustering

Nudging Strategies for Delivery Return Policies

Beyond incentives, nudging strategies can play a critical role in promoting sustainable choices by subtly guiding consumer behavior. For instance, integrating a visible **carbon footprint calculator** into the return process allows customers to see the environmental impact of their decisions in a visual, easy-to-understand format (Bellio & Buccoliero, 2021). This transparency helps consumers better appreciate the consequences of their choices.

Nudges and incentives are complementary strategies aimed at influencing consumer behavior, but they differ in their approach and mechanisms. **Incentives typically involve tangible rewards, such as discounts, cashback, or loyalty points, to encourage specific actions.** They appeal directly to consumers' financial interests, offering clear, measurable benefits for adopting

sustainable delivery and return practices. In contrast, nudges subtly guide decision-making by leveraging behavioral psychology principles without restricting choices or offering material rewards. **Nudging strategies, such as emphasizing environmental benefits, framing eco-friendly options as the default, or using social proof, rely on influencing consumers' attitudes and perceptions to promote sustainable behavior.** While incentives provide external motivation, nudges aim to internalize the desired behavior, fostering long-term change.

Businesses can further influence behavior through **emotional appeals**, emphasizing the positive impact of eco-friendly returns on the environment and future generations (Jiang et al., 2023). Such messaging creates an emotional connection, increasing the likelihood of sustainable behavior. In addition, companies can make default **green options the standard choice in the return process**, requiring customers to actively opt-out if they prefer less sustainable alternatives. By framing **eco-friendly options** as the default, businesses nudge customers toward more responsible decisions.

Implementing a **pre-return check system** can also reduce unnecessary returns. Before initiating a return, customers can be prompted with questions about whether the return is truly necessary, offering alternatives like troubleshooting support or exchanges (Bellio & Buccoliero, 2021). Once a sustainable return is completed, providing feedback on impact can reinforce positive behavior by sharing metrics, such as, "By choosing this return method, you helped reduce carbon emissions by X amount."

To encourage informed decision-making, businesses can use information nudges, such as **presenting concise and clear details about the environmental impacts of various return methods at the point of decision.** Gamification elements, like earning **badges or levels for choosing sustainable options**, can further enhance engagement (Cauwelier et al., 2024). **Tangible rewards** for reaching milestones (e.g., discounts or exclusive offers) provide an added incentive for customers to continue adopting green practices.

Behavioral reminders are another effective tool, particularly during the return window. Sending **notifications that highlight the benefits of slower or consolidated returns** can influence customer choices. Similarly, introducing **tiered return fees**—where greener return methods incur lower or no fees, while less sustainable options come at a higher cost—can make eco-friendly options more attractive (Moroz & Polkowksi, 2016).

Lastly, businesses can leverage **social norms messaging** by showcasing how other customers are making sustainable choices. For instance, statements like "80% of our customers choose green returns" create a sense of social proof, encouraging individuals to align their behavior with the majority (Kiba-Janiak et al., 2024).

Figure 7 presents the nudging strategies clustering based on the above-described for delivery returns.

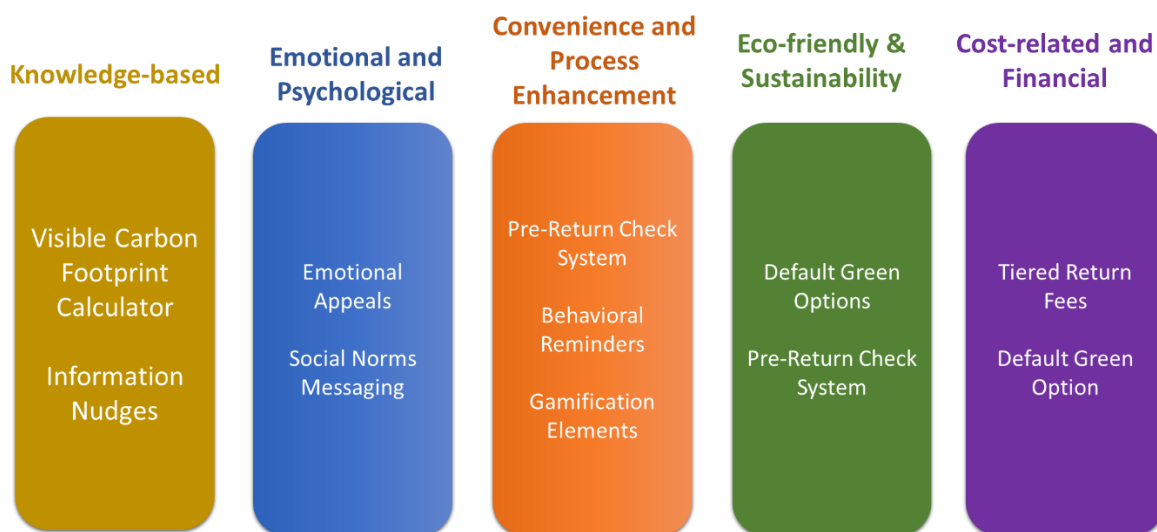


Figure 7. Nudging strategies clustering.

6. Synthesis

In this section, the results from subsections 5.1 (Identified Personas and Preferences) and 5.2 (Incentives and Nudging Mechanisms) are synthesized to formulate Persona Types and their key characteristics. The synthesis highlights how these personas can be influenced through targeted incentives and nudging mechanisms to adopt more sustainable delivery and return options.

The synthesizing process was based on the systematic review and specifically the relevant literature identified. By analysing the respective articles, key findings were identified, personas were classified, and their preferences, behaviors, and influencing factors were understood. The articles were then analyzed to extract detailed persona profiles based on demographic, psychographic, and behavioral characteristics, considering diverse frameworks such as shopping motivations, interaction styles, and online behaviors. Additionally, the analysis recorded insights into consumer preferences regarding delivery and return services, highlighting factors like trust, loyalty, sustainability, and accessibility.

Table 7 presents the synthesized persona types, their characteristics, and the corresponding incentives and nudging mechanisms designed to encourage behavioral changes toward sustainability.

| Persona Type | Key Characteristics | Incentives and Nudging Mechanisms | Impact on Personas | Return Behavior |
|----------------------------|--|---|---|---|
| Time-Savers | Prioritize convenience, value time over price, avoid physical stores. | Discounts for selecting consolidated deliveries. Eco-friendly options bundled with faster checkout processes. | Convenience-based nudges encourage adoption of grouped deliveries to save time and reduce hassle. | Prefer returns with doorstep pickup or easy drop-off points to save time. |
| Brand Seekers | Prefer trusted brands, willing to pay more for quality and reputation. | Loyalty points or rewards for purchasing eco-labeled products from reputable brands. | Brand-linked eco-incentives strengthen trust and align with values. | Return fewer items due to trust in product quality and fit from reliable brands. |
| Review Enthusiasts | Check reviews, ratings, and product authenticity before purchasing. | Recognition for contributing eco-focused reviews, eco-impact metrics during shopping. | Transparency and recognition motivate eco-conscious choices. | Likely to prefer clear, hassle-free return policies for authentic and rated products. |
| Family-Centric | Make decisions heavily influenced by family needs and values. | Discounts or bundled deals on family-oriented, sustainable products. | Family-aligned incentives promote green purchasing decisions. | Seek flexible return policies for family use items, e.g., longer return windows. |
| Health-Conscious | Focused on buying organic, sustainable, and environmentally friendly products. | Donations to health/environment causes tied to green purchases, eco-impact feedback post-purchase. | Cause-driven nudges increase alignment with personal values. | Prefer minimal packaging and reusable options to align with eco-consciousness. |
| Cultural Guardians | Value products and brands respectful of cultural traditions. | Discounts for culturally sensitive and eco-friendly products. | Culturally aligned incentives motivate purchases and green delivery options. | Require clear return processes for culturally sensitive items. |
| Tech-Savvy Shoppers | Confident with apps and e-commerce platforms, enjoy personalized, tech-enabled shopping experiences. | Gamified rewards for choosing sustainable delivery methods or consolidated orders. | Tech-driven nudges and rewards resonate with their preferences. | Appreciate app-based return options with automated tracking updates. |



| | | | | |
|-------------------------|--|--|--|--|
| Social Shoppers | Heavily influenced by social media trends and recommendations. | Visible eco-metrics on popular platforms, influencer campaigns for green products. | Social proof encourages adoption of sustainable behaviors. | Prefer transparent, influencer-endorsed return policies. |
| Cost-Conscious | Seek value through deals and discounts, focus on cost-effectiveness. | Free shipping for orders with eco-friendly packaging or consolidated delivery options. | Cost savings influence adoption of green delivery and return practices. | Prefer free returns to minimize financial risk while trying products. |
| Impulsive Buyers | Make quick, emotional decisions for instant gratification. | Carbon footprint calculators, immediate eco-reward points for sustainable delivery choices. | Emotional triggers nudge toward spontaneous eco-friendly decisions. | Expect hassle-free, quick return options to maintain shopping spontaneity. |
| Global Explorers | Shop internationally for unique items, balancing cost and exclusivity. | Clear eco-labeling for international shipping, rewards for using slower shipping methods or centralized pickup points. | Cost-efficient and transparent eco-labels motivate adoption of green shipping choices. | Require flexible and affordable return solutions for cross-border purchases. |
| Premium Shoppers | Value exclusivity, quality, and premium service experiences. | Priority service for sustainable return options, discounts on eco-friendly packaging. | Premium incentives align with their expectations of superior service. | Expect premium, hassle-free return services with packaging reuse options. |

Table 7. E-commerce personas

6.1. Persona Journey Map

The Persona Journey Map visualizes the engagement patterns of various e-commerce personas across five key stages: Discover, Engage, Decide, Purchase, and Feedback (Lemon & Verhoef, 2016). Each persona exhibits distinct behaviors, with some emphasizing specific stages more heavily than others.

The first stage, **Discover**, is where consumers initially become aware of a product, service, or e-commerce platform. This awareness can arise through various channels, such as online advertisements, social media platforms, recommendations from others, search engines, or organic browsing. Different personas display unique discovery patterns; for instance, tech-savvy individuals may rely heavily on social media and influencer endorsements, whereas others might prefer more traditional approaches, like email marketing or word-of-mouth recommendations.

The second stage, **Engage**, involves the consumer's initial interaction with the e-commerce platform or product. During this stage, consumers might browse websites or mobile apps, read product reviews, compare options, or add items to wish lists or shopping carts. Personas differ significantly in their engagement behaviors. For example, some personas are meticulous researchers who spend considerable time analyzing reviews and exploring options, while others, such as impulse buyers, may move quickly to the next stage with minimal interaction.

The third stage, **Decide**, is where consumers deliberate and make the critical choice of whether to proceed with a purchase. Several factors influence this decision-making process, including price, brand reputation, convenience, trust in the platform, and the availability of deals or discounts. Personas vary in their approach to this stage. Cost-conscious buyers might wait for sales or discount coupons to finalize their decision, whereas premium shoppers might prioritize product quality and brand reputation over price, leading to quicker decision-making.

The fourth stage, **Purchase**, marks the point at which the transaction is completed. This stage includes selecting a payment method, choosing delivery preferences, and finalizing the order. The purchase experience itself—such as the ease and user-friendliness of the checkout process—plays a significant role in shaping consumer behavior at this stage. Personas may prefer different payment options, such as mobile wallets, credit cards, or cash on delivery, and their delivery preferences may range from same-day service to eco-friendly options. Challenges during this stage, such as a complex checkout process, might lead some personas to abandon their carts altogether.

The final stage, **Feedback**, occurs post-purchase when the consumer evaluates both the product and the overall shopping experience. This can involve leaving reviews, reaching out to customer support to address any issues, or sharing their experience with others through social media or other platforms. Personas behave differently at this stage as well; for instance, those who value community and social sharing may actively post reviews or engage online, while others may only provide feedback when incentivized, such as receiving discounts for leaving a review. In some cases, feedback may only be provided when the experience was particularly positive or negative.



Time-savers show a strong preference for convenience during the purchasing process, prioritizing quick and efficient shopping experiences. They are highly engaged when discounts for consolidation deliveries and/ or eco-friendly options are offered to them. As for their parcel returning behavior, they favour hassle-free solutions like doorstep pickups or easy drop-off points.

Brand Seekers on the other hand, present a consistent commitment to trusted brands and quality products. They respond well to loyalty points and rewards for purchasing eco-labelled goods, reflecting their dedication to reputation and quality. Their parcel returning behavior is minimal due to their confidence in their reliability of the brands they choose and trust.

Enthusiasts demonstrate high engagement during the research and feedback stages as they heavily rely on reviews, ratings, and product authenticity. They are motivated by recognition for contributing eco-focused reviews and prefer clear, hassle-free return policies for products that meet their standards.

Family-Centric shoppers make decisions based on family needs and values, presenting strong activity in stages where discounts or bundled deals on sustainable products are offered. Their parcel returning behavior is driven by rather more flexible policies, such as longer return windows.

Health-Conscious consumers maintain steady engagement across all shopping stages, emphasizing their focus on purchasing organic, sustainable, and environmentally friendly products. They can be influenced by donations to health or environmental causes tied to their purchases and they most likely prefer minimal packaging and reusable options in relation to parcel returns.

Cultural Guardians present a balanced approach, valuing products and brands that respect cultural traditions. They usually respond positively to discounts for culturally sensitive and eco-friendly purchases and they require clear and transparent return processes for these products.

Tech-Savvy Shoppers present high engagement with tech-enabled shopping experiences and personalized rewards. They are motivated by gamified rewards for choosing sustainable methods and they appreciate apps-based return options with automated tracking updates.

Social Shoppers can be highly influenced by social media trends and recommendations, and also remain engaged through visible eco-metric and influencer campaigns for green products. They most likely prefer transparent, influencer-endorsed return policies.

Cost-Conscious consumers present strong activity during Discover and Decide stages, seeking value through deals and discounts. They can be influenced by free shipping offers for eco-friendly packaging or consolidated deliveries and they usually prefer free returns to minimize financial risk.

Impulsive Buyers can make quick, emotional decisions, showing high engagement when immediate eco-reward points or carbon footprint calculators are available. They expect hassle-free, quick return options to maintain their spontaneous shopping habits.

Global Explorers prefer to balance cost and exclusivity in their international shopping experiences, presenting consistent engagement when clear eco-labelling and rewards for slower

shipping methods are offered. They will probably require flexible and affordable return policies for cross-border options.

Finally, **Premium Shoppers** present high engagement during the Purchase stage, focusing on exclusivity and quality. They are motivated by priority service for sustainable return options and discounts on eco-friendly packaging, expecting premium, hassle-free return services with packaging reuse options.

By translating complex consumer data into detailed, actionable personas, e-commerce companies gain strategic insights necessary to align their marketing initiatives, product offerings, and customer experiences with the unique needs and behaviors of diverse audience segments. This tailored approach allows brands to create highly personalized and resonant interactions, fostering deeper brand loyalty, higher conversion rates, and a stronger competitive edge in today's dynamic digital marketplace.

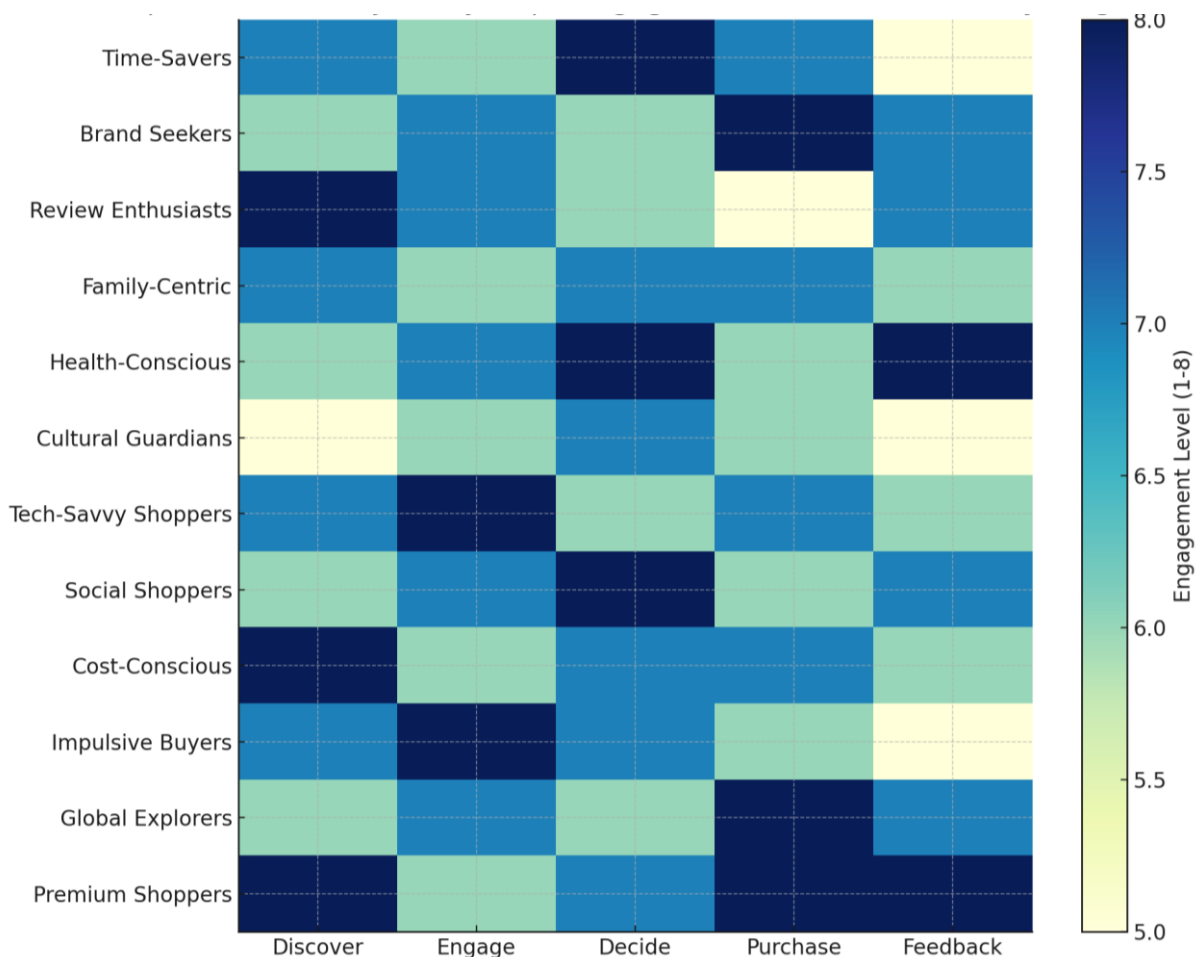


Figure 8. Persona journey map - Engagement patterns across key stages

Figure 8 can provide useful insights into each persona's preferences and behaviors to by identifying their engagement patterns and the areas where certain personas are disengaged. Furthermore, the information presented can guide the creation of persona-specific messaging and content creating targeted ads and social media content.



Also, the customer journey can be customized for each persona based on the persona's engagement level at each stage, providing customer support for each persona where most needed.

7. Conclusions

This deliverable provides a comprehensive exploration of the intersection between e-commerce personas and delivery/return behaviors, emphasizing the critical role of tailored incentives and nudging mechanisms in fostering sustainable consumer choices. By synthesizing findings from a systematic literature review, diverse persona types and their unique characteristics have been identified, along with actionable strategies to influence their decision-making. The insights presented underscore the importance of segmenting consumers based on nuanced behavioral and psychographic factors, enabling e-commerce platforms to implement targeted interventions that improve operational efficiency, enhance customer satisfaction, and support environmental sustainability.

The personas proposed in this deliverable are an initial framework derived from the existing literature and will undergo further validation as the project progresses. Validation will occur through data collected in Task 2.3 (Behavioral Modeling), which includes a questionnaire designed to capture real-world behaviors and preferences. Additional validation will be achieved through Task 2.2, which involves direct engagement with consumers and retailers to develop a deeper understanding of their needs, preferences, and barriers concerning sustainable delivery and return options. This dual approach ensures that the personas evolve from theoretical constructs into practical tools, ultimately guiding effective and scalable strategies for behavioral change in last-mile logistics.



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Annexes

Annex A: List of records (n=53) that were included in the systematic literature review.

| No. | Title | Authors | Year | Database |
|-----|---|--|------|----------|
| 1 | A review on customer segmentation methods for personalized customer targeting in e-commerce use cases | Alves Gomes M.; Meisen T. | 2023 | Scopus |
| 2 | Circular Supply Chain Network Design for E-commerce | Kocaoglu B.; Bulut M. | 2024 | |
| 3 | Development of a Partial Shipping Fees Pricing Model to Influence Consumers' Purchase Intention under the COVID-19 Pandemic | Tsai C.-A.; Chang C.-W. | 2022 | |
| 4 | Implementing E-Commerce from Logistic Perspective: Literature Review and Methodological Framework | Zennaro I.; Finco S.; Calzavara M.; Persona A. | 2022 | |
| 5 | Last Mile Logistics Innovations in the Courier-Express-Parcel Sector Due to the COVID-19 Pandemic | Sułkowski Ł.; Kolasińska-Morawska K.; Brzozowska M.; Morawski P.; Schroeder T. | 2022 | |
| 6 | Mapping the Research Landscape of Reverse Logistics in E-Commerce: A Bibliometric | Bellio E.; Buccoliero L. | 2021 | |



| No. | Title | Authors | Year | Database |
|-----|---|--|------|------------------------|
| | Analysis from 2003 to 2023 | | | |
| 7 | Persona Perception Scale: Development and Exploratory Validation of an Instrument for Evaluating Individuals' Perceptions of Personas | Klumpp M.; Loske D. | 2021 | |
| 8 | Reducing retail supply chain costs of product returns using digital product fitting | Dol A.; van Strien T.; Velthuijsen H.; van Gemert-Pijnen L.; Bode C. | 2023 | |
| 9 | The Criteria of Inbound Marketing to Segment and Explain the Domain Authority of the Cellars' E-Commerce in the Canary Islands | Díaz-Meneses G.; Amador-Marrero M.; Spinelli Guedes C. | 2023 | |
| 10 | The Factors Influencing User Satisfaction in Last-Mile Delivery: The Structural Equation Modeling Approach | Vrhovac V.; Dakić D.; Milisavljević S.; Ćelić Đ.; Stefanović D.; Janković M. | 2024 | |
| 11 | The impact of COVID-19 on logistics and coping strategies: A literature review | Li Z.; Gu W.; Meng Q. | 2023 | |
| 12 | The Role of Packaging in Sustainable Omnichannel Returns—The Perspective of Young Consumers in Poland | Hadaś, Ł., Domański, R., Wojciechowski, H., Majewski, A., Lewandowicz, J | 2024 | |
| 13 | A novel time series clustering method with fine-tuned support vector | Abbasimehr, H. & Bahgery, F.S. | 2022 | Extended SCOPUS search |



| No. | Title | Authors | Year | Database |
|-----|---|---|------|----------|
| | regression for customer behavior analysis | | | |
| 14 | An Algorithm-based approach for Mapping customer journeys by identifying customer browsing behaviors on E-commerce Clickstream data | Chen S.-S., Li T.-L., Wu Y.-C., Singh V. | 2023 | |
| 15 | An Approach Based on Data Mining and Genetic Algorithm to Optimizing Time Series Clustering for Efficient Segmentation of Customer Behavior | Hamidi, H. & Haghi, B. | 2024 | |
| 16 | An investigation of consumer intention to use pick-up point services for last-mile distribution in a developing country | Neto, L.G., Vieira, J.G.V. | 2023 | |
| 17 | Creating and validating predictive personas for target marketing | Hsu, P.F., Lu, Y.H., Chen, S.C., Pei-Yi Kuo, P. | 2024 | |
| 18 | Determinants of consumer intention to use smart food lockers during COVID-19: A multi-method approach. | Hu, Y., Chen, Y., Zhou, S., Yang, S., Jiang, H., Ma, Y. | 2024 | |
| 19 | Determinants of customer satisfaction with parcel locker services in last-mile logistics. | Lai, P.L., Jang, H., Fang, M., Peng, K. | 2022 | |



| No. | Title | Authors | Year | Database |
|-----|---|---|------|----------|
| 20 | Discovering patterns and trends in customer service technologies patents using large language model | Kim, C. & Lee, J. | 2024 | |
| 21 | Does delivery service differentiation matter? Comparing rural to urban e-consumer satisfaction and retention | Vakulenko, Y., Arsenovic, J., Hellstrom, D., Shams, P. | 2022 | |
| 22 | Drivers and Barriers for Sustainable Last-Mile Delivery Based on E-customers' Preferences: Examples from Poland and Brazil. | Kiba-Janiakb, M., Cheba, K., de Oliveira, L.K., van Duin, R. | 2024 | |
| 23 | Exploring the factors that drive consumers to use contactless delivery services in the context of the continued COVID-19 pandemic | Jiang, Y., Lai, P.L., Yang, C.C., Wang, X. | 2023 | |
| 24 | Home-based parcel deliveries: Consumer and logistics patterns from retail digitalization. | Rodrigue, J.P. | 2022 | |
| 25 | How to design a sustainable last-mile delivery and returns business model from E-Customers' expectations perspective? | Kiba-Janiaka, M., Cheba, K., Mucowaska, M., de Oliveira, L.K., Piecyk, M., Evangelista, P., Prockl, G., Rzesny-Cieplinska, J. | 2024 | |
| 26 | Improving real estate CRM user | Ferreira, M.S., Antao, J., Pereira, R., Bianchi, A.S., Tavma, N., Shurenov, N. | 2023 | |



| No. | Title | Authors | Year | Database |
|-----------|---|---|------|----------|
| | experience and satisfaction: A user-centered design approach | | | |
| 27 | Investigating senders' switching intention to smart lockers: An extension of push-pull-mooring model | Chen, L., Wu, P., Dou, Y., Wu, Y. | 2024 | |
| 28 | Multiple criteria decision support system for customer segmentation using a sorting outranking method | Barrera, F., Segura, M., Maroto, C. | 2024 | |
| 29 | Parcel self-collection for urban last-mile deliveries: A review and research agenda with a dual operations-consumer perspective | Ma, B., Wong, Y.D., Teo, C.C. | 2022 | |
| 30 | Systematic review on privacy categorisation | Inverardi, P., Migliarini, P., Palmiero, M. | 2023 | |
| 31 | The Last Mile Issue and Urban Logistics: Choosing Parcel Machines in the Context of the Ecological Attitudes of the Y Generation Consumers Purchasing Online. | Moroz, M. & Polkowksi, Z. | 2016 | |
| 32 | From cart to door: Unravelling consumer behaviour through attitudinal sustainability profiles. | Cauwelier, K., Buldeo Rai, H., Puttemans, K., Macharis, C., Mommens, K. | 2024 | |



| No. | Title | Authors | Year | Database |
|-----|--|---|------|----------|
| 33 | Accelerating User Profiling In E-Commerce Using Conditional Gan Networks For Synthetic Data Generation | Gabryel, M., Kocic, E., Kocic, M., Patora-Wysocka, Z., Min., X., Miroslaw, P. | 2024 | |
| 34 | The Importance of Social Networks for E-commerce: An Analysis of Young Users' Perspectives in the European Union | Fedorko, R., Bačík, R., Rigelský, M., Horváth, J., Král, S. | 2024 | |
| 35 | Who is interested in a crowdsourced last mile? A segmentation of attitudinal profiles. | Rai, H.B., Verlinde S., Macharis, C. | 2021 | |
| 36 | Smart Digital Marketing of Financial Services to Millennial Generation using emerging technological tools and buyer personas | Akre, V., Rajan, A., Ahamed, J., Al Amri, A., Al Daishi, S. | 2019 | |
| 37 | Sociodemographic analysis of brand perception in a public sports service: From target to person buyer | Alguacil, M., Crespo-Hervás, J., Pérez-Campos, C. | 2020 | |
| 38 | Smartphones and digital customers' journey | Appiah, D. & Watson, A. | 2024 | |
| 39 | Understanding your buyer persona | Cruz, A. & Karatzas, S. | 2020 | |
| 40 | Online shopper personas for e-commerce stores. | Delve.ai. (n.d.). | 2024 | |
| 41 | Beyond the basket: 2024 | DHL eCommerce | 2024 | |



| No. | Title | Authors | Year | Database |
|-----|---|---|------|----------|
| | online shopper trends | | | |
| 42 | How to Use the Six-Step Digital Ethnography Framework to Develop Buyer Personas: The Case of Fan Fit. | Fenton, A., Heinze, A., Osborne, M., Ahmed, W. | 2022 | |
| 43 | Understanding how Millennial shoppers decide what to buy: Digitally connected unseen journeys | Hall, A. & Towers, N. | 2017 | |
| 44 | 7 types of ecommerce consumer personas and how to influence them | Miva Blog | 2024 | |
| 45 | Do you know your Buyer Persona? Identify your customer to improve your Inbound Marketing strategy | Romero Montero, A., Sellers Rubio, R., Cely Alvarez, A.M. | 2024 | |
| 46 | Review of Social Media Marketing on Digital Savvy Brand Shoppers | Samadi, S. & Akhtar, I. | 2023 | |
| 47 | Common buyer personas in e-commerce | Ventura Web Design. (n.d.). | 2024 | |
| 48 | Identifying Personas in Online Shopping Communities | Xu, Y., & Lee, M. | 2020 | |
| 49 | Developing personas for live streaming commerce platforms with user survey data | Zhong, R., Han, S., Wang, Z. | 2024 | |
| 50 | Customer Value and Value for Customer Retails | Lax, A., Mau, N. | 2013 | |



| No. | Title | Authors | Year | Database |
|-----|--|--|------|----------|
| | Sectors' Need for Transformation | | | |
| 51 | Building the E-Commerce Supply Chain of the Future: What Influences Consumer Acceptance of Alternative Places of Delivery on the Last-Mile | Asdecker, B. | 2021 | |
| 52 | What Young E-Consumers Want? Forecasting Parcel Lockers Choice in Rome | Iannaccone, G., Marcucci, E., Gatta, V. | 2021 | |
| 53 | Enhancing Supply Chain Agility and Sustainability through Machine Learning: Optimization Techniques for Logistics and Inventory Management | Pasupuleti, V., Thuraka, B., Kodete, C.S., Malisetty, S. | 2024 | |
| 54 | New Norms or Old Habits: Evaluating Interlinked Trajectories of Online Shopping and Work Commute Post-Pandemic | Sharda, S., Alonso, P., Garikapati, V., Laguarda, I., Goulias, K., & Viz, N. | 2025 | |
| 55 | Analyzing E-Commerce Last-Mile: Key Variables in Adoption, Frequency, and Returns | Rangel, T., Gomes, J., Alves, G., & Vassallo, J. M. | 2025 | |
| 56 | Connecting E-Purchases and Mobility: How Does E-Commerce Impact People's Mobility Habits? | Castaño, D., Gomes, J., Garrido, L., Tapiador, L., & Vassallo, J. M. | 2025 | |
| 57 | How Does Telework | Fardin, F.R., Le Morvan-Chevestre, M., Conway, A. | 2025 | |



| No. | Title | Authors | Year | Database |
|-----|---|--|------|----------|
| | Influence Online Shopping and Home Delivery Activity? Findings from Post-Pandemic New York City | | | |
| 58 | Interaction Between the Emerging Components of Online Shopping and In-Person Activities: Insights from Behavioral Survey and the Justice40 Initiative | Patwary A.L. & Khattak, A. | 2025 | |
| 59 | Analyzing the Parcel Delivery Pattern in the Global South: The Case of the Brazilian Favelas | de Oliveira, L. K., Colaco, R., Araújo, G. G. F. & de Abreu e Silva, J. | 2025 | |
| 60 | Personas: A Guide to Understanding Your Customers | Countersquare (https://go.contentsquare.com/hubfs/PERSONAS-EN-Booklet-INT.pdf) | 2024 | |