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Value creation in parcel delivery: A systematic literature review and research agenda

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ABSTRACT

The rapid growth of e-commerce and urbanization has resulted in a significant increase in the demand for parcel delivery services. Consequently, firms must satisfy stakeholder demands while simultaneously maintaining operational efficiency and sustainability. This study examines value creation within the parcel delivery process by systematically reviewing 138 peer reviewed articles published between 2015 and August 2025 using PRISMA framework. The analysis identifies six core value criteria (economies of scale, learning economies, innovation capabilities, management capabilities, social and environmental aspects) and maps them across the stages of parcel delivery process. Findings highlight significant knowledge gaps in areas such as cargo security, customer decision-making, delivery personnel well-being, and environmental concerns. It calls for sustainable, innovative, and eco-friendly solutions, emphasizing emerging technologies including artificial intelligence, machine learning, digital twin, and the Internet of Things. By integrating these criteria into a structured framework, the study offers actionable insights for designing parcel delivery strategies that are operationally efficient, environmentally responsible, and socially beneficial.

1. Introduction

Parcel delivery, or last mile delivery, involves transporting finished goods to the final customer [44,229]. The service flourished in the mid-1990s with the introduction of the internet and the transition from in-person to online shopping [174]. Academic research has increasingly focused on the effects of online shopping on resources, delivery network configurations, and operational decision-making processes in parcel delivery [44,93]. A report by Bledose [20], published on the official website of the International Trade Administration, indicates that global e-commerce sales have consistently increased over the past decade, with projections suggesting that Business-to-Consumer (B2C) e-commerce revenues could reach $5.5 trillion by 2027. This reflects a compound annual growth rate (CAGR) of 14.4 %, with dominant sectors including fashion, furniture, and electronics. Consequently, the demand for sustainable parcel delivery solutions has never been greater. The COVID-19 pandemic has further intensified this demand and increased pressure on parcel delivery systems [132]. Urbanization and rising environmental pressures require parcel delivery firms to optimize time, reduce congestion, improve parking efficiency, and lower labor costs while meeting sustainability goals [41,175]. For example, W. Kim & Wang [93] propose freight demand management as a strategy to mitigate parking violations, pollution, and traffic congestion resulting from the growth of e-commerce. With a growing focus on environmental sustainability, scholars are also utilizing smart autonomous technologies such as drones, delivery robots, alternative fuel vehicles, and parcel lockers to reduce greenhouse gas (GHG) emissions and environmental effects [49,74,143,192,238]. Studies in green logistics have also highlighted the effectiveness of these technologies in route optimization, energy efficiency, and minimizing environmental impact [56,74,84,135, 214].

Effective management of business processes, particularly in cross-functional domains, is essential for organizational performance and sustainability objectives [206]. According to Straková & Kostiuk [193], optimizing parcel delivery across core and supporting processes, such as loading/unloading, sorting, routing, and scheduling, improves both operational efficiency and sustainability performance. Leading businesses like FedEx, UPS, DHL, and TNT Express have invested in these process improvements to simultaneously achieve environmental, cost-cutting, and customer satisfaction objectives [23,43,60,130]. By implementing network mode optimization technology, for example, DHL tested real-life data from January 2018 to January 2019 and

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successfully reduced network costs, enhanced delivery prediction times, increased profits by 15 %, attracted new clients, and supported environmentally friendly logistics practices [43].

Several studies have identified gaps in the parcel delivery literature, including crowdsourcing [69,128], consumer behavior [128], sustainability [5,48,90], and innovative delivery solutions (see e.g., [89,128]). Mangiaracina et al. [128] highlight the importance of mapping customer behavior and leveraging crowdsourcing logistics to develop innovative parcel delivery solutions. Akdoğan & Özceylan [3] identified potential for reducing delivery costs and environmental impacts through parcel lockers and pickup points but noted a lack of data-driven research. To support drone delivery promises, Kellermann et al. [89] recommended empirical research and scientific proof. According to Buldeo Rai & Dablanc [27], future research needs a shared data agenda. To bridge the gap between academia and industry, Premkumar et al. [165] also recommended real-time data research. These studies suggest the need for deeper research on urban logistics, customer expectations, societal benefits, and innovative package delivery strategies. Although Modica et al. [138] conducted a systematic literature review on logistics 4.0 application to create value in freight transportation, no comprehensive literature evaluation has been conducted from a value creation perspective focusing on parcel delivery process.

Huemer & Wang [77] discussed the value creation from a resource-based perspective, arguing that resources possess no inherent value in isolation. Instead, their value arises through purposeful bundling and interaction with other resources, where resource interfaces and imprints shape the value creation process. As a result, value is generated beyond firm boundaries, encompassing not just profit generation but also benefits related to knowledge, reputation, safety, health, and environment. These benefits may be produced for, or co-created with, diverse stakeholders to achieve competitive advantage. While Waktola et al. [211] characterize value creation as the strategic alignment of company objectives with social responsibility through the incorporation of stakeholder requirements into strategic decision-making. The proactive engagement of stakeholders enables organizations to develop trust and loyalty, which contributes to performance improvement and market differentiation. Zhu et al. [247] describe stakeholders as those who impact the company's strategy and objectives. It includes internal stakeholders, including owners, managers, and employees, as well as external stakeholders, such as government entities, subsidy providers, customers, and communities. Value creation is a dynamic process that involves both the creation and destruction of value, influenced by stakeholder engagement and decisions [207]. In logistics, it involves creating a competitive advantage through cost-cutting, enhancing service quality, and increasing operational efficiency through strategies like asset flexibility, process standardization, and market segment specialization [134]. Offering unique value alongside core services differentiates businesses and enhance their competitiveness [215]. Identifying and addressing customer requirements enhance consumer acceptance of the service, leading to a dual perspective of value creation for logistic companies and customers [104]. Achieving equilibrium between internal processes and customer satisfaction enhances value creation within the organization [115]. Value creation in logistics is increasingly linked to sustainability principles, highlighting the allocation of resources to tackle economic, environmental, and societal challenges, which include health and safety protocols, emissions reduction, and environmental accountability [47].

Schilling & Seuring [181] defined sustainable value creation in the supply chain by employing consistent economic, environmental, and social criteria. The economic aspects are assessed through sustainability expenditure, profitability, competitiveness, long-term viability, spending, and community-wide revenue distribution. Conversely, energy consumption, material usage, land utilization, waste management, water management, GHG emissions, and supplier assessments collectively impact the environmental dimension (EN). The social dimension (SO) encompasses human rights, community development, health and safety, education and training, and consumer concerns. In another study, Melacini et al. [134] developed a framework based on a thorough analysis of existing literature and interviews with four third-party logistics (3PL) companies. The framework encompasses four factors: economies of scale (ES), learning economies (LE), innovation capabilities (IC), and management capabilities (MC). Although the framework is focusing on 3PLs, it is sharing the same concept with parcel delivery. Economies of scale are characterized by cost savings, infrastructure sharing, and process standardization. Banaszewska et al. [15] explained that parcel delivery depot efficiency is influenced by internal factors, including labor and outsourced operations, as well as external factors such as demographics and geographical considerations. These elements are crucial for identifying cost-saving opportunities while preserving service quality through operational and strategic improvements, such as redesigning networks and refining improvement initiatives. Although Cruijssen et al. [42] demonstrated that horizontal collaboration among parcel delivery companies can enhance profitability and service quality, its adoption remains limited. Bartucz et al. [16] further highlight systematic barriers to cooperation in the CEP market, including strong competitive positions, managerial cognitive biases, legal/antitrust concerns, and risk perceptions, which limit the realization of jointly-created economic and sustainability value.

The process of change and collaboration with external parties to adjust to new technologies is known as innovation capability. Mitrsomwang & Chaikidurajai [137] discussed the factors influencing parcel delivery firms' digital transformation. Technologies like real-time tracking, automated routing, and data analytics are crucial for improving performance, particularly when it comes to reducing delivery delays, increasing consumer transparency, and enabling predictive logistics. The second aspect is strategic agility and adaptability, as parcel delivery companies are moving from a static distribution structure to a network that is dynamic and driven by demand. The impact of corporate culture, which included management commitments, innovation culture, and staff readiness, came next. The final component is customer-centric innovation, which uses artificial intelligence (AI) integration to improve user interface, offer individualized delivery alternatives, and expedite support to offer fast adaptation and responsiveness to the customer needs. The ability to adapt to new innovations gives the business a competitive edge through improved resource allocation, customer satisfaction, and streamlined processes.

Pitelis & Runde [161] reframed the interaction among innovation capability, learning economies, managerial capabilities, economies of scale, and overall economic determinants within a post-classical economic paradigm that highlights dynamic and capability-driven development. Innovation capability is depicted as a fundamental catalyst for economic development and linked to learning processes that improve absorptive capacity and adaptive potential which is also supported by Ratanavanich & Charoensukmongkol [168] and Ziegler [248]. Learning economies emphasizes the progressive accumulation of knowledge, which drives innovation and facilitates strategic decision-making. Management capabilities are crucial for coordinating resources and connecting organizational issues with innovation and learning objectives. Economies of scale are redefined not only as economic benefits but also as facilitators of skill enhancement, particularly when used with proficient management and organizational learning. These components work together to create a framework where innovation capabilities, learning economies, management capabilities, and economics of scale interact to provide economic resilience and growth [161].

The logistics value creation architecture includes factors related to operational strategies that address the economic dimension, while the social and environmental dimensions remain inadequately addressed in logistics. Therefore, we adapted a framework from Melacini et al. [134] and Schilling & Seuring [181] to cover all sustainability value creation aspects. Table 1 demonstrates the reflection of the value creation lens within the framework derived from Melacini et al. [134] and Schilling & Seuring [181]. The table synthesizes the principal mechanisms through

Table 1
Value creation (VC) in parcel delivery; adapted from Melacini et al. [134] and Schilling & Seuring [181].

Criterion	Mechanism	Sustainability			Value creation
		Economic	Environmental	Social	
EN – Environmental dimension	Energy, emissions, waste, land/water management; environmental supplier assessment.	◦	●	◦	Lower ecological footprint, regulatory compliance, reduced risks, improved local environmental quality.
SO – Social dimension	Worker rights, safety, community welfare, consumer fairness, education & training, community development	◦	◦	●	Improved labor conditions, safer operations, community acceptance, higher trust and legitimacy.
ES – Economies of scale	Consolidation, density, infrastructure sharing, resource utilization, standardized processes.	●	◦	◦	Lower cost per parcel, higher productivity, reduced empty miles, efficient asset utilization.
LE – Learning economies	Operational learning, process refinement, error reduction, continuous improvement.	●	◦	◦	More reliable operations, fewer mistakes, higher service quality, safer work practices.
IC – Innovation capabilities	Routing optimization, electrification, automation, digital interfaces.	●	●	●	Cost efficiency, emissions reduction, enhanced customer experience, workforce skill upgrading.
MC – Management capabilities	Coordination of material, capacity, information flows, demand balancing, network design.	●	◦	●	Higher service reliability, reduced congestion, fewer failed deliveries, optimized capacity usage.

which parcel delivery systems generate sustainability outcomes and value creation. Each criterion (environmental, social, economies of scale, learning economies, innovation capabilities, and management capabilities) is mapped to its corresponding mechanisms, highlighting the primary sustainability dimension addressed (economic, environmental, and social) and specific forms of value creation achieved. This structured representation clarifies how operational practices, technological innovations, and managerial (capabilities and flows) collectively contribute to sustainable logistics.

This paper addresses three primary research questions: RQ1: What gaps exist in the current literature on parcel delivery process, and which areas necessitate further investigation to address these gaps and expand understanding in the field? RQ2: What are the key factors influencing value creation in parcel delivery process? RQ3: How do economic, environmental, and social criteria influence sustainable value creation in parcel delivery process? Through a systematic literature review addressing each research question, we can identify and assess the critical elements and characteristics affecting the parcel delivery process, explore the diverse methodologies and technologies utilized in this domain, and analyze the existing and prospective challenges. We also investigate how technology, such as tracking systems and last mile delivery options, can improve the parcel delivery. The following sections are organized as follows. Section 2 covers the scope of parcel delivery process that is covered in this paper. Followed by Section 3 which covers the review methodology, while Section 4 contains the review results. Research agenda in Section 5 reflects the future research of parcel delivery process. And finally, Section 6 presents our conclusion.

2. The definition of parcel delivery process

All logistical activities, from order posting and continuing through shipping and distribution to the point when the customer receives the package, are collectively referred to as the parcel delivery process [23]. Another term utilized in parcel delivery is "last mile delivery," which refers to the final segment of the delivery process that transfer the item from the last distribution point to the end user [44,101,139]. The parcel delivery process begins with order placement and ends when the recipient chooses home delivery or collection. Customers typically place purchase orders specifying products and delivery locations, after which the company prepares, packs, and hands the parcel to the carrier. Individuals may also send parcels directly through a delivery company via its website or call center, or by dropping items at offices or pick-up points. Once an order is posted, data for pickup and delivery are synchronized, an agent collects and inspects the item, and it is transported to a depot. At depots, hubs, and warehouses, parcels are scanned, sorted, and assigned to scheduled routes. Agents then deliver the items, recording successful deliveries or reasons for failure. Undelivered parcels are checked against service-level agreements and either returned or rescheduled. Efficient operations require careful planning of districting, capacity, network design, and daily trips, while continuous scanning ensures accurate tracking information for customers. The basic delivery process is reflected in Fig. 1 aligning each process with value creation criteria. Where the physical items flow (represented by solid lines) and information flow (represented by dotted lines) is reflected in the diagram.

The sender, as the customer, is a stakeholder influencing the order placement process, whether as an individual or an e-commerce entity. The board of directors, managers, and employees are the stakeholders involved in the process from order pickup to delivery, where the recipient, as the customer, dictates the timing and place of the delivery. External stakeholders, such as government and policymakers, influence decisions on item packaging by considering factors like congestion, fines, speed limits, vehicle types, health and safety policies, and parking availability.

3. Review methodology

This research examines the parcel delivery process. It aims to identify significant research in this field and identify gaps and future research opportunities using PRISMA (Preferred Reporting Items of Systematic Review and Meta Analysis) [116]. PRISMA, with its continual refinement to overcome its weaknesses and well-described check list, enables researchers in numerous domains to conduct rigorous systematic literature reviews and meta-analyses [142,153,154]. In this study, peer-reviewed articles on the parcel delivery process were retrieved and reviewed following PRISMA guidelines.

3.1. Eligibility criteria and source of information

We included the articles that meet the following criteria: i) articles that focus on parcel delivery process, last mile delivery, value creation or any part of its process; ii) articles published in last ten years starting from January 2015 to August 2025; iii) articles that are published in peer reviewed academic journals; iv) articles published on the field of engineering, social science, business, management and accounting, computer science, environmental science, energy, decision science, economics, econometrics, and finance; v) English-language articles; and vi) with full text available. The exclusion criteria were as follows: i) conference papers, book chapters, reviews, short papers, notes, books, and erratum; and ii) articles outside logistics-related disciplines. The data source retrieved from three databases: Scopus, Emerald Insight, and EBSCO. Scopus offers extensive multidisciplinary access and comprehensive citation tracking, making it optimal for spotting significant research in logistics, technology, and consumer behavior. Emerald Insight provides expertise in logistics and supply chain management, offering access to both conceptual and empirical research essential for

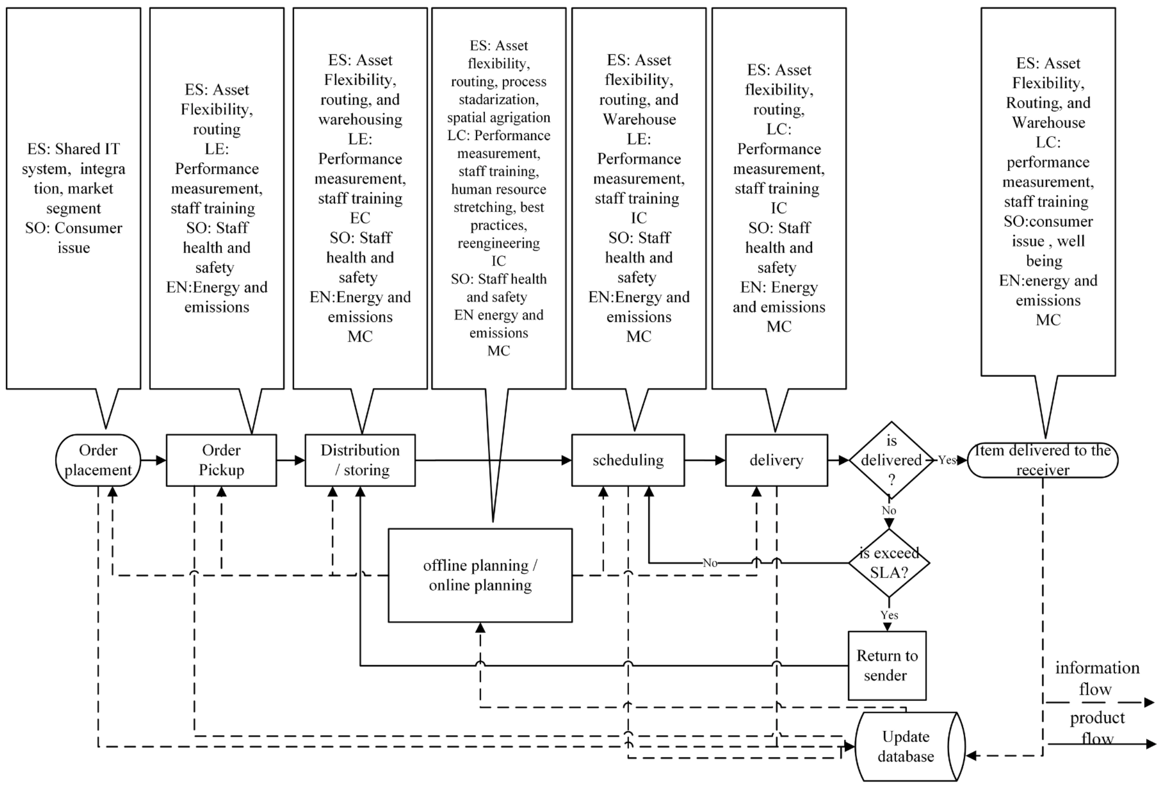

Fig. 1. An illustration of the parcel delivery process.

understanding business model innovation and stakeholder interactions. Business Source Ultimate (EBSCO) enhances these resources by integrating academic and practitioner-focused content, providing international insights on customer satisfaction, self-service technologies, and last mile delivery techniques. This triangulated approach reduces publication bias, supports multidisciplinary synthesis, and follows established systematic review standards, ensuring coverage of both theoretical and practical aspects of value creation in parcel delivery.

3.2. Search strategy

The search utilizes the terms “parcel delivery” OR “last mile delivery” AND “value creation” AND “process”. The use of keywords in conjunction with Boolean operators served to narrow the search, emphasizing the process perspective. The search query was conducted across the title, abstract, and keywords fields on last ten years publication. Consequently, the retrieved articles encompass all papers published from 2015 up to August 2025, with the earliest article matching our search published in 2016.

3.3. Selection process

A total of 1066 articles were identified through the search strategy employed. Prior to screening, 928 articles are excluded due to ineligibility. Table 2 reflects the number of papers excluded while applying the eligibility criteria mentioned in Section 3.2. The initial screening is performed; four articles are excluded due to duplication between databases. The full text screening process excluded a total of 32 articles, including those addressing topics such as technical aspects of Drones (eight papers), the broader supply chain ecosystem (five papers), food delivery (five papers), big data and digitalization (four papers), customer service perspective (three papers), knowledge management (two papers), hotel industry (one paper), banking services (one paper), construction logistics (one paper), robot manufacturing (one paper), and electricity distribution (one paper) where parcel delivery is used as example and no value creation contribution in the article. There is no automation involved in the selecting process; it is carried out manually by the authors. Fig. 2 summarizes the PRISMA flowchart for the selection process.

Table 2
Number of papers after applying the eligibility criteria.

Search keywords and eligibility criteria applied	Number of papers Included	Number of papers excluded
“parcel delivery” OR “last mile delivery” AND “value creation” AND “process”	1066	
Ten years period (Jan 2015 to Aug 2025)	641	425
Peer reviewed journals	244	397
English language	237	7
Articles only	188	49
Full text available	174	14
No duplication	170	4
Relevant to research field in full text screening process	138	32
Total number of papers	138	928

3.4. Descriptive analysis (outcomes)

A summary of 138 articles on the parcel delivery process has been compiled by categorizing the papers based on annual publication frequency and methods design. Fig. 3 illustrates the annual frequency of publications during the study period from 2015 to Augst 2025. The data indicates an increasing trend from 2016 to 2024, while 11 papers published until August 2025. The increasing trend in publication volume highlights the growing academic and practical significance of value creation in parcel delivery that reflects increasing scholarly engagement, expanding theoretical frameworks, and increasing relevance to contemporary issues. In terms of methodological design, most studies employed quantitative approaches, particularly computational experiments and survey-based analyses, indicating a strong preference for

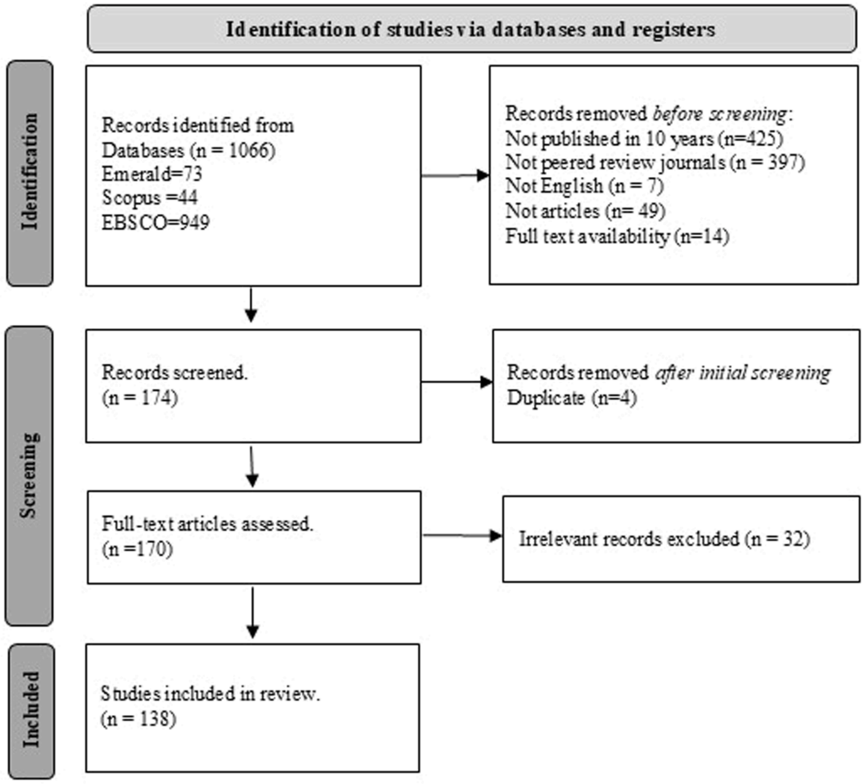

Fig. 2. PRISMA 2020 flow diagram for a new systematic review including database searches.

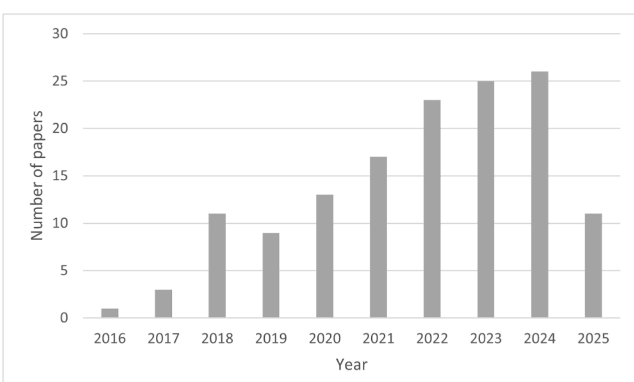

Fig. 3. Publications by year.

data-driven and replicable research. However, the presence of mixed methods and qualitative studies signals a growing recognition of the need for contextual depth and stakeholder-centric insights. This methodological diversity highlights the evolving complexity of parcel delivery research and importance of integrating both empirical rigor and human-centric perspectives.

3.5. Synthesis methods and thematic analysis

Thematic analysis is conducted using VOS Viewer. The keywords are represented as a circles with differing levels of connectivity, calculated through normalization analysis to create clusters. Distinct colors denote each cluster; the diameter of the circle corresponds to the frequency of occurrence in the data [82]. The examined publications are uploaded as a RIS file to the VOS Viewer software to construct a bibliometric network that revealed semantic clusters and co-occurrence relationships among keywords. A total of 56 out of 465 keywords were evaluated and identified as meeting the threshold of having a frequency greater than five. By clustering related keywords into distinct thematic groups, Fig. 4 enables the identification and mapping of concepts aligned with six key criteria of value creation. This visualization facilitates a structured interpretation of the literature, revealing both dominant research areas and cross-dimensional linkages such as the interplay between cost optimization, stakeholder engagement, technological innovation, and sustainability. These keyword clusters were used to guide initial coding, aligning terms with six value creation criteria as shown in Table 3. Each cluster was then examined for conceptual mechanisms, process relevance, and strategic implications, forming the basis for thematic categorization. The articles were grouped into sets based on recurring value creation logics. Table 4 in the Appendix is reflecting each value creation criteria with related articles.

4. Findings

Expanding upon the thematic clusters and value creation criteria identified through keyword and bibliometric analysis in previous section, this section explores the empirical and conceptual findings reported across the literatures on parcel delivery process. This analysis maps the operational realities and strategic innovations to six core value creation dimensions. Aiming to answer research questions, the goal is to uncover how these dimensions reflected in practice, which mechanisms are most frequently emphasized, and where gaps or emerging opportunities exist.

4.1. Order placement

Value creation in the order placement process reflects a convergence of economies of scale, learning economies, innovation, management, social, and environmental dimensions. Economies of scale are achieved through the integration of diverse delivery formats such as attended home delivery, click-and-collect, and self-pickup points which allow

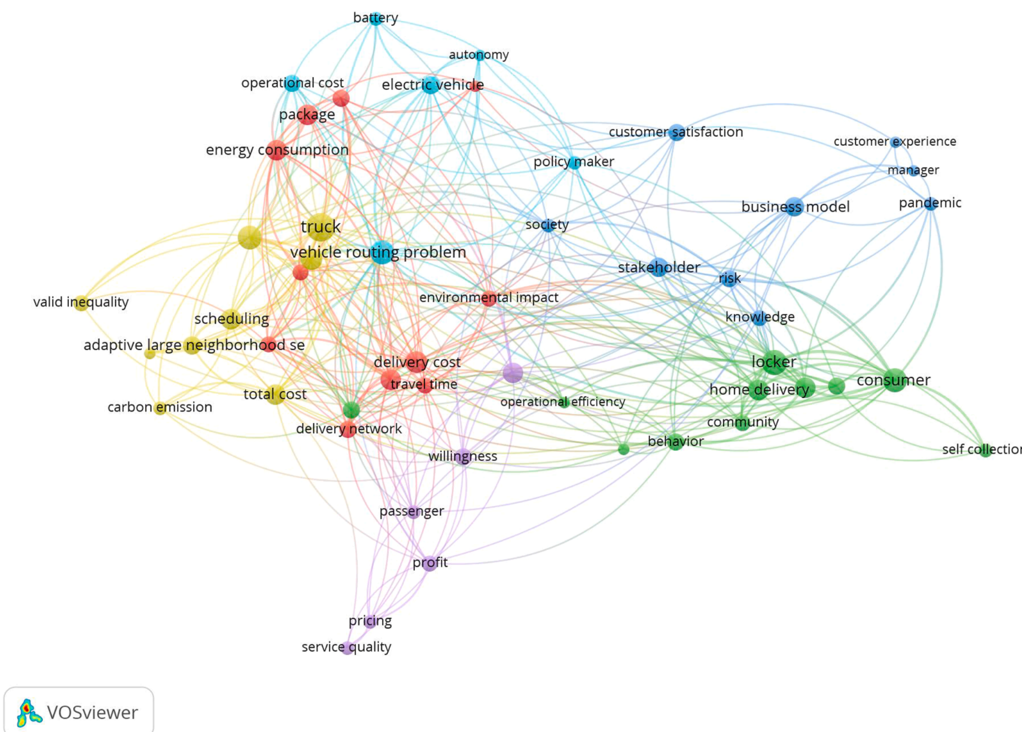

Fig. 4. Keywords analysis.

firms to serve varied customer needs efficiently across geographic and temporal constraints [129]. Learning economies emerge from slot-based delivery and differentiated pricing strategies, which, though underutilized, offer potential for balancing capacity and refining service responsiveness [73,120]. Innovation capabilities are reinforced by technologies like blockchain and omnichannel platforms that enhance transparency and traceability, enabling personalized and trust-based logistics configurations [146]. W. Kim & Wang [94] add that behavioral modeling of alternative delivery location (ADL) adoption supports infrastructure planning, reinforcing learning economies and innovation capabilities. Management capabilities are strengthened through digital infrastructure and omnichannel coordination, allowing firms to dynamically allocate resources and improve planning accuracy [129]. Moreover, Martin et al. [130] emphasize the strategic importance of offering differentiated delivery time options to segment customers by speed and price sensitivity. This enables tailored service offerings that enhance revenue and satisfaction. Social value is created as consumers become active participants in logistics engaging in self-collection, reverse logistics, and community-based delivery which aligns logistics with individual lifestyles and fosters inclusion [219]. Hagen & Scheel-Kopeinig [70] further highlight the role of customer-driven micro depots (CMDs) in bundling deliveries, reducing direct-to-consumer trips, and aligning ecological efficiency with urban suitability. Environmental value is supported by participatory models and flexible formats that reduce redundant travel and emissions, while digital tools and traceability systems enable eco-conscious decision--making [146].

4.2. Order pickup

Value creation in the order pickup process reflects a multidimensional interplay of economies of scale, learning economies, innovation capabilities, management capabilities, social value, and environmental value. Economies of scale are achieved through the deployment of automated parcel stations (APS), mobile lockers, and hybrid models that offer flexible, contactless, and time-saving retrieval options, enhancing operational efficiency and customer convenience across diverse urban contexts [33,83,100,152,170,183]. Learning economies emerge as consumer attitudes toward these technologies shaped by perceived usefulness, ease of use, and emotional responses inform adoption strategies and system refinement, with psychological comfort and autonomy acting as key behavioral levers [79,212,217,245]. Innovation capabilities are reinforced by blockchain technologies that enhance transparency and traceability, indirectly boosting trust in unattended and self-service pickup formats [146]. Management capabilities are reflected in omnichannel strategies that integrate click-and-collect, self pickup points, and in-store collection, allowing consumers to align pickup formats with their preferences and schedules while enabling firms to optimize resource allocation [129]. Social value is generated through participatory logistics, as individuals engage in self-collection, reverse logistics, and communal recycling transforming pickup into a co-creative and inclusive experience [219]. Lyu & Teo [126] demonstrate that decentralized locker networks enhance accessibility and reduce delivery failures, while predictive models based on real usage data improve planning accuracy. Environmental value is supported by spatially distributed infrastructure and community-based models that reduce redundant travel and promote sustainable last mile practices. However, disparities in access such as those between gated communities and underserved areas highlight the need for equitable urban space allocation that reflects consumer behavior and resource distribution [98,117]. Together, these mechanisms demonstrate that effective pickup systems must balance technological agility, spatial equity, emotional assurance, and consumer empowerment to deliver meaningful and multidimensional value.

4.3. Distribution and sorting

Value creation in parcel distribution and sorting is shaped by a multidimensional convergence of automation, network design, infrastructure integration, and collaborative logistics. Economies of scale are achieved through automated sorting systems particularly closed-loop conveyor configurations that streamline parcel flow, consolidate

Table 3
Alignment of keywords with value creation criteria.

Value creation criteria	Keywords	Articles focus on the followings
Economies of scale	Delivery cost, delivery network, delivery route, depot, truck, heterogeneous fleet, total cost, service quality	Operational efficiency & network design: Cost reduction through volume aggregation, route consolidation, and fleet optimization.
Learning economies	Algorithms, routing, scheduling, valid inequality, manager, knowledge, vehicle routing problem	Algorithmic optimization & managerial learning: Iterative improvement through experience, data-driven decision-making, and algorithmic refinement, learning-based value creation.
Innovation capabilities	Crowdsourced delivery, unmanned aerial vehicle (drones), autonomy, electric vehicle, battery, optimization	Technological & model innovation: Signal disruptive technologies and novel delivery models that reshape logistics capabilities and unlock new value streams.
Management capabilities	Decision maker, policy maker, stakeholder, risk, complexity, operational cost, business model	Strategic governance & risk management: Reflect the ability to coordinate, adapt, and manage complex systems under uncertainty, resilient and scalable logistics management.
Social aspect	Consumer, community, society, behavior, preference, willingness, retailer, passenger, customer satisfaction, home delivery, locker, self-collection	Consumer-centric & community-driven models: Emphasize inclusivity, accessibility, and responsiveness to societal needs, stakeholder engagement and service equity.
Environmental aspect	GHG emissions, energy consumption, environmental impact, cargo bikes, electric vehicle, negative externality	Sustainable mobility & impact reduction: Relate to ecological outcomes, low-emission transport, and mitigation of environmental harm.

shipments into full truckloads, and reduce the need for excess vehicles, thereby lowering holding costs and improving throughput [34,35,70,93,108]. High-volume environments benefit from optimized container utilization and truck scheduling, supported by metaheuristics algorithms that enhance layout efficiency and reduce resource waste [57]. Learning economies emerge as automation introduces organizational tension but also fosters alignment and continuous improvement when managed effectively [65]. Innovation capabilities are reflected in hyperconnected hub-and-spoke networks that replace centralized sorting with flexible micro-hubs, enabling parcels to flow through shortest and edge-disjoint paths [102,151]. These networks support agile operations, reduce facility costs, and enable parcel consolidation techniques such as gunnysacking [1,11,26,103,228]. Management capabilities are strengthened through joint delivery alliances, which consolidate urban deliveries across providers, reduce unit costs, and enable coordinated fleet management via shared depots and integrated technologies [241]. Social value is indirectly supported through improved service responsiveness and reduced delivery delays, enhancing customer satisfaction and accessibility [17,61,130,209]. Environmental value is created by reducing truck volumes, congestion, and GHG emissions, while integrating high-speed rail and air freight into long-haul transport supports sustainable infrastructure planning and intercity efficiency [221,236]. Collectively, these strategies reflect a holistic and resilient approach to parcel distribution balancing speed, scalability, sustainability, and operational excellence.

4.4. Planning

Value creation in parcel delivery planning is shaped by a multi-dimensional framework that balances efficiency, sustainability, resilience, and customer-centricity across six key dimensions. Economies of scale are achieved through hybrid fleet systems that combine traditional vehicles with green technologies [158], and through strategic outsourcing mechanisms such as pre-auction optimization, which allow carriers to bid on profitable customers and consolidate low-margin deliveries [9]. Modular service architectures [163] and subterranean networks like the integrated underground logistics system (IULS) further reduce surface congestion and support scalable infrastructure planning [75]. Forecasting parcel pick-up point (PUP) loads enhances resource allocation in dense urban networks [147], while optimization models proposed by Raviv [170] and Martin et al. [130] co-align delivery time windows, pricing strategies, and resource allocation. These models outperform traditional approaches by integrating consumer preferences into operational design, enhancing strategic responsiveness and innovation capabilities. Learning economies emerge from predictive GPS models and semantic labeling that shift planning from reactive to anticipatory, improving scheduling and reducing failed deliveries [164], while complaint analytics and ESG-aligned planning enable targeted interventions based on behavioral feedback [39]. Innovation capabilities are reflected in drone-based routing models using mathematical optimization and intermediate points for low-density throughput [105,125,233], as well as simulation-based frameworks that support multi-objective ESG optimization [18]. Dynamic discretization algorithms and autonomous vehicle platooning strategies enable synchronized operations and high-resolution scheduling [180]. Management capabilities are strengthened through territory-based planning, two-stage rolling horizon methods, and Monte Carlo DSS tools that evaluate mixed-fleet policies for strategic alignment [13,113]. Organizational tension that created due to shifting from manual to automated operations or centralized to local priorities can disrupt planning, but when constructively managed, it fosters agility and alignment across distribution centers [65]. Social value is created through inclusive planning in underserved urban areas, where informal power structures, inconspicuous vehicles, and secure drop-off points enhance feasibility and equity [53]. Community logistics strategies and actor-sphere-resource-value frameworks empower informal consumer labor and participatory logistics, aligning infrastructure with satisfaction and inclusion [108,219]. Environmental value is supported by multimodal approaches such as inland waterways paired with electric cargo bikes that reduce emissions and congestion [81], while contactless delivery and smart locker systems consolidate orders and minimize urban externalities [30,195]. Köster et al. [99] contribute environmental value through anticipatory routing based on traffic management system data, allowing logistics providers to avoid emission-critical zones and improve delivery reliability. Together, these planning innovations reflect a holistic and adaptive approach to parcel logistics, integrating strategic foresight with operational excellence.

4.5. Scheduling

Value creation in parcel delivery scheduling is shaped by a strategic mix of route optimization, fleet responsiveness, behavioral modeling, territorial planning, and customer-centric design. Economies of scale are achieved through territorial scheduling models that use machine learning clustering and vehicle routing to group customers into service zones, enabling efficient parcel flow and reducing congestion and fuel consumption [45,166,246]. These zonal strategies support scalable fleet deployment and minimize redundant travel. Learning economies emerge from behavioral modeling techniques, which align delivery timing with recipient behavior to reduce failed deliveries and improve service reliability [209,224]. These insights allow planners to refine scheduling strategies based on real-time feedback and historical patterns. Innovation capabilities are reflected in the en route transloading model, which enables mid-route parcel transfers at customer locations, enhancing fleet capacity utilization and responsiveness for urgent or late-arriving orders [41]. Vrhovac et al. [210] identify key predictors of customer satisfaction which inform scheduling strategies that prioritize functional and interpersonal service attributes. These findings support social and operational value creation by aligning delivery timing with consumer expectations. Martinez-Sykora et al. [131] introduce a two-echelon model combining driving and walking, which reduces traffic disruption and fuel use. The proposed exact algorithm enhances scheduling, contributes to management capabilities and environmental sustainability. Advanced routing algorithms also solve complex vehicle routing problems under varied constraints, reducing travel time, labor hours, and balancing driver workloads [8,19,63,225]. Management capabilities are strengthened by integrating customer-selected time windows into scheduling, allowing firms to personalize routes and improve delivery precision [73,120]. This alignment between operational planning and customer expectations improve trust and responsiveness. Social value is created by empowering customers to influence delivery timing, fostering autonomy and satisfaction. Behavioral alignment also supports loyalty and reduces friction in last mile interactions [120,209,217]. Environmental value is supported by territorial clustering and optimized routing [45,87]. Together, these scheduling innovations co-create a logistics ecosystem that balances operational efficiency, sustainability, and customer-centricity.

4.6. Delivery

Value creation in delivery process is shaped by workforce stability, labor flexibility, and infrastructure coordination. Front-line delivery workers play a critical role in maintaining operational resilience [208]. Martinez-Sykora et al. [131] reveal that walking can account for up to 98 % of delivery time in dense urban areas, minimizing vehicle mileage and emissions. However, low wages and limited safety awareness limit their ability to manage risks effectively. Addressing these gaps through legal and digital mechanisms enhances transparency and governance, reinforcing the sector’s resilience [140]. Hybrid and seasonal driver-helper models improve labor flexibility, route efficiency, and cost optimization [112,123], but their success depends heavily on urban infrastructure. Parking constraints in dense cities increase stress and delay deliveries [78], while innovations such as cognitive digital twins and commercial parking bays support smarter logistics planning and green routing [122,205].

Fleet diversification and routing optimization further reinforce delivery value by balancing cost, sustainability, and service quality. Heterogeneous fleets enable tailored strategies that reduce emissions and improve load efficiency [241], while mathematical models combine electric vehicles with flexible delivery windows to minimize failed deliveries and fuel costs [176]. Hybrid fleets with range-extended electric vehicles offer dual-mode efficiency and up to 17 % energy savings [194], and light electric freight vehicles such as e-bikes and e-trikes demonstrate over 50 % cost reduction and 95 % emissions reduction in urban contexts [51]. Terrain-sensitive deployment [190] and smart charging schedules [150] further enhance ESG alignment. Complementing these strategies, sustainable technologies and inclusive delivery models improve air quality and reduce transport emissions [97,133]. Electric vans outperform diesel and drones in urban areas, while drones offer flexibility in rural zones [95].

Beyond logistics execution, workers contribute emotional and experiential value through customer interaction, enriching organizational learning and societal well-being [72]. Customer experience, shaped by reliability, emotional assurance, and relational trust, is a key driver of perceived value [30], with flexibility and trust in service quality (e.g., self-pickup options) becoming increasingly important [79]. X. Wang et al. [220] and Wang et al. [217] emphasize that emotional and cognitive experiences (e.g., enjoyment, assurance, and autonomy) are critical to consumer engagement in self-service delivery. Parcel lockers and automated stations enhance convenience and emotional engagement [119,207], with emotional motivators often outweighing functional utility [220]. Tracking actions timed near delivery completion enhance perceived service quality via the “peak-end rule” [24], and optimized timing using customer availability profiles improves success rates and cost efficiency [61]. In e-commerce, satisfaction is shaped by delivery communication, convenience, reception experience, and speed with transparency, flexibility, and post-purchase support driving loyalty [88]. Parcel lockers outperform drones and postal delivery services when home delivery is insecure, and add-on services like instant delivery or signature confirmation align with willingness to pay [136]. Environmental value is added through electric and hybrid vans, though uptake depends on policy incentives and retailer collaboration [29]. Retailers can influence sustainable choices through financial and non-financial incentives, though trade-offs exist between sustainability and perceived service value [98]. Complaint analytics help identify service failures and prioritize improvements, reinforcing both perceived and actual value [39].

Technological innovation and consumer participation also play a growing role in shaping delivery value. Consumers increasingly act as co-creators of value, engaging in crowd logistics, self-collection, and reverse logistics across formal, community, and household spheres [218, 219]. By integrating fluid-particle decomposition with auctions, delivery tasks are efficiently matched with crowdsourced drivers, reducing computing complexity, taking driver preferences into account, and enabling socially optimal job allocation in real-time inside dynamic urban logistics networks [2]. Crowd logistics creates multifaceted value across six dimensions by leveraging existing mobility resources and decentralized participation. Economies of scale are achieved by reducing infrastructure and fleet costs through the use of neighbors, ad hoc drivers, and private vehicles [4,10,114], while collaborative frameworks involving taxis, ride-hailing, and public transport expand delivery capacity without proportional investment [156,232]. Rapid deployment in high-demand urban areas is supported by low-capital models [243], with flexible coverage and demand responsiveness further enabled by platform-based coordination [38,69]. Learning economies emerge through adaptive algorithms (e.g., reinforcement learning, rolling horizon frameworks, and continuous-variable control) that refine routing and scheduling based on real-time data [10,87,107], while auction models and sensitivity analyses provide behavioral insights for strategic refinement [226,243]. Innovation capabilities are reflected in bilevel pricing optimization, green delivery algorithms, and stochastic network design [114,149,156], with CSaaS platforms and asset-light formats enabling multimodal experimentation [227,239]. Management capabilities are strengthened through platform governance, courier profiling, and incentive alignment [17,28,69], supported by game-theoretic and behavioral frameworks for mode selection and service design [199,242]. Social value is created through inclusion and micro-entrepreneurship, with community-based models, auction transparency, and flexible participation fostering trust and engagement [4, 62,69,86,226]. Polydoropoulou et al. [162] caution that while emerging technologies like autonomous vans and drones offer novelty, consumer receptivity remains tied to reliability and cost-effectiveness, suggesting that value creation must be actively cultivated through awareness and trust-building. Environmental value is delivered by minimizing redundant travel and emissions through ad hoc carriers, public transport integration, and green routing [10,114,199,232], with energy-aware planning and spatial optimization enhancing sustainability [243]. Strategic design mitigates trade-offs and aligns crowd logistics with broader ESG goals [38,69].

Drone delivery systems, also called UAV, generate multidimensional value across economies of scale, learning, innovation, management, social inclusion, and environmental sustainability. They extend service coverage to remote, rural, and congested urban areas without proportional infrastructure expansion [85,233]. Optimized truck–drone coordination and hybrid models enhance scalability during peak demand [21,46,67,118,169,222–234,240]. Luo et al. [125] demonstrate that drones with higher payload and battery capacities reduce costs and improve reliability. Learning economies are supported by adaptive algorithms, sensitivity analyses, and dynamic decision support systems that refine routing and scheduling under uncertainty [14,31,55,76,187]. Innovation capabilities emerge through novel system architectures such as intermediate launch points [105], partial differential equations (PDE)-based traffic models [186,187], and multi-layered optimization frameworks for synchronized truck–drone operations [21,179,223]. Management capabilities are enhanced by strategic planning tools, fulfillment center optimization, and regulatory modeling that align resources with demand and mitigate operational risks [25,54,118,145]. Social value is created by improving access to underserved communities and ensuring service continuity under restrictive conditions, with cooperative frameworks and automation boosting reliability and trust [76,105,145,179]. Environmentally, UAVs offer lower emissions per parcel-kilometer compared to traditional vehicles, with strategic design and cooperative planning reducing congestion and aligning drone logistics with ESG goals [31,55,186,187,222].

Hybrid delivery systems that integrate autonomous mobile robots (AMRs), autonomous delivery robots (ADRs), and drones with trucks or vans generate value across six dimensions by offering scalable, adaptive, and sustainable solutions for last-mile logistics. Economies of scale are achieved as trucks act as mobile depots for AMRs [188], vans extend ADR coverage in dense urban areas [32], and en route drone launch and recovery reduce idle time and support large-scale delivery networks [202]. Learning economies emerge through advanced algorithms such as metaheuristics algorithms for van–robot coordination [32], and deep learning–based clustering for route initialization [202]. Innovation capabilities are reflected in dynamic robot deployment systems [188], and mathematical models for drone–truck coordination [202]. Management capabilities are strengthened through strategic resource allocation, synchronization of multi-agent fleets, and long-term fleet sizing strategies [32,188,202]. Social value is created by improving accessibility in constrained urban environments, and enabling decentralized dispatch [32,188,202]. Environmental value is delivered through reduced energy consumption, congestion avoidance, and optimized routing [188,202].

Ride-sourcing and dual-use transport models generate multifaceted value in parcel delivery by using existing passenger mobility infrastructure to scale operations without proportional investment in dedicated fleets. Y. Liu & Li [120] demonstrate how integrating parcel delivery into ride-sourcing platforms during idle passenger time reduces operational costs and enhances vehicle utilization, while R. Cheng et al. [37] extend this with a dual-use system where demand-responsive buses and drones transport both passengers and parcels, minimizing redundancy and supporting scalable urban logistics. These models benefit from learning economies through adaptive algorithms and sensitivity analyses that optimize drone endurance, intermediate stops, and delay penalties [37], alongside differentiated pricing strategies that align delivery modes with customer tolerance for delays [120]. Innovation is reflected in flexible, on-demand delivery architectures and rooftop drone deployment, enabling automated last-mile service and multimodal logistics adaptability [37,120]. Management capabilities are strengthened through strategic coordination, dynamic scheduling, and advanced optimization techniques to manage routing complexity [37,120]. Social value is created by expanding access and personalization without compromising responsiveness, while reducing congestion and enhancing urban livability [37,120]. Environmentally, these models reduce GHG emissions and vehicle counts by utilizing underused travel capacity and integrating passenger–parcel transport, aligning logistics with broader sustainability goals [37,120].

5. Research agenda

The literature analysis explores the value creation model within parcel delivery and identifies critical points in process stages that needs deeper investigation. The following serves a critical function in translating the systematic literature review into a forward-looking research agenda. It offers a structured and process stage specific roadmap for future research in parcel delivery value creation. Drawing from thematic synthesis and bibliometric analysis of parcel delivery literature, it identifies underexplored areas, stakeholder dynamics, and emerging delivery models that warrant deeper investigation.

5.1. Order placement

This initial stage relies heavily on IT innovation capabilities to enable value creation. LSPs must work with e-commerce systems to arrange distribution before receiving products [191,203]. Cloud computing and AI offer significant potential to streamline this coordination [109]. Economies of scale can be achieved through scalable infrastructure models such as micro-hubs and hybrid helper systems that reduce per-unit costs and increase throughput [123,183]. Innovation capabilities such as sender system integration, advanced algorithms, autonomous delivery technologies, and digital twins, are reshaping planning and execution [188,202].

5.2. Order pickup

Driven by the growth of online shopping, this stage increasingly involves reverse logistics and consumer returns. Service point lockers offer cost-effective solutions through economies of scale [106]. Further research is needed to evaluate their environmental and financial implications across global contexts. Learning economies emerge through adaptive scheduling and behavioral feedback loops, where real-time data from customer interactions inform continuous refinement [24,122]. Social value creation can be enhanced through self-service options and emotionally reassuring interfaces that build trust [30,217].

5.3. Distribution and sorting

This stage requires a structured approach to manage fragmented, small-sized orders in distribution centers [92,151,231]. Optimizing cutoff times and strategically grouping orders; improves throughput, reduce idle time and align resource utilization with fluctuating demand that reflects the management capability dimension of value creation [109]. Evaluations of consolidation facilities should incorporate social and environmental dimensions [7,151]. The architectural design of distribution networks, including satellite placement and consolidation hubs, affects operational efficiency [40,68,112]. AI-driven vehicle routing using deep reinforcement learning and advanced neural networks has shown promise [235]. While emission reducing strategies such as congestion-aware routing and sustainable infrastructure placement are essential for environmental value creation [51,190].

5.4. Planning

In planning process, managers should consider various last mile delivery alternatives to reduce congestion due to rising e-commerce demand [204,231]. In densely populated regions, LSPs should work together, but advanced methods should be used to predict demand more accurately [113,204]. Outsourcing delivery with incentives that match company strategies is another option [113,178]. Future studies should focus on developing systems that can forecast consumer real-time location, the category of new clients, and readiness to accept delivery by occasional couriers [52]. Research on the best way to divide up costs and profits to develop evolutionary stable methods for last mile delivery resource integration is necessary [244]. Moreover, it is necessary to test the impact of market density on package delivery operations' ability to reduce terminal costs [96]. There has been much research on two-tiered network designs and their effects on delivery efficiency, but more research is required to determine how adding more distribution centers/spokes can improve operational processes [196,231]. Lastly, the tracking process is another area of study that needs further enhancement and testing. GPS and handheld devices are used to monitor deliveries and collections, increasing productivity and worker effort. Further research is required to evaluate the integration of emerging technologies such as the IoT and RFID to deliver real-time information to the shipper, receiver, and logistics providers [44,59]. Implementing low-cost real-time tracking systems is challenging when many independent carriers are involved in the delivery process [44].

5.5. Delivery

This stage demands research into drivers' skill levels, learning curves, territory planning, and workload adaptation [178,213]. Management capabilities should focus on labor orchestration dynamic role assignment, territory-based planning, and contract governance to balance flexibility with accountability [121,208]. Social security concerns, including robbery risks and pandemic-related vulnerabilities, must be addressed [189]. Furthermore, labor rights and working conditions require more empirical study [159]. In terms of economies of scale, comparative studies on walking labor costs across regions with limited parking infrastructure are needed [144,171]. Recognizing uncertainty and managing tension during the learning process is essential for introducing innovation and boosting efficiency [66].

5.6. Innovative delivery models

Recent innovations focus on drones, electric vehicles, parcel lockers, and crowdsourcing. Drone deployment faces challenges in real-world implementation, including hub flexibility and two-tier distribution impacts [121,160]. Planning assumptions, truck-drone coordination, intermediate stops, and realistic range constraints, require more deeper studies [36,91,197,198,200,230]. Fleet composition, routing algorithms, and launch/landing timing are active research areas [112,167,173]. Electric vehicles enhance last mile delivery by improving digitization, safety, battery capacity, and environmental performance [50,58,80,92,204,229]. Further research is needed on key technical success factors, sustainability, economic profitability, and their relationship to management and customer service [80,172]. While research on parcel lockers has explored various models and implementations, but there is a need for more efficient models that offer recipient alternatives and dynamic assortment construction for flexible parcel allocation [170,237]. Load management, population density, and accessibility features are key to improving service utilization and customer satisfaction [148,157,170].

Crowdsourcing is increasingly being used to distribute goods, but there is a growing need to address trust, security, and privacy concerns to ensure product protection during transit [22,155]. Research is needed to understand the effects of unpaid labor on workers' health and safety, as well as the interactions between different types of contracts in the workplace [62]. The study of riders' availability, salaries, and the total cost and efficiency of delivery services is also crucial [184]. To enhance the service's social value creation, it is necessary to study the laws and regulations surrounding electric vehicle adoption in occasional drivers and crowd logistics [52,62,207]. Analyzing the effects of diverse crowds, including cyclists and walkers, on delivery system transportation costs and emission costs is necessary from an environmental perspective [64]. Additionally, assessing the impacts of weather on trip pricing and investigating environmental incentives on crowd shipper behavior and customer loyalty is essential [12,52,213]. Future research should explore the use of parcel lockers as intermediaries between logistic providers and crowd logistics, considering both fixed and dynamic locations [22,127,155,185]. The delivery process involves various stakeholders, including the sender, receiver, policy maker, government, and service providers, Understanding the functions and impact of these parties on market rivalry requires more studies [6,7,110]. In a competitive delivery market, LSPs should investigate factors affecting service mode selection for customer and dispatcher satisfaction [44,110,111,201,229]). Much work remains in areas of service innovation, service quality, and market transformation, as evidenced by the studies that have looked at how the COVID-19 pandemic affected consumer habits [141,195,216]. X. Wang et al. [217] suggest investigating the correlation between population density and customer evaluations of logistical effort on self-collection behavior. More environmentally friendly online retail distribution can be achieved by focusing on consumer engagement tactics. Studying obstacles to delivery procedures and the long-term viability of rural last mile delivery is highly recommended [177].

5.7. Environmental and strategic value

Parcel delivery services can enhance environmental value by ensuring regulatory compliance, cost savings, and reputation enhancement. However, there is a lack of literature on waste management and supplier assessment. Further research is needed to foster a sustainable and eco-friendly delivery process. Selecting suppliers with recycling initiatives aligns with waste management principles, ensuring minimal environmental impact and proper waste management during transportation [71,182]. Strategic alignment with value creation principles enables firms to meet societal needs, unlock new markets, foster loyalty, and optimize resources. It supports local cluster development, trust, and sustainability [77,211]. Competitive advantage is driven by reputation, stakeholder satisfaction, distinctive services, long-term relationships, and innovation [211].

This study synthesizes a wide body of literature to address three core research questions and proposes a comprehensive framework appeared in Fig. 5. In response to RQ1, the analysis identifies critical gaps in empirical validation of emerging technologies (e.g., AI, IoT, autonomous systems), the operational feasibility of innovative delivery models (e.g., drones, crowdsourcing), and the integration of behavioral, environmental, and infrastructural variables across process stages. Areas such as reverse logistics, labor deployment, and urban congestion mitigation require further investigation to expand the field's understanding. For RQ2, the study highlights key value creation factors including economies of scale, learning economies, innovation and management capabilities, social empowerment, and environmental factors, each contributing to operational efficiency, behavioral alignment, and platform design. Addressing RQ3, the findings demonstrate that sustainable value creation is shaped by economic efficiency (via infrastructure scalability and labor optimization), environmental stewardship (through emission-reducing strategies and sustainable supplier selection), and social impact (via stakeholder satisfaction, equitable labor practices, and inclusive service design). These insights culminate in a strategic framework that integrates technical and social innovations, distinctive service offerings, and long-term relationship-building to enhance reputation, attract loyal customers, and solve social and environmental challenges. Fig. 5 operationalizes this agenda by mapping targeted interventions across five core parcel delivery process stages, offering a roadmap for future research and practice aimed at generating sustained competitive advantage.

6. Conclusions

Over the past decade, the significant increase in e-commerce demand and population growth has driven significant research into parcel delivery. This systematic literature review, based on 138 articles published between 2015 and August 2025, evaluates the current state of the field and identifies gaps and innovations from a sustainability and value creation perspective. We contribute to theoretical knowledge by

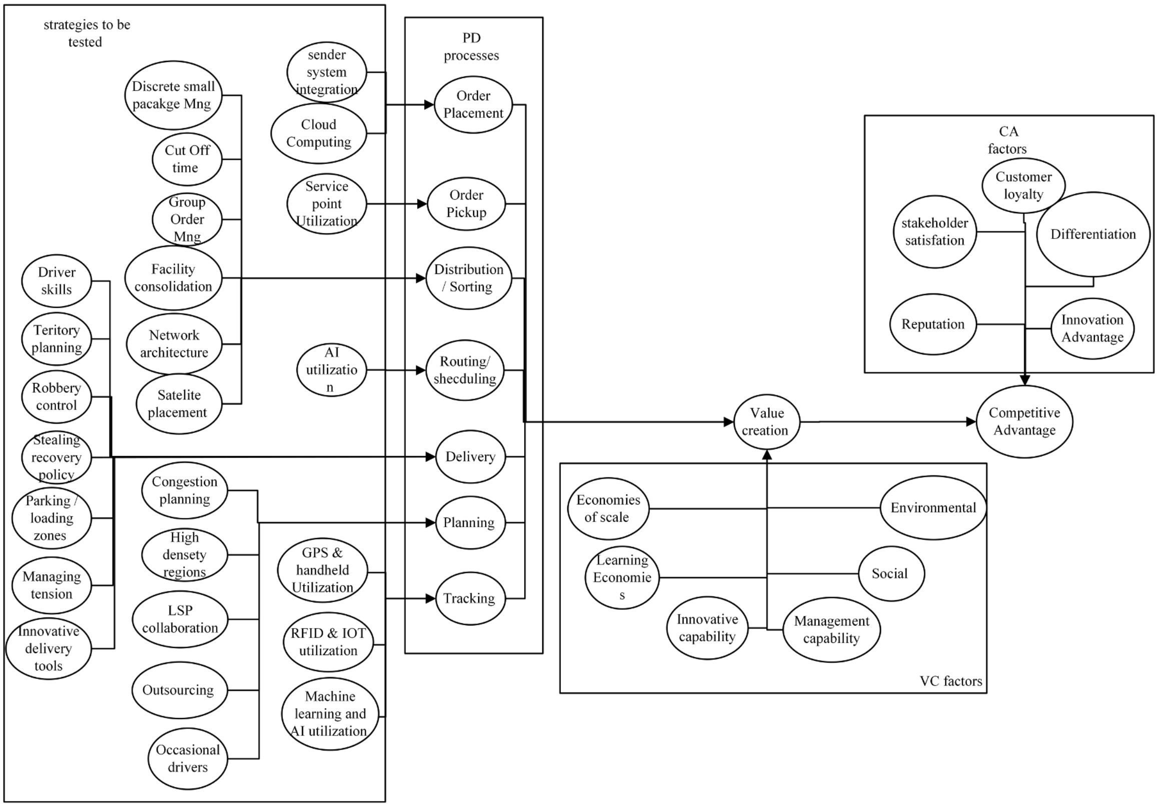

Fig. 5. Framework of strategies to be tested in the parcel delivery process to achieve sustainable value creation and competitive advantage.

presenting a framework that integrates sustainability and operational value creation in the parcel delivery process. This review, utilizing the specified framework, enhances understanding of the parcel delivery process and offers managers a broader perspective for designing the process to create value for customers and all stakeholders. The study also examines value creation in the processes of order placement, pick-up, distribution/sorting, scheduling, delivery, planning, and tracking. The research highlights the significance of innovation competencies and information technology applications in the order placement procedure. It investigates the necessity for LSPs to integrate with e-commerce systems and employ cloud computing and AI technologies. It also identifies potential avenues for further investigation, including the examination of the relationship between drivers' skill levels and fuel consumption and costs, the exploration of drones and electric vehicles in last mile delivery, and the assessment of the efficiency of parcel lockers and crowdsourcing in distribution. Furthermore, it highlights the importance of addressing trust, security, and privacy issues, as well as the role of diverse stakeholders in the delivery process. Further research should examine tracking processes and their value for customers. In particular, studies could explore how real-time visibility, delivery notifications, and predictive updates influence customer trust and perceived service quality. Moreover, evaluating the usability, accessibility, and technological reliability of tracking tools would provide deeper insights into their role in enhancing the overall delivery experience.

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CRediT authorship contribution statement

Wafa AlMazrouei: Writing – original draft, Visualization, Validation, Software, Resources, Methodology, Investigation, Formal analysis, Data curation, Conceptualization. **Emrah Demir:** Writing – review & editing, Validation, Supervision, Project administration, Conceptualization.

Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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Appendix

Table 4
Reviewed articles and their thematic reflection.

Value creation criteria	Articles discusses the topic
Economies of scale	Agnimo et al. [1], Akamatsu & Oyama [2], Akeb et al. [4], Allen et al. [8], Antit et al. [9], Arslan et al. [10], Avgerinos et al. [11], Baldi et al. [13], Baloch & Gzara [14], Bathke & Munch [17], Bell et al. [18], Bender et al. [19], Boccia et al. [21], Bray [24], Bruni et al. [26], Bruni et al. [25], Buldeo Rai et al. [28], Cagliano et al. [29], Cepeda-Carrión et al. [30], Chan et al. [31], C. F. Chen et al. [33], C. Chen et al. [32], J. C. Chen et al. [35], J. C. Chen et al. [34], R. Cheng et al. [37], Ciobotaru & Chankov [38], Čižiūnienė et al. [39], Cortes & Suzuki [41], de Assis et al. [45], de Freitas & Penna [46], Díaz-Ramírez et al. [51], Duarte et al. [53], Elsayed & Mohamed [55], ElSayed et al. [54], Eskandarzadeh & Fahimnia [57], Florio et al. [61], Frehe et al. [62], Frey et al. [63], Ghiringhelli & Virili [65], Ghoniem et al. [67], Gläser et al. [69], Hagen & Scheel-Kopeinig [70], Hoogeboom et al. [73], Z. Hu et al. [76] Iacobucci et al. [78], Inoue & Hashimoto [79], Jaegler et al. [81], Jang et al. [83], Jung & Kim [85], Kafle et al. [86], Kang et al. [87], Kawa & Zdrenka [88], W. Kim & Wang [93], Kirschstein [95], Koh et al. [97], Kokkinou et al. [98], Köster et al. [99], Kötschau et al. [100], Kulkarni et al. [102], Kweon et al. [103], Lan & Suzuki [105], Lee et al. [107], E. K. H. Leung et al. [108], Y. Li et al. [113], Liang et al. [114], Lin et al. [117], S. Liu et al. [118], S. Liu et al. [119], Y. Liu & Li [120], Y. Liu et al. [122], Lu et al. [123], Lu et al. [124], Luo et al. [125], Lyu & Teo [126], Marchet et al. [129], Martin et al. [130], Martinez-Sykora et al. [131], McLeod et al. [133], Merkert et al. [136], Moore & Newsome [140], Murray & Raj [145], Naclerio & De Giovanni [146], T. T. T. Nguyen et al. [147], Nieto-Isaza et al. [149], Nolz et al. [150], Orenstein & Raviv [151], Ozyavas et al. [152], Peng et al. [156], Perboli & Rosano [158], Polydoropoulou et al. [162], Ponsignon et al. [163], Praet & Martens [164], Rave et al. [169], Raviv [170], Sadati et al. [176], Sawadsitang et al. [179], Scherr et al. [180], Schwerdfeger & Boysen [183], She & Ouyang [187], She & Ouyang [186], Shen et al. [188], V. Silva et al. [190], Subramanyam et al. [194], Sułkowski et al. [195], Tapia et al. [199], Thomas et al. [202], Trott et al. [205], Vakulenko et al. [207], Verheyen & Kołacz [208], Voigt et al. [209], Vrhovac et al. [210], F. Wang et al. [212], X. Wang & Yuen [219], X. Wang et al. [217], X. Wang, Wong, et al. [218], X. Wang et al. [220], X. Wang, Zhen, et al. [221], Wei et al. [222], Wen & Wu [223], Wissink [224], Xiang et al. [225], F. Xiao et al. [226], H. Xiao et al. [227], Z. Xiao et al. [228], X. Yang et al. [232], Y. Yang et al. [233], Yin et al. [234], S. Yu & Jiang [236], Z. Zhang & Zhang [239], L. Zhao et al. [240], Q. Zhao et al. [241], Zhen, Tan, et al. [242], Zhen, Wu, et al. [243], M. Zhou et al. [245], Y. Zhou et al. [246]
Learning economies	Čižiūnienė et al. [39], Duarte et al. [53], Ghiringhelli & Virili [65], Hirose Nishihara [72], Iacobucci et al. [78], Jang et al. [83], Kang et al. [87], Y. Li et al. [113], Lyu & Teo [126], T. T. T. Nguyen et al. [147], Polydoropoulou et al. [162], Praet & Martens [164], Ramírez-Villamil et al. [166], She & Ouyang [186]
Innovation capabilities	Agnimo et al. [1], Akamatsu & Oyama [2], Akeb et al. [4], Antit et al. [9], Arslan et al. [10], Baldi et al. [13], Baloch & Gzara [14], Bathke & Munch [17], Bell et al. [18], Bender et al. [19], Boccia et al. [21], Bray [24], Bruni et al. [25], Buldeo Rai et al. [28], Cagliano et al. [29], Chan et al. [31], C. F. Chen et al. [33], C. Chen et al. [32], J. C. Chen et al. [35], J. C. Chen et al. [34], R. Cheng et al. [37], Ciobotaru & Chankov [38], Čižiūnienė et al. [39], Cortes & Suzuki [41], de Assis et al. [45], de Freitas & Penna [46], Díaz-Ramírez et al. [51], Elsayed & Mohamed [55], ElSayed et al. [54], Eskandarzadeh & Fahimnia [57], Florio et al. [61], Frehe et al. [62], Frey et al. [63], Ghiringhelli & Virili [65], Ghoniem et al. [67], Gläser et al. [69], Hagen & Scheel-Kopeinig [70], Hoogeboom et al. [73], Z. Hu et al. [76] Jaegler et al. [81], Jang et al. [83], Jung & Kim [85], Kafle et al. [86], Kang et al. [87], W. Kim & Wang [93], Kirschstein [95], Kokkinou et al. [98], Köster et al. [99], Kötschau et al. [100], Kulkarni et al. [102], Kweon et al. [103], Lan & Suzuki [105], Lee et al. [107], E. K. H. Leung et al. [108], Y. Li et al. [113], Liang et al. [114], S. Liu et al. [118], S. Liu et al. [119], Y. Liu & Li [120], Y. Liu et al. [122], Lu et al. [123], Lu et al. [124], Luo et al. [125], Lyu & Teo [126], Marchet et al. [129], Martin et al. [130], Martinez-Sykora et al. [131], McLeod et al. [133], Merkert et al. [136], Moore & Newsome [140], Murray & Raj [145], Naclerio & De Giovanni [146], T. T. T. Nguyen et al. [147], Nieto-Isaza et al. [149], Nolz et al. [150], Orenstein & Raviv [151], Ozyavas et al. [152], Peng et al. [156], Perboli & Rosano [158], Polydoropoulou et al. [162], Ponsignon et al. [163], Praet & Martens [164], Rave et al. [169], Raviv [170], Sadati et al. [176], Sawadsitang et al. [179], Scherr et al. [180], Schwerdfeger & Boysen [183], She & Ouyang [187], She & Ouyang [186], Shen et al. [188], V. Silva et al. [190], Subramanyam et al. [194], Sułkowski et al. [195], Tapia et al. [199], Thomas et al. [202], Trott et al. [205], Vakulenko et al. [207], Voigt et al. [209], F. Wang et al. [212], X. Wang & Yuen [219], X. Wang et al. [220], X. Wang, Zhen, et al. [221], Wei et al. [222], Wen & Wu [223], Wissink [224], Xiang et al. [225], F. Xiao et al. [226], H. Xiao et al. [227], Z. Xiao et al. [228], X. Yang et al. [232], Y. Yang et al. [233], Yin et al. [234], S. Yu & Jiang [236], Z. Zhang & Zhang [239], L. Zhao et al. [240], Q. Zhao et al. [241], Zhen, Tan, et al. [242], Zhen, Wu, et al. [243], M. Zhou et al. [245], Y. Zhou et al. [246]
Management capabilities	Agnimo et al. [1], Akamatsu & Oyama [2], Allen et al. [8], Antit et al. [9], Avgerinos et al. [11], Baldi et al. [13], Baloch & Gzara [14], Bathke & Munch [17], Bender et al. [19], Bray [24], Bruni et al. [25], Cagliano et al. [29], Chan et al. [31], J. C. Chen et al. [35], R. Cheng et al. [37], Ciobotaru & Chankov [38], Čižiūnienė et al. [39], Cortes & Suzuki [41], de Assis et al. [45], de Freitas & Penna [46], Duarte et al. [53], Eskandarzadeh & Fahimnia [57], Florio et al. [61], Frehe et al. [62], Ghiringhelli & Virili [65], Ghoniem et al. [67], Gläser et al. [69], Hagen & Scheel-Kopeinig [70], Jaegler et al. [81], Kafle et al. [86], Kang et al. [87], Koh et al. [97], Köster et al. [99], Kötschau et al. [100], Kulkarni et al. [102], Kweon et al. [103], E. K. H. Leung et al. [108], Y. Li et al. [113], Lin et al. [117], S. Liu et al. [118], Y. Liu & Li [120], Y. Liu et al. [122], Lu et al. [123], Lu et al. [124], Lyu & Teo [126], Martin et al. [130], Martinez-Sykora et al. [131], McLeod et al. [133], Merkert et al. [136], T. T. T. Nguyen et al. [147], Nieto-Isaza et al. [149], Orenstein & Raviv [151], Ozyavas et al. [152], Perboli & Rosano [158], Praet & Martens [164], Rave et al. [169], Raviv [170], Scherr et al. [180], Schwerdfeger & Boysen [183], She & Ouyang [186], Shen et al. [188], V. Silva et al. [190], Subramanyam et al. [194], Sułkowski et al. [195], Trott et al. [205], Voigt et al. [209], F. Wang et al. [212], X. Wang, Zhen, et al. [221], Wei et al. [222], Wissink [224], Xiang et al. [225], F. Xiao et al. [226], H. Xiao et al. [227], Z. Xiao et al. [228], X. Yang et al. [232], Y. Yang et al. [233], Yin et al. [234], S. Yu & Jiang [236], Z. Zhang & Zhang [239], Q. Zhao et al. [241], Zhen, Wu, et al. [243], Y. Zhou et al. [246].
Social aspect	Agnimo et al. [1], Akamatsu & Oyama [2], Akeb et al. [4], Baloch & Gzara [14], Bathke & Munch [17], Bell et al. [18], Bray [24], Bruni et al. [26], Cagliano et al. [29], Cepeda-Carrión et al. [30], C. F. Chen et al. [33], J. C. Chen et al. [35], R. Cheng et al. [37], Ciobotaru & Chankov [38], Čižiūnienė et al. [39], Duarte et al. [53], Elsayed & Mohamed [55], ElSayed et al. [54], Florio et al. [61], Frehe et al. [62], Frey et al. [63], Ghoniem et al. [67], Gläser et al. [69], Hagen & Scheel-Kopeinig [70], Hoogeboom et al. [73], Z. Hu et al. [76] Iacobucci et al. [78], Jaegler et al. [81], Jang et al. [83], Jung & Kim [85], Kafle et al. [86], Kang et al. [87], Kawa & Zdrenka [88], W. Kim & Wang [93], Koh et al. [97], Kokkinou et al. [98], Köster et al. [99], Kötschau et al. [100], Kulkarni et al. [102], E. K. H. Leung et al. [108], Y. Li et al. [113], Liang et al. [114], Lin et al. [117], S. Liu et al. [119], Y. Liu & Li [120], Y. Liu et al. [122], Lyu & Teo [126], Marchet et al. [129], Martin et al. [130], Martinez-Sykora et al. [131], McLeod et al. [133], Merkert et al. [136], Moore & Newsome [140], Naclerio & De Giovanni [146], T. T. T. Nguyen et al. [147], Orenstein & Raviv [151], Ozyavas et al. [152], Perboli & Rosano [158], Polydoropoulou et al. [162], Ponsignon et al. [163], Praet & Martens [164], Sadati et al. [176], Shen et al. [188], V. Silva et al. [190], Sułkowski et al. [195], Tapia et al. [199], Trott et al. [205], Vakulenko et al. [207], Verheyen & Kołacz [208], Vrhovac et al. [210], F. Wang et al. [212], X. Wang & Yuen [219], X. Wang et al. [217], X. Wang et al. [220], Wei et al. [222], Wen & Wu [223], Wissink [224], F. Xiao et al. [226], Z. Xiao et al. [228], X. Yang et al. [232], S. Yu & Jiang [236], Z. Zhang & Zhang [239], L. Zhao et al. [240], Q. Zhao et al. [241], Zhen, Wu, et al. [243], M. Zhou et al. [245].
Environmental aspect	Antit et al. [9], Arslan et al. [10], Bell et al. [18], Bruni et al. [25], Buldeo Rai et al. [28], Cagliano et al. [29], Chan et al. [31], J. C. Chen et al. [35], Čižiūnienė et al. [39], Díaz-Ramírez et al. [51], Elsayed & Mohamed [55], ElSayed et al. [54], Hagen & Scheel-Kopeinig [70], W. Hu et al. [75], Z. Hu et al. [76], Jaegler et al. [81], Jung & Kim [85], Kang et al. [87], W. Kim & Wang [93], Kirschstein [95], Koh et al. [97], Kokkinou et al. [98], Köster et al. [99], Lee et al. [107], Liang et al. [114], Y. Liu et al. [122], Lu et al. [123], Luo et al. [125], Martinez-Sykora et al. [131], McLeod et al. [133], Nolz et al. [150], Orenstein & Raviv [151], Ozyavas et al. [152], Praet & Martens [164], Ramírez-Villamil et al. [166], Sadati et al. [176], Sawadsitang et al. [179], She & Ouyang [186], Shen et al. [188], V. Silva et al. [190], Subramanyam et al. [194], Tapia et al. [199], Trott et al. [205], F. Wang et al. [212], Wen & Wu [223], Wissink [224], X. Yang et al. [232], Q. Zhao et al. [241].

Data availability

Data will be made available on request.

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