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An Intelligent Decision Support System for Outsourcing Delivery Service Providers in Navigating Last-Mile Deliveries

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Abstract: In today's digital economy, consumers are increasingly shopping online, driving the need for efficient last-mile delivery solutions. As one such solution, many e-tailers have begun to use delivery service providers (DSPs). Despite the DSP's critical role in the final step of the e-logistics process, research on its utilization has been rare. To address the current research gap, this paper proposes an intelligent decision support system (IDSS) to aid DSP users in developing a systematic framework for implementing strategic DSP plans. This paper is one of the first attempts to develop a systematic decision-aid tool for DSP outsourcing by synthesizing the roles, functions, and benefits of DSPs, discussing the opportunities and challenges associated with DSP outsourcing, and offering practical guidance on the best use of DSPs for last-mile delivery services in the e-tailing sector.

Keywords: intelligent decision support system; last-mile delivery; e-logistics; delivery service provider; logistics outsourcing

1. Introduction

In today's digital economy, B2C (business-to-consumer) e-commerce is one of the fastest-growing markets worldwide. Spurred by the widespread internet proliferation, shopping convenience, and direct delivery services, the global e-commerce market reached approximately $26 to 27 trillion in 2024 and is expected to reach around $83 trillion to over $200 trillion by 2030–2033, with a compound annual growth rate (CAGR) exceeding 18% [1]. In 2024 alone, approximately 2.71 billion consumers worldwide shopped online [2]. A rapid growth in B2C e-commerce, however, poses unprecedented logistical challenges stemming from direct shipping requirements, non-traditional order fulfillment (e.g., post-sale return management), and potential in-transit theft and damage. Last-mile delivery, which links local distribution hubs to each customer's doorstep, is often the most significant source of an e-tailer's headaches due to the inherent difficulty of breaking large shipments into individual orders and navigating widely dispersed customer locations. Last-mile delivery, as the final leg of the e-tailing supply chain, can determine the success of B2C ecommerce by directly shaping the customer experience and affecting the e-tailer's profitability. As such, sustained ecommerce success hinges on the e-tailer's ability to adapt quickly to rapidly evolving last-mile delivery services. For example, some of today's customers may require a service beyond same-day delivery, with the assurance of damage-free shipping, if the product they ordered is time-sensitive, fragile, or perishable. Indeed, through partnerships with Cardenas Markets, Bristol Farms, Save Mart Supermarket, and Food Maxx, Amazon Fresh began offering ultra-fast shipping with a one- or two-hour delivery window in certain ZIP code areas [3].

To address ultra-fast shipping requests, a growing number of e-tailers, such as Amazon, have begun establishing micro-fulfillment centers and hyperlocal logistics networks with the aid of delivery service providers. Generally, a delivery service provider (DSP) is a third-party courier that handles the complexities of seamless last-

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mile delivery for e-tailers, ensuring items reach customers' doorsteps safely, efficiently, and on time. Many DSPs also offer order-tracking services that allow their client customers to monitor delivery status in real time with transparency, creating a positive customer experience that ultimately leads to customer satisfaction [4]. Some DSPs also handle returned products [5]. Examples of DSP include FedEx, UPS, DHL, US Cargo, Uber, GoShare, and other local delivery specialists. As shown in Figure 1, the DSP typically follows the routine step-by-step procedures to manage last-mile delivery services.

To help e-tailers maximize the benefits of DSP, the primary purposes of this paper are to discuss unique opportunities and challenges of the DSP selection decision, outline step-by-step DSP implementation procedures, predict future developments in DSP utilization in the e-tailing sector, and develop practical business strategies for enhancing last-mile delivery service quality in real-world settings. Hence, we attempt to address the following research questions:

(1) What are the specific roles of DSP in a last-mile delivery system?
(2) How to integrate and coordinate DSP in a last-mile delivery system?
(3) How to select the right DSP? What are appropriate DSP selection criteria?
(4) How to accomplish the most cost-efficient and timely last-mile delivery with the aid of DSP?

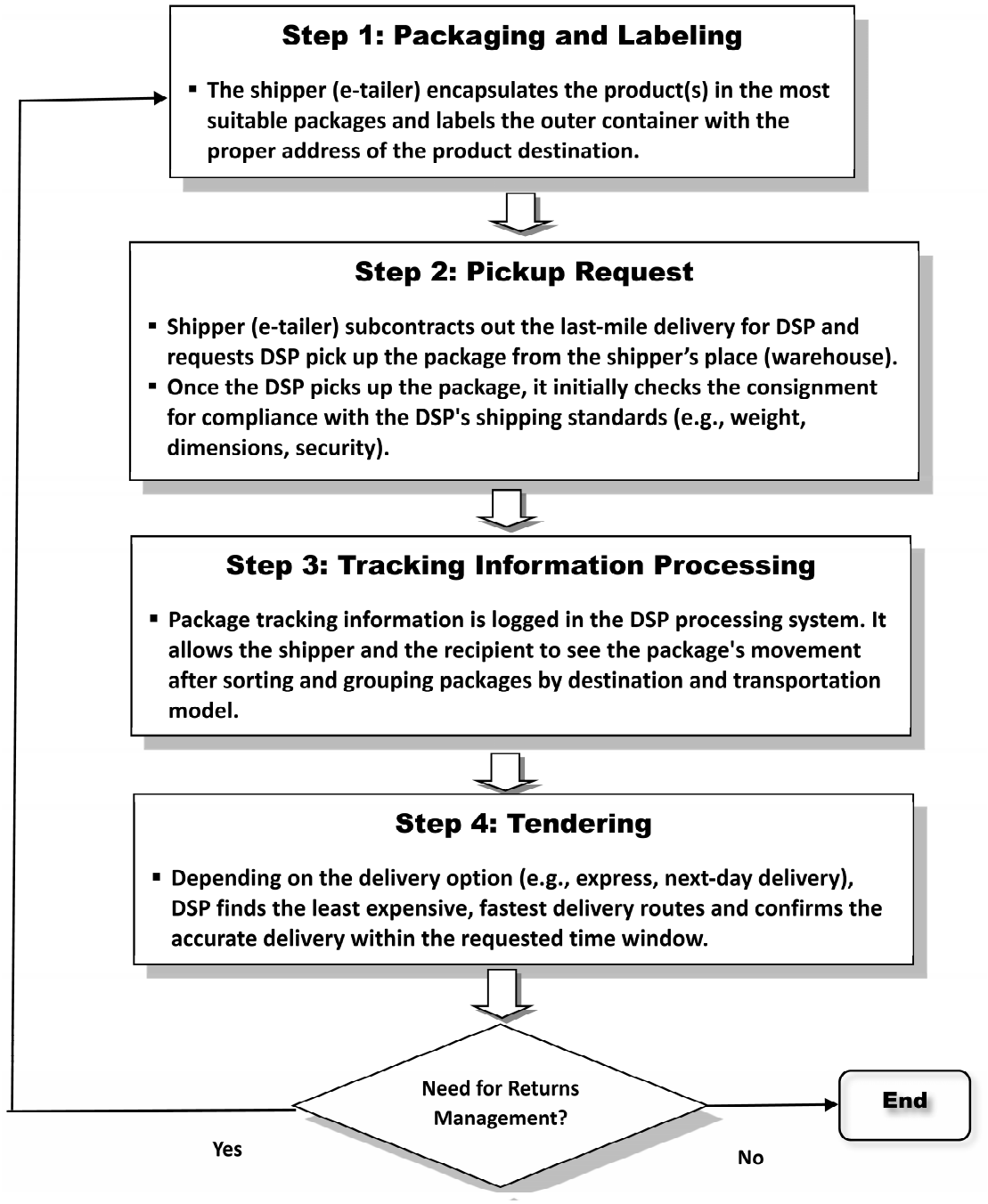

Figure 1. The delivery service provider routine task processes.

2. Prior Literature

Since the last-mile delivery is the final, direct touchpoint with the end customer, it leaves a lasting impression on the customer's online buying experience and, in turn, dictates customer satisfaction and loyalty. Due to their critical role in the success of e-tailing businesses, last-mile delivery operations have received significant attention from practitioners and academics worldwide. Reflecting the growing trend of online shopping in the wake of the COVID pandemic, the literature on last-mile delivery is abundant [6–9]. The primary focus of such literature includes the determination of parcel pick, fulfillment center, and collection delivery point location, the development of mathematical models for planning last-mile delivery routes and schedules in an urban logistics setting, the design of e-logistics platforms, the establishment of a parcel locker network for last-mile delivery, and the design of a sustainable last-mile network comprised of consolidation centers, shared micro-depots, shared freight transportation, electric vehicles (EVs), and collection and delivery points (CDPs) [8,10–19]. None of the extant literature on last-mile delivery, however, has discussed the potential exploitation of DSP to deliver last-mile services more efficiently [8,20].

To fill this research gap, Sun et al. [21] proposed a mixed-integer program and a tailored solution algorithm for the coordinated dispatching of Unmanned Aerial Vehicle (UAV) fleet pilots in a cost-efficient manner. For on-demand delivery services, they found that UAVs played a critical role in balancing operational costs and freshness across heterogeneous delivery workforces (i.e., minimum-pay riders, crowdsourced riders, and UAVs). Their study is confined to UAV (drone) operations for last-mile delivery. For restaurant entrepreneurs, Sureeyatanapas & Damapong [22] proposed using fuzzy logic, like fuzzy TOPSIS, to determine the importance weights of the food DSP selection criteria in the direct rating approach, based on the perspectives of 60 restaurant operators in Thailand. Their proposed model assesses the performance of food DSPs by computing an objective composite score for each alternative based on its distance from the negative ideal solution and its proximity to the positive ideal solution. Despite its merits, their study is still limited to the food-delivery services of on-demand restaurant businesses and primarily focuses on short-term, routine food-delivery operations, without zeroing in on the development of DSP evaluation and selection criteria from a long-term strategic perspective.

As this literature review reveals, none of the extant literature on DSP has developed strategies for DSP outsourcing and selection, specific performance metrics, or practical guidelines for DSP utilization in e-tailing environments. Also, as the comprehensive literature reviews of past logistics outsourcing or third-party logistics outsourcing studies revealed, DSP outsourcing studies have never been reported in the existing logistics literature [23–26]. As such, there is a strong need for a new line of research to provide specific, practical guidance on selecting and evaluating alternative DSPs using key performance indicators (KPIs) or quantitative performance metrics within the e-logistics framework that links e-tailers and their DSPs. In response to such a research need, this paper attempts to answer some critical research questions:

(1) Why is it crucial for the e-tailer to leverage DSPs to improve its last-mile services and create competitive differentiators continuously?
(2) What will be the key opportunities and challenges of hiring DSPs?
(3) How can you select and assess the DSP's performance using specific performance metrics?
(4) How to build a long-term partnership (or strategic alliance) with the selected DSP?
(5) What will it take to take advantage of DSPs successfully?

Therefore, the primary purpose of this paper is to develop step-by-step practical guidelines for potential DSP users in the e-retail industry who have yet to embrace DSPs, as well as for actual DSP users seeking to maximize DSP productivity.

3. A Rationale for DSP Outsourcing and Selection

In today's hyper-competitive retail environment, outsourcing last-mile delivery can help e-tailers streamline the final leg of their supply chain, reduce logistics hassles, save valuable time and resources, and improve customer satisfaction. Such outsourcing entails selecting the right DSP, a critical intermediary between the e-tailer and its customers. The potential benefits of hiring a DSP include improved cash flows from eliminating capital investments in delivery vehicles, personnel, distribution infrastructure, and digital asset-tracking systems. In addition, DSP offers flexibility since it can adjust delivery volume and schedules according to ebb-and-flow demand fluctuations (e.g., temporary sales promotions), seasonal peaks (e.g., holidays), and economic cycles, while managing product returns and handling direct customer feedback (e.g., complaints, urgent delivery requests, advanced shipping notices).

To fully exploit the benefits of DSP, the e-tailer must determine its specific delivery needs, evaluate multiple DSP candidates, and select the right DSP using systematic selection criteria. First of all, delivery needs should be

classified into three categories [27]: (1) type of goods (e.g., perishable goods requiring temperature controls, fragile products requiring careful handling with sturdy packages); (2) delivery time widnows (e.g., same day delivery, prime delivery, standard delivery); (3) geographical coverage (e.g., local, national, international). Depending on these delivery needs, the e-tailer should consider multiple DSP selection criteria that matter most to the quality of last-mile delivery. Table 1 summarizes a list of DSP selection factors and their importance to DSP selection.

Table 1. DSP selection criteria and their justifications.

Selection Criteria	Rationale
Delivery performance and reliability	A DSP's track record of on-time deliveries, damage-free shipments, and the ability to handle fragile, perishable items is essential to customer satisfaction.
Geographical service coverage	A DSP's limited geographic coverage can hamper service to some customers in isolated or remote areas. On the other hand, DSP's wide range of geographical services expands its users' market reach.
Transparent pricing	The total cost structure (e.g., total cost of ownership) helps the DSP user estimate the true cost of outsourcing DSP without hidden fees or unexpected surcharges.
Technological support (including tracking systems)	Real-time asset tracking, proof of delivery, and user-friendly platforms for seamless integration are essential for monitoring shipments.
Service flexibility	DSP's ability to handle product returns, rush/emergent delivery schedules, odd-sized products, curbside pickups, and on-demand services can enhance the ultimate customer experience and subsequent satisfaction.
Insurance coverage	DSP's claims handling and adequate insurance for damaged or lost items minimize the DSP user's risk.
Sustainability	DSP's efforts to use green or electric vehicles and implement carbon offset programs enhance its brand image and alignment with corporate social responsibility.
Reputation and financial stability	Positive user testimonials and industry reputation indicate the DSP's trustworthiness.

4. Research Methodology

As discussed earlier, the decision to outsource and select a DSP requires careful strategic plan to increase the chances of success. To develop such a plan, we propose the intelligent decision support system (IDSS) and strategy map as the key research methodology. The detailed rationale for this methodology is as follows.

IDSS for DSP is an AI-driven decision-aid tool that transforms complex logistics data from multiple structured and unstructured sources into actionable insights and real-time strategic solutions to support DSP outsourcing decisions. By integrating machine learning, optimization techniques, and prescriptive analytics, the proposed IDSS helps e-tailers maximize DSP fleet efficiency, optimize order assignments to DSP carriers, reduce operating expenses for last-mile delivery, and meet tight service-level agreements (SLAs). Since last-mile delivery operations entail costly, labor-intensive, vehicle-based point-to-point deliveries, the DSP outsourcing and selection decision should assess its impacts on asset management, customer service quality, and the financial viability of last-mile deliveries. To make such an assessment and complement IDSS, we utilized strategy mapping. This strategy mapping is intended to address the questions of whether DSP outsourcing is the right strategy, which strategic role DSP should play, and how DSP should be deployed to maximize last-mile delivery performance. The strategic mapping helps e-tailers manage DSP outsourcing more systematically by providing visual markers, tracking decision outcomes over time, and allowing them to adapt their outsourcing decisions to changing delivery scenarios. The next two sections describe the detailed frameworks of IDSS and strategy mapping.

4.1. The Architecture and Key Components of An Intelligent Decision Support System

Designing an intelligent decision support system (IDSS) for outsourcing DSP requires combining data, business rules, and decision and recommendation engines, as shown in Figure 2. As a core intelligence component, a decision engine consists of four integrated subcomponents: (1) strategy mapping, (2) rule-based filtering, (3) DSP evaluation scoring model, and (4) machine learning algorithm. To elaborate, rule-based filtering plays a critical role in an Intelligent Decision Support System (IDSS) by screening, evaluating, and prioritizing information according to predefined "if-then" rules before recommendations are presented to logistics managers responsible for making a DSP outsourcing decision. This subcomponent aims to eliminate unsuitable alternatives (e.g., untimely or excessively expensive deliveries) and highlight the most appropriate options. This subcomponent not only reduces information overload by filtering irrelevant alternatives but also improves managerial judgment

accuracy by presenting only the most sensible alternative. In the next step, a systematic DSP scoring method, such as the analytic hierarchy process (AHP) or multi-attribute utility theory (MAUT), can be used to determine the most desirable DSP for last-mile deliveries. As the final optional step, a machine learning (ML) tool can supplement DSP scoring and ranking processes by providing additional details on the DSP outsourcing outcome. For example, the ML tool can help the manager predict the delivery time and the probability of unmet or late deliveries. The recommendation engine that allows for what-if scenario simulation can continuously refine its recommendations based on outcomes and feedback. As shown in Figure 2, these components are closely tied to interconnected processes that start with strategy mapping. The following subsection provides specific details on the role of strategy mapping in IDSS and the strategy map designed for DSP outsourcing and selection across the four dimensions of the balanced scorecard (BSC) framework.

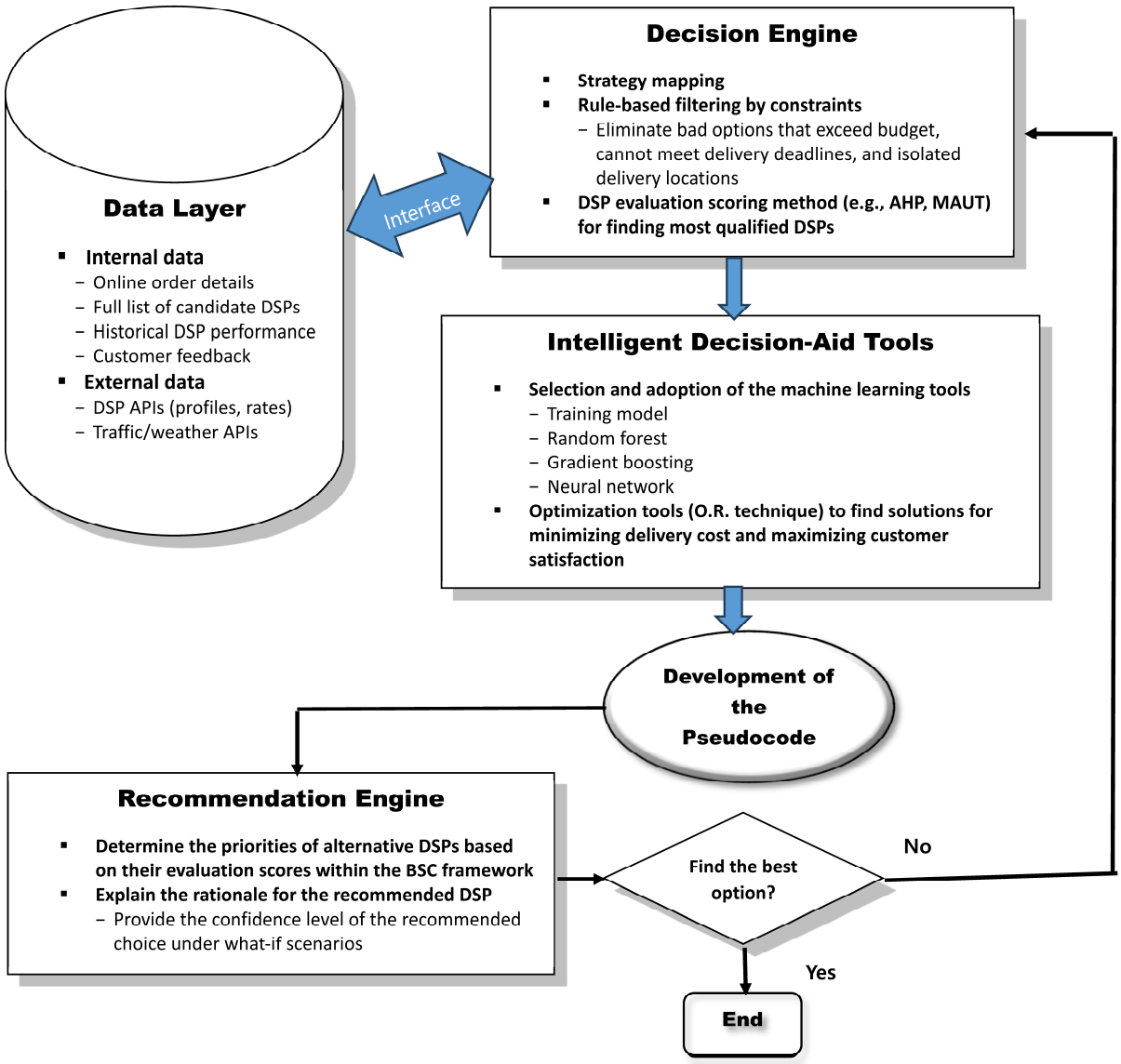

Figure 2. The architectural framework of intelligent decision support system.

4.2. Strategy Mapping

Since the DSP outsourcing decision is a strategic decision with cross-functional impacts on cost, customer experience, operational efficiency, and market competitiveness, a strategy map is justified for translating e-logistics strategy into measurable DSP selection criteria from multi-dimensional perspectives, visualizing cause–and–effect relationships between DSP capabilities and the e-tailer's organizational outcomes, and strengthening the theoretical and practical validity of the DSP selection framework. In addition, a strategy map can be further justified because it allows the e-tailer to balance short-term efficiency and long-term resilience and to make a less subjective, politically influenced DSP outsourcing decision with a structured rationale. As a simple yet practical tool for guiding DSP utilization, we propose a strategy map that visually represents detailed strategic action plans

for last-mile delivery operations. Simply put, a strategy map is a diagram that visually displays an organization's strategy on a single page [28]. It helps make the organization's strategic action plans transparent and communicate big-picture, long-term goals to multiple stakeholders in simple terms [28,29]. Figure 3 shows a strategy map for DSP deployment in the e-tailing industry from four per-spectives.

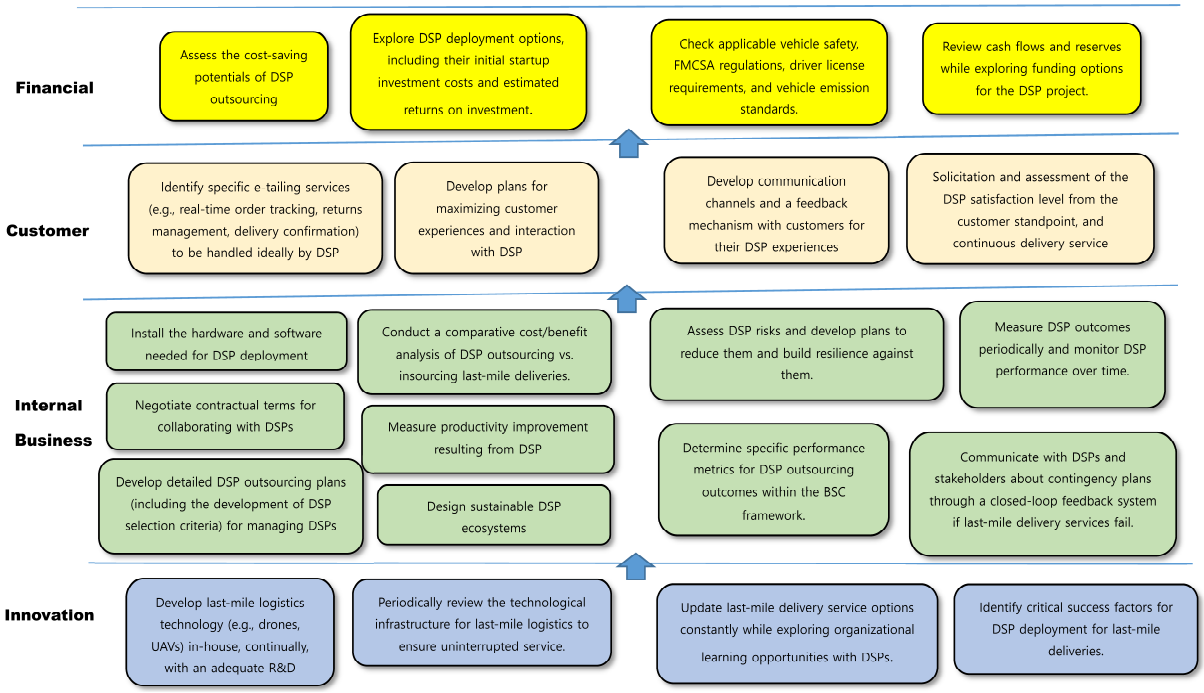

Figure 3. Strategy map for DSP deployment.

5. DSP Milestone and Outcome Assessment

To constantly monitor the progress and outcome of DSP initiatives for last-mile delivery operations, DSP outsourcers must create step-by-step milestones that are specified below:

(1) Identify specific online customer needs and priorities to help the e-tailer enhance service quality, and then determine which internal resources are required to meet them.
(2) Compare the cost efficiency of in-house to outsourced last-mile delivery services and determine whether outsourcing outweighs the benefits of in-house operations.
(3) Develop a list of potential DSPs that have financial and logistics capacity to handle required last-mile delivery services, ensure a complete understanding of e-logistics among candidate DSPs with an explicit request for proposal (RFP), and then select the DSP that can bring industry and market knowledge, and come with a vast array of e-logistics experiences.
(4) Define optimum performance outcomes that the selected DSP or shortlisted DSPs should fulfill and enter a last-mile delivery outsourcing partnership built upon a transparent roadmap without any ambiguity.
(5) Design a quantitative DSP evaluation scorecard and periodically check and see if the DSP meets performance expectations while constantly monitoring the DSP's performance outcomes based on the concrete feedback from online customer feedback on pros and cons of the selected DSP or shortlisted DSPs.
(6) Decide on either renewal or termination of contracts with the existing DSP based on performance outcomes, e-tailers' needs and desired capabilities in the future, and how the DSP can continue to support last-mail logistics.

Periodically, the e-tailer needs to assess the DSP's performance using the performance metrics developed in the earlier step. Since the DSP performance outcome should be evaluated holistically based on its long-term impact on the e-tailer's last-mile delivery service improvement and cost-saving opportunities, this paper proposes the BSC framework that was introduced by Kaplan and Norton [30], who designed a systematic mechanism for evaluating the success of a new strategy (or initiative) implementation. Since DSP outsourcing can be regarded as a viable e-tailing strategy, BSC is a valuable tool for measuring the performance outcomes of DSP adoption. Specifically, in contrast to traditional performance measures that use single-dimensional metrics such as cost per delivery and the number of packages delivered, BSC can integrate financial and non-financial measures, such as customer satisfaction and delivery accuracy. Therefore, the BSC enables a comprehensive, fair, and strategic assessment of

DSP performance and supports continuous improvement and long-term service sustainability. As shown in Figure 4, the BSC reflects four perspectives that matter most to the e-retailer's decisions regarding DSP outsourcing.

Among those perspectives, the customer perspective may be the most important, as it directly influences the e-tailer's bottom line, such as profitability. The customer perception of DSP depends on how fast DSP can deliver on the functional needs (e.g., order fulfillment speed, convenience), how accurately DSP can make a last-mile delivery (e.g., delivery to the correct address with the correct item and damage-free content), how well DSP can meet the online customer's social-emotional and relational needs (e.g., the DSP driver's courtesy, friendliness, live chats, photo proof of delivery, SMS/email/app notifications, door step safety, easy return pickup with the pre-paid return labels). Positive customer perception of DSP will lead to customer loyalty, repeat patronage, and an increase in e-tailing sales revenue. Given the importance of customer acceptance of DSP to e-tailing success, DSP users should continuously monitor last-mile service performance from the customer perspective using appropriate metrics. Among those metrics, priorities include assessing the impact of DSPs on the e-tailer's customer relationship management (CRM) as well.

Another perspective essential for gauging the success of the DSP implementation is an internal business perspective that reflects the e-tailer's employees' viewpoints and internal organization structures. Since DSP adoption may create role conflicts for service employees and heighten fear about its impact on job security, DSP outsourcing may adversely affect e-tailers' employees' morale and increase job dissatisfaction. On the other hand, the e-tailer's partnership with DSP can alleviate the financial and managerial burden of last-mile delivery, as DSP manages delivery drivers and vehicles. DSPs can facilitate last-mile service innovation by expanding the dimensions of service. For example, with the aid of localized DSPs, the e-tailer can establish smart or self-service lockers in apartment/office building complexes, localized "dark stores" (inventory only small hubs), and micro warehouses with short radius (e.g., one to five miles) of concentrated online customer locations that will allow for the e-tailer's near instant deliveries and off-peak deliveries (late night, early morning deliveries). As DSP outsourcing continues, the DSP user (i.e., e-tailer) may also gain detailed insights into successful last-mile delivery operations, which can be shared with DSPs to improve last-mile delivery services further through continuous learning. To get the most out of DSP, its adopters (e-tailers) should examine the financial implications (e.g., reduced startup investment in last-mile delivery infrastructure and labor cost savings) of outsourcing to DSP and convince the e-tailer's stakeholders that it is worthy of consideration and implementation. Such examination can be organized systematically around a value proposition that includes key metrics considered indicators of the financial success of DSP implementation as recapitulated in Table 2.

Table 2. The value propositions of DSP outsourcing.

Target Stakeholders	Value Propositions	Expected Outcomes	Key Metrics
Customer	• What customer value (e.g., cost value, use value) does the DSP create by handling last-mile delivery services?	Greater customer satisfaction and retention, brand loyalty	• Customer defection rate • Frequency of repeat online purchases • Word-of-mouth reputation
Organization	• What financial value does the DSP bring to the organization?	Increased profitability	• Sales revenue • Market share • Cash flows
Employee	• What is the added value of DSP for improving the e-tailer's last-mile delivery service efficiency?	Increased labor productivity and employee job satisfaction	• Labor cost savings • Asset return • Employee turnover ratio
Shareholder	• To what extent does the shareholder value increase thanks to DSP outsourcing?	Increased stock prices	• Earnings per share • Shareholder value added

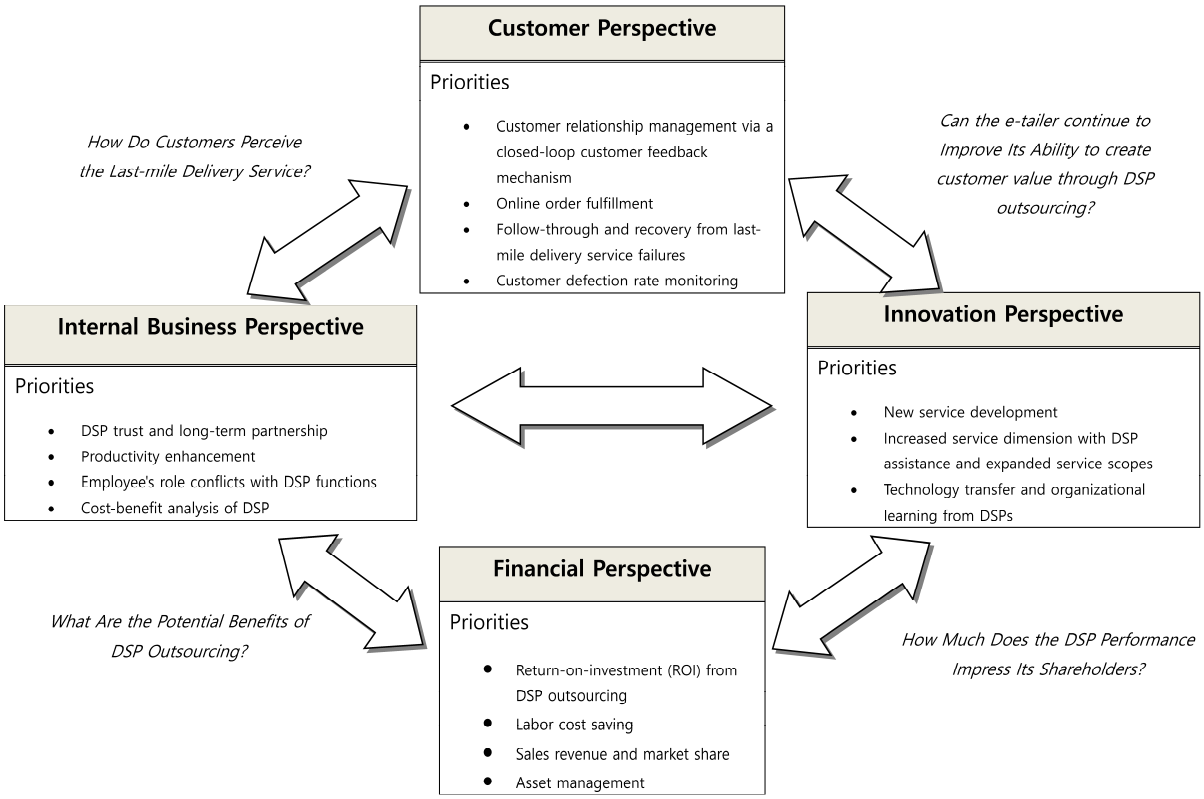

Figure 4. BSC framework for measuring the DSP project outcome.

6. Lessons Learned from DSP Outsourcing and the Future of the DSP

In closing, to provide detailed managerial insights of DSP utilization, this paper highlights key lessons from actual DSP implementation in the real-world e-tailing industry, summarized below.

- In 2018, Amazon launched the DSP program after building partnerships with United Parcel Service (UPS), FedEx, US Postal Service (USPS), individuals who are on the Amazon Flex program and use their own vehicles to deliver Amazon packages, and local/independent couriers (e.g., OnTrac, LaserShip) which run Amazon-branded van fleets, use Amazon uniformed drivers and rely on Amazon's delivery management technology such as real-time tracking and route optimization. To be qualified for Amazon's DSP program, DSP must demonstrate access to $30,000 in liquid assets that cover both the estimated business startup costs of $10,000 and other expenses associated with launching DSP [31].
- In 2013, shortly after Target launched its free in-store pickup option for customers, it began allowing customers to order a selection of 40,000 merchandise items online. This customer initiative included a "ship from store" program with promised same-day or next-day delivery. To make this program successful, Target utilized the DSP called Shipt, which handled and delivered roughly 90% of its online orders (especially grocery items) on the same day through either a smartphone app, available on iOS and Android platforms, or via its websites, while using UPS and FedEx for longer distance deliveries [32].
- Walmart uses its Spark Driver platform, where independent drivers use their own vehicles to deliver local online orders, and partners with other carriers such as UPS, FedEx, and USPS to make deliveries for itself and other retailers through its Walmart GoLocal service. The Spark Driver platform has grown to operate in all 50 US states across more than 17,000 pickup points, reaching 84% of US households, and has become Walmart's most extensive local DSP [33].

Table 3 summarizes the prospective DSPs serving the U.S. e-commerce market, along with their distinctive features and capabilities.

As illustrated earlier, DSP utilization brought many managerial benefits. Those benefits include:

- Scalability: By leveraging DSPs, e-tailers can scale their last-mile delivery capacity without directly managing every vehicle and driver. As such, DSP enables rapid growth or contraction in delivery capacity in response to demand (e.g., peak online shopping seasons during Thanksgiving holidays) while minimizing the e-tailer's fixed-asset burden. Furthermore, an e-tailer can delegate its on-the-ground management to local DSPs while monitoring DSP performance through its own control mechanism.

- Risk transfer or offloading: The DSPs assume many of the direct risks associated with operating delivery fleets (vehicles, maintenance, insurance, staffing, liability, labor, asset ownership) for last-mile delivery services. This risk transfer allows the e-tailer to focus on its core competencies (e.g., sales, marketing, warehousing, order fulfillment) rather than micromanaging last-mile delivery operations.
- Cost transparency and efficiency: Because the e-tailer typically pays DSPs a fixed monthly fee tied to freight volume, it is more predictable for the e-tailer to estimate the actual cost of last-mile deliveries. In addition, an e-tailer can negotiate favorable contractual terms (including pricing) for its DSPs (vans, insurance, equipment) without investing heavily in its own fleet, insurance, and driver payroll infrastructure.
- Improved public image and brand leverage: By hiring and empowering local entrepreneurs as DSPs, the e-tailer can support small businesses and job creation in local communities, while becoming the DSP's guaranteed "customer" and providing the DSP with package volume from the e-tailer's online customers. This support can enhance the e-tailer's positive public image and solid relationships with local stakeholders.

To sum up, the DSP program enables e-tailers to focus on their enterprise-wide logistics strategies while relying on a network of motivated, locally managed DSPs to execute last-mile delivery. However, as DSP evolves and the e-retailing industry continues to transform its practices, e-tailers should adapt their business models to changing e-tailing environments. With rising labor costs, skilled driver shortages, and high driver turnover, DSP will be a reality for the e-tailing industry for years to come.

Table 3. A summary of DSPs' regional coverage, features, and pricing.

Carrier	Capabilities	Delivery Speed	API Integration	Return Support	Pricing
UPS	Nationwide network for heavy freight delivery capability	1–5 days	Full/Open API	Best-in-class	$6.50 per package for ground residential fees; Retail: From $10.88, Commercial: From $6.23
FedEx	Time-sensitive express delivery with the dedicated network	1–3 days	Full/Open API	Robust	Retail: From $11.99 Commercial: From $7.69
USPS	Nationwide network for lightweight shipments	2–5 days	Robust	Easy	Zero or residential surcharge; Retail: From $7.90, Commercial: From $6.93
OnTrac	Major East/West regional carrier	1–2 days	Full API	Solid	Low-cost ground delivery
Lone Star Overnight (LSO)	Texas/South Central regions	Overnight/next day	Basic API	Moderate	$29.00 per package for parcels over 48 inches in length or weighing more than 70 lbs.
Veho	Premium service for high-volume e-commerce	Next day (99% on-time delivery)	Full API	Somewhat limited	Customized pricing
DHL Express	Cross-border delivery	4–10 days for international shipments	Full API	Somewhat limited	Vary widely based on weight, dimensions, origin, and destination
Amazon Logistics	Multi-channel, largest domestic parcel carrier	1–2 days, including morning delivery	Native API	Easy and convenient	Pricing depends on your service type and shipping zone; Starts at $11.99 for packages under 1 lb up to $15.85 for 10 lb.
Pirate Ship	Primarily for small to medium-sized firms, UPS partner	2–5 days	Plug and play	Basic	heavily discounted pre-negotiated UPS/USPS carrier rates

Sources: Significantly modified from [34,35].

7. Concluding Remarks

This paper makes a significant contribution to the existing literature by highlighting, for the first time, the critical role that DSP plays in the fast-growing e-tailing industry. In particular, this study can help e-tailers improve their competitiveness in the e-tailing market by leveraging their e-logistics prowess. In addition, findings from this study can guide e-tailers in developing their DSPs' performance standards and establishing long-term partnerships with DSPs. Despite its novelty, this study can be extended to include a detailed machine-learning algorithm to generate optimal assignments, routes, and schedules for DSPs within each customer service area.

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Conflicts of Interest

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Use of AI and AI-Assisted Technologies

No AI tools were utilized for this paper.

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