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Strategies to Overcome Digital Transformation Challenges in Courier Services - A Systematic Literature Review and Bibliometric Analysis

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Abstract: The rapid evolution of digital technologies has fundamentally reshaped the courier industry, prompting a wave of innovations aimed at enhancing operational performance, customer experience, and environmental sustainability. This study adopts a Systematic Literature Review (SLR), integrated with bibliometric analysis, to examine 89 peer-reviewed articles indexed in Scopus from 2018 to 2025. The findings reveal four dominant strategic pathways adopted by courier service providers to navigate digital transformation: investing in digital culture (16%), building robust technological infrastructure (45%), securing financial resources (24%), and ensuring regulatory compliance (16%). The study also highlights a surge in research activity following the COVID-19 pandemic, reflecting an industry-wide urgency to modernize last-mile delivery operations. By synthesizing these insights, the research offers a conceptual framework for future strategic alignment and provides actionable guidance for courier firms facing the pressures of digital disruption.

Keywords: Digital Transformation, Courier Services, Logistics Innovation, Bibliometric Analysis, Systematic Review, Last-Mile Delivery

INTRODUCTION

Amidst an era where digital technologies are rapidly advancing and shifting consumer behaviors have redefined the landscape of the global courier industry. In Indonesia, the Courier, Express, and Parcel (CEP) sector has marked a remarkable journey of growth, driven by the e-commerce boom and service for last-mile delivery's growing demand (Marsita & Maniah, 2024). By 2029, the market is forecasted to grow at a compound annual growth rate (CAGR) of 12.55%, logistics providers face significant opportunities to optimize daily-operation as well expand market share (MarkPlus, 2024). However, these opportunities are accompanied by challenges such as intense competition, evolving customer expectations, and the urgent need to integrate emerging technologies into core operations (Abdul Manaf et al., 2022).

It is understood that the emerging of digital transformation (DT) delivers a critical strategy for courier companies to navigate these disruptions. Scholars emphasize that leveraging technologies such as artificial intelligence (AI), the Internet of Things (IoT), blockchain, and big data analytics that could streamline processes, reduce costs, and elevate service quality (Chen & Hu, 2021; Cywiński, 2022; University of Economics - Varna & Gramatikova, 2019). Nevertheless, successful DT implementation demands more than technological adoption; it requires a cultural and organizational shift toward innovation, agility, and customer-centricity (Gulc, 2020).

Despite ongoing progress, barriers such as organizational readiness, leadership alignment, and institutional constraints continue to hinder DT adoption, especially in emerging economies like Indonesia (Sułkowski et al., 2022). While numerous studies explore specific technologies or practices, the author identified a significant theoretical gap concerning integrated DT strategies in courier services. This paper then discusses that gap through establishment of literature review systematically (SLR) that intended to reveal dominant strategies, enabling technologies, and organizational factors which affect the field of digital transformation.

The systematic literature review (SLR) on digital transformation (DT) strategies in courier services reveals a multidimensional impact on operational efficiency, sustainability, and industry competitiveness. Digital dexterity, technology infrastructure, and a customer-centric approach are critical enablers in this transformation (Mitrsomwang & Chaikidurajai, 2025). Through technologies integration including big data, Internet of Things (IoT), artificial intelligence (AI), and autonomous vehicles, courier and logistics providers have significantly improved operational efficiency, route optimization, and customer responsiveness (Zaripova et al., 2024). Environmental and social sustainability also benefit moderately from DT adoption in supply chain processes (Junge & Straube, 2020), while organizational culture and digital innovation further enhance logistics competitiveness (Karp et al., 2024). Interestingly, the academic focus on DT in this field surged by 275% from 2020 to 2021, with European contexts dominating the discourse (Aghamiri et al., 2022). However, implementation challenges persist, particularly around leadership alignment, innovation capacity, cybersecurity, and cost management(Mvubu & Naude, 2024). The strategic transformation of logistics supply chains requires attention not only to technological adoption but also to the human and structural dimensions of change (Xiao, 2023). At a macro level, digital strategies improve investment attractiveness and sustainability within national logistics systems, contributing to broader global logistics performance (Dais et al., 2023; Palkina, 2023). In conclusion, while DT strategies in courier services demonstrate clear potential to enhance operational and strategic outcomes, the wider implications for global logistics ecosystems require further empirical investigation to bridge sector-specific insights with broader industry-level transformations.

METHOD

Research Design

A systematic literature review (SLR) is defined as structured methodology for assessing the existing research that focus particular topic, aiming to provide an unbiased summary of current understanding, identify gaps, and suggest directions for future research. This method is crucial across various fields, including healthcare, education, also social sciences, as it facilitates evidence-based decision-making and policy development (Pradana et al., 2023).

A bibliometric-based systematic literature review serves as a precious tool to map the intellectual landscape of a research field. Through the application of structured frameworks like PRISMA, this approach facilitates a thorough, methodical, and reproducible synthesis of relevant studies, providing a clear understanding towards major topics, latest studies directions, and key authors in the field (Chotisarn & Phuthong, 2025; Hadi et al., 2020).

The research applies a Systematic Literature Review (SLR) methodology, that adheres to the methodology detailed by (Tranfield et al., 2003), This paper conducted a systematic literature review (SLR) to follow the PRISMA framework which ensuring a transparent also replicable synthesis of relevant research (David Moher1,2*,Tetzlaff1, 2009) to ensure transparent reporting. To enhance the examination, bibliometric methods are used to showcase publication patterns, citation links, and thematic clusters. Bibliometrics refers to analysis techniques quantitatively of scholarly data, that leads into exploration of publication trends along with author contributions (Soumen Teli, 2015).

It serves to assess the impact of research outcomes, identify crucial elements within a discipline, and explore collaborations among authors (Blakeman, 2018). A bibliometric analysis was conducted utilizing VOSviewer, which enables the visualization of bibliographic data to examine citation networks, author collaborations, and co-occurring keywords, thus illuminating the intellectual framework and dynamics towards study domain. Through integrated analyzing of bibliometric studies that apply a systematic review assists researchers in synthesizing empirical findings and delineating the research landscape, which includes pinpointing key contributors and emerging trends (Ni & Abdullah, 2025). The software (VOSviewer) allows researchers to quickly assess the existing landscape and future directions of their research domains (Nurlaila et al., 2023).

Data Sources and Search Strategy

We searched three leading scholarly databases—Scopus.com, Publish or Peris, and Google Scholar—for studies published between 2018 and June 2025. The search strategy used Boolean combinations of terms such as:

"Courier Services" OR "courier business" OR "Courier Express Parcel (CEP)" OR "last Mile Delivery" AND "Technology" OR "Digitalization" OR "IoT" OR "AI". This paper is bounded to some of journal articles.

Inclusion and Exclusion Criteria

Inclusion criteria:

Articles in English and Open Access

Oriented into digital transformation in courier, parcel delivery, or last-mile delivery.

Empirical, conceptual, or review studies addressing technology adoption, operational innovation, or service delivery improvements.

Exclusion criteria:

Non-academic sources (e.g., trade magazines, blogs).

Studies outside the courier and logistics context.

Articles with insufficient methodological transparency.

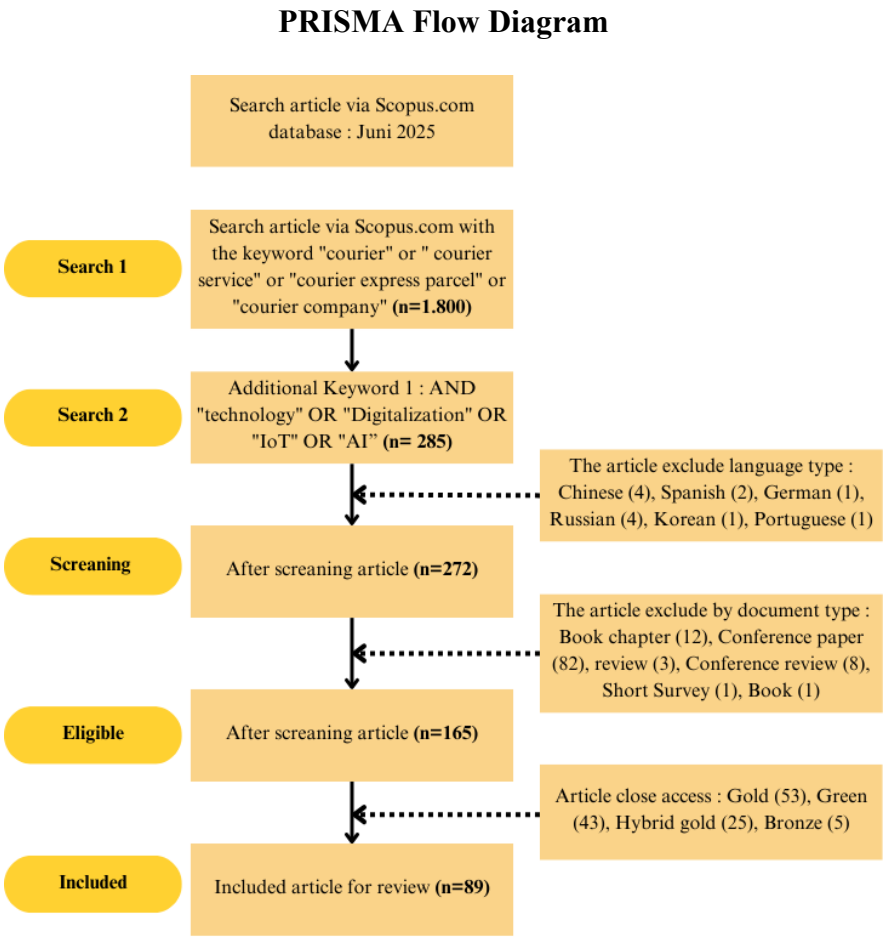

Figure 1: Systematic Literature Review Flow Using PRISMA Flow Diagram

The systematic review process began with an extensive search of the Scopus database in June 2025, yielding 1,800 articles using broad keywords such as “courier,” “courier service,” “courier express parcel,” and “courier company.” To refine the dataset, additional keywords including “technology,” “digitalization,” “IoT,” and “AI” were applied in order to filter number of relevant references into 285. During the screening stage, studies were excluded based on language, removing publications in Chinese (n=4), Spanish (n=2), German (n=1), Russian (n=4), Korean (n=1), and Portuguese (n=1), resulting in 272 articles. Further filtering was conducted to exclude unsuitable document types, eliminating book chapters (n=12), conference papers (n=82), reviews (n=3), conference reviews (n=8), short surveys (n=1), and books (n=1). This process left 165 articles for eligibility assessment. Finally, 76 articles were excluded due to restricted access types, such as gold (n=53), green (n=43), hybrid gold (n=25), and bronze (n=5) access limitations. After applying these rigorous criteria, a total 89 articles were obtained for the final review, providing a comprehensive and high-quality foundation for synthesizing insights into the digitalization of courier services. In this document study to answer further analyzed.

RQ1: To what extent does the exploration of digital transformation strategies in courier services remain a critical area for future scholarly investigation?
RQ2: How is the current body of research distributed in addressing technological advancements and strategic innovations within courier logistics?
RQ3: What theoretical frameworks and practical implications emerge from existing studies, and how can they shape the future direction of research on digital transformation in courier

services? **RQ4**: What strategies can courier services adopt to overcome the challenges of digital transformation?

RESULTS AND DISCUSSION

This research examines the output derived from 89 published scientific paper that is indexed into Scopus database pertaining to digital courier services. The information is obtained by analyzing the volume of published articles, the timeframe of publication ranging from 2018 to 2025, and the sources of journals. Furthermore, the study aims to underscore the key factors influencing digital courier services, such as authors, their affiliations, and the countries represented.

RQ1: To what extent does the exploration of digital transformation strategies in courier services remain a critical area for future scholarly investigation?

According to information gathered from the Scopus database covering the years 2018 to 2025, there exists a total of 89 open access publications focused on the digitalization of courier services. The exploration of research pertaining to digitalization in courier services has witnessed a notable increase from 2020, escalating from 7 publications in that year to 14 in 2021 in figure 2. The observed rise in research activity concerning the digitalization of courier services since 2020 which get impacted by the COVID-19 pandemic, which compelled substantial alterations in consumer behaviors and logistics operations (Czerwinska et al., 2023). The boom for e-commerce platform evidently has placed considerable pressure towards courier service providers to implement digital innovations such as parcel lockers, real-time tracking systems, and contactless delivery methods in alignment with social distancing protocols (Moritz & Parra-Gómez, 2023).

Furthermore, the pandemic has expedited many advanced technology into bond integration—specifically IoT and AI—for logistics strategies sector, including warehouse automation and route optimization, aimed at enhancing operational flexibility and resilience (Sakas et al., 2022). Consequently, the output of pandemic as external effect in conjunction towards e-commerce evolution as well as the impetus of digital technologies, serve as the primary catalysts for the heightened scholarly attention toward digital transformation within the courier services sector since 2020.

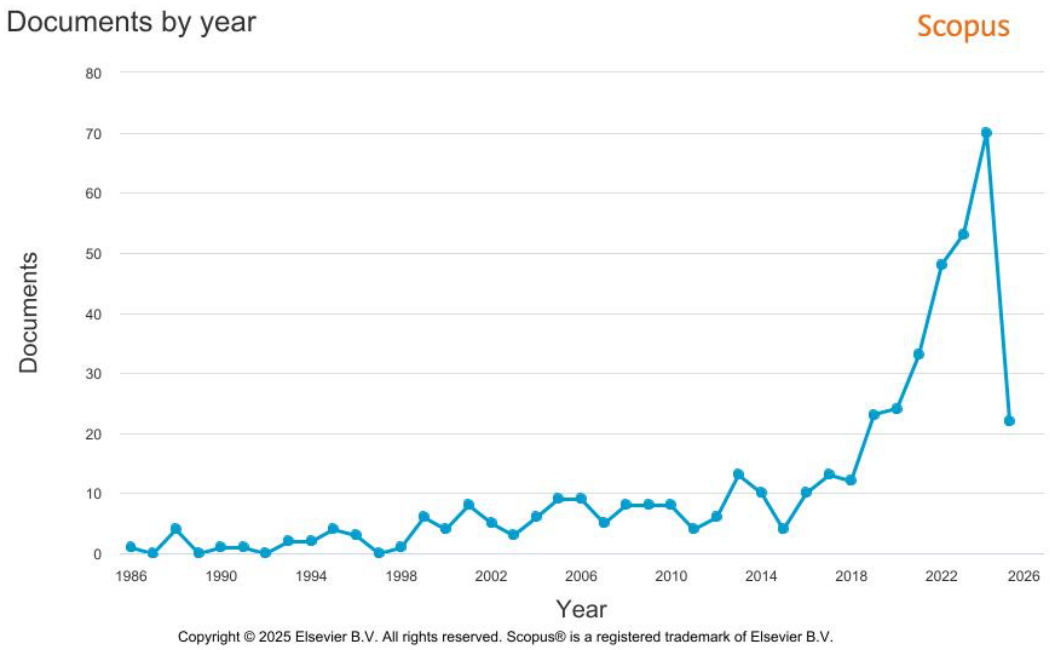

Figure 2. Number of Scopus-indexed documents on digital transformation strategies in courier services by year (1986–2025).
(Source: Scopus.com., 2025)

The distribution of documents over time reveals a significant shift in scholarly attention toward digital transformation strategies in the courier services sector. As illustrated in Figure 1, from 1986 until approximately 2015, the number of published articles remained relatively modest, with fewer than 10 documents per year. This period reflects a time when digital transformation in logistics was likely still in its nascent phase, and technological advancements had yet to strongly permeate courier operations.

However, starting around 2016, the data indicates a clear upward trend. This surge becomes particularly noticeable after 2018, where publications begin to increase sharply. The most dramatic growth occurred between 2020 and 2024, with a peak in 2024 where over 70 documents were published in a single year. This explosive rise aligns with the post-pandemic digital acceleration and the growing recognition of the courier sector's vital role in supporting e-commerce, remote services, and last-mile logistics under restrictive conditions.

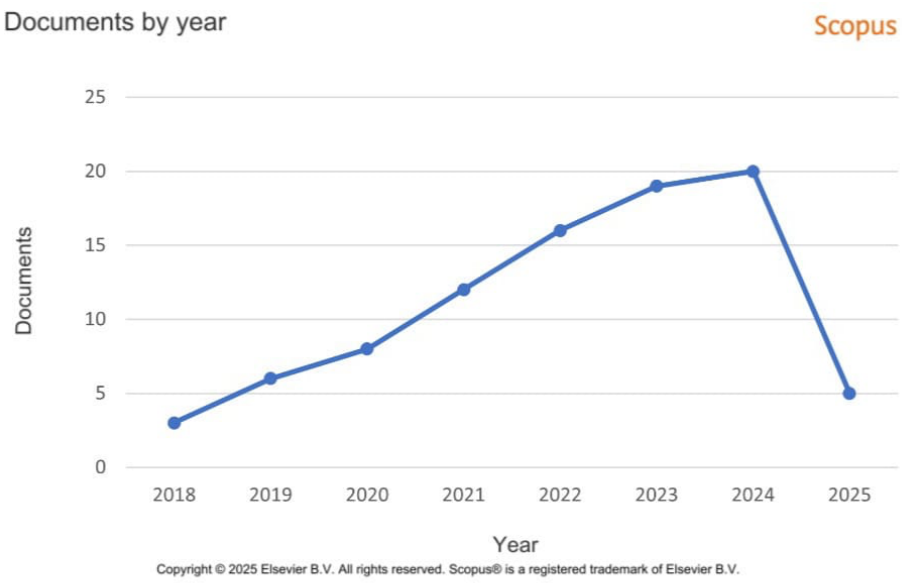

Figure 3. Documents on digital transformation strategies in courier services by year (2018–2025).
(Source: Scopus.com., 2025)

The selected literature demonstrates proven relevance and methodological rigor, this study utilized open-access journal articles indexed in Scopus published between 2018 and 2025. The selection was based on their alignment with the research theme—Digital Transformation Strategies in Courier Services—evaluated through a careful review of their titles, abstracts, conclusions, and research focus. As shown in the trend (see Figure), shortlist of relevant publications obtained steadily increased from 2018, peaking in 2024, before declining in 2025. This indicates a growing academic interest in digital transformation within the courier industry, particularly during the post-pandemic digital acceleration phase.

The publication trend from 2018 to 2025 indicates a steady increase in scholarly interest in digital transformation strategies within courier services, peaking in 2024 with the highest number of documents (around 20). This suggests a growing momentum in research addressing logistics and digital innovation, particularly in response to evolving e-commerce demands. However, a sharp decline is observed in 2025, which may be due to incomplete indexing data for the current year or a shift in research focus.

This rapid growth in scholarly output strongly suggests that digital transformation in this industry lately has been oriented centrally onto the focus of contemporary logistics research. As technology continues to evolve, the academic community appears increasingly invested in understanding, critiquing, and guiding its integration into operational and strategic practices.

RQ2: How is the current body of research distributed in addressing technological advancements and strategic innovations within courier logistics?

A comprehensive examination of the distribution of scholarly work on technological progress and strategic innovations within courier logistics was carried out by classifying 89 articles according to various criteria, including region, source, country, affiliation, and author, with a restriction to the top 10 articles in each classification. A more precise organization of academic research related to technological progress and strategic innovations in courier logistics will deliver some sources for scholars precisely as well the industry of professionalism in shaping future research directions, especially concerning the evolution of the courier sector

in response to global challenges. Initially, the categorization of academic studies pertaining to technological advancements and strategic innovations in courier logistics, sorted by country or geographic area, reveals a predominance of contributions from the United Kingdom with 13 articles, followed by China with 10 articles, the United States with 8 articles, Indonesia with 7 articles, Italy (6 articles), Poland (5 articles), and 3 country Germany, India, and Malaysia (4 articles each), along with Canada (3 articles). see figure 4

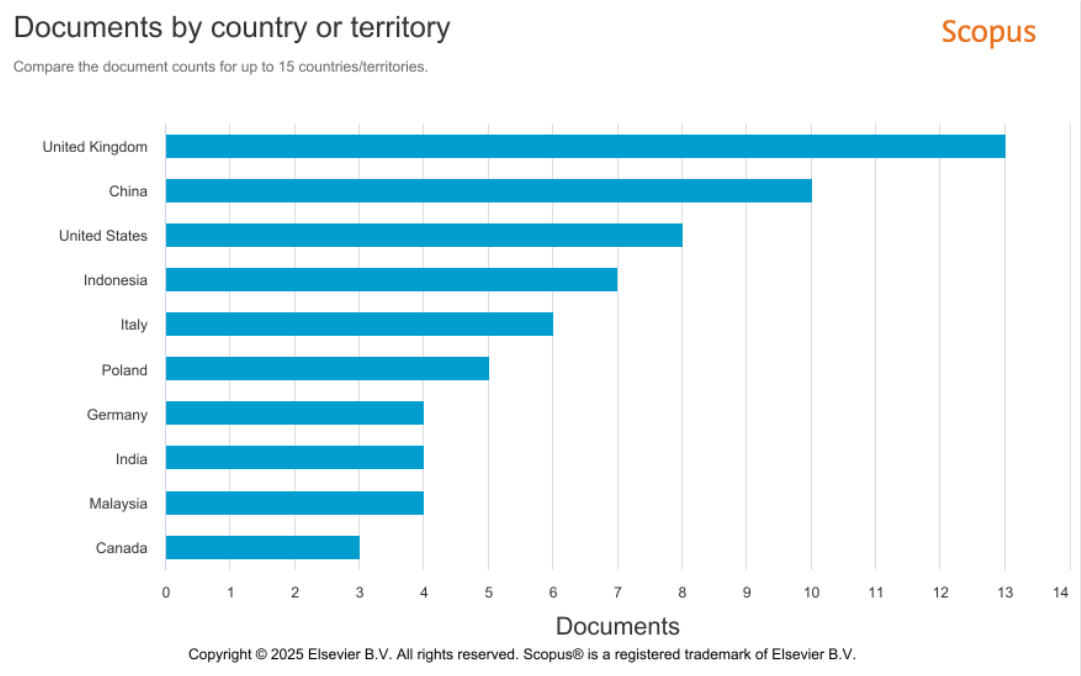

Figure 4 : Number of article by country or territory (10 Country)
(Source: Scopus.com., 2025)

To assist deeper comprehension of the global research landscape, there are following visualization maps the collaborative relationships among countries in the field. This network serves as an important lens through which we can examine patterns of co-authorship and identify key contributors driving international scholarly discourse.

The United Kingdom, China, and Indonesia emerge as central hubs within the network, suggesting their pivotal role in fostering international research partnerships. These countries exhibit strong linkages with multiple nations, underscoring their capacity to act as connectors in the global research landscape. Notably, the United States also demonstrates a prominent presence, particularly through collaborations with Germany, Indonesia, and Poland.

Clusters of countries, differentiated by colors, highlight regional and thematic collaboration trends. For example, the green cluster reflects the close cooperation between Indonesia and India, likely indicative of shared research agendas or regional priorities. Meanwhile, the purple cluster centered around China signifies its extensive collaboration with European countries such as Poland and Czech Republic. See figure 5

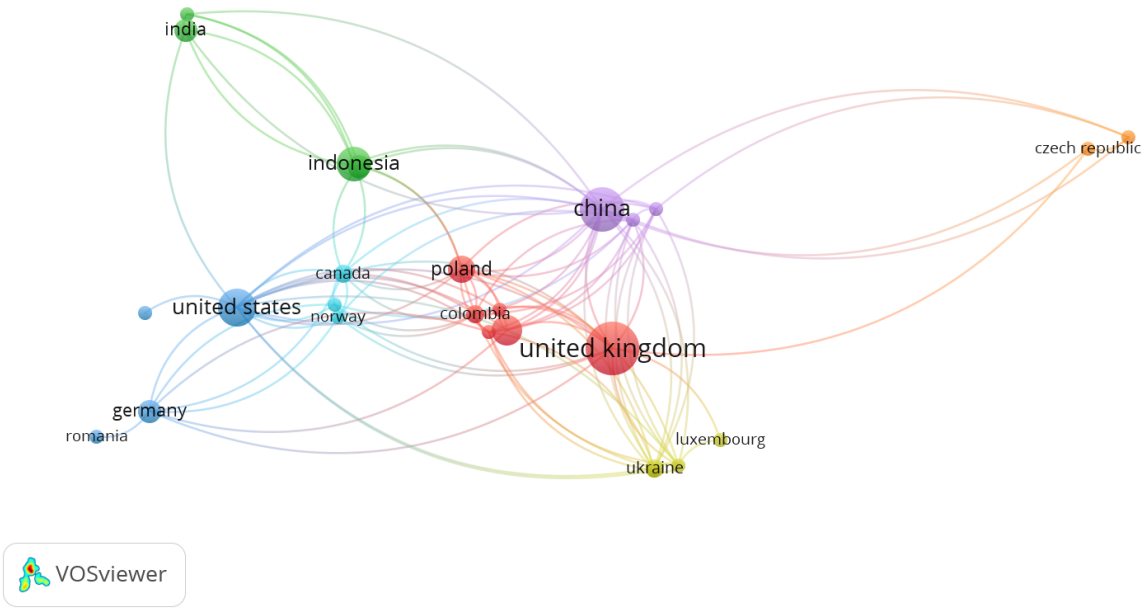

Figure 5 : Visualization network country

The visualization above presents a country co-authorship network generated through VOSviewer, illustrating the collaborative relationships among nations in scholarly publications. For every node applied to represents a country, with the size of it aimed to reflect number volume of publications or citations associated with that country. Therefore links among the nodes exlplain co-authorship fundamental strength to tie with thicker lines denoting more frequent collaborations.

This network map provides valuable insights for scholars and policymakers by identifying potential partners for cross-border research initiatives and highlighting the countries that are driving global knowledge production. Furthermore, it underscores the importance of fostering stronger ties among less connected nodes to promote a more inclusive and equitable international research ecosystem.

furthermore, the bar chart illustrates the distribution of documents by institutional affiliation, as indexed in Scopus. Among the listed affiliations, SiSaf Ltd emerges as the leading contributor with three documents, indicating its prominent role in advancing research within this domain. The remaining institutions, including Universiteit van Amsterdam, Nottingham Trent University, Jilin University, and Universiti Teknologi Malaysia, each contribute two documents, reflecting a relatively balanced level of scholarly engagement across diverse geographic regions. This distribution highlights the collaborative nature of research efforts across both academic and industrial entities, underscoring the potential for cross-institutional synergies in advancing the field further.

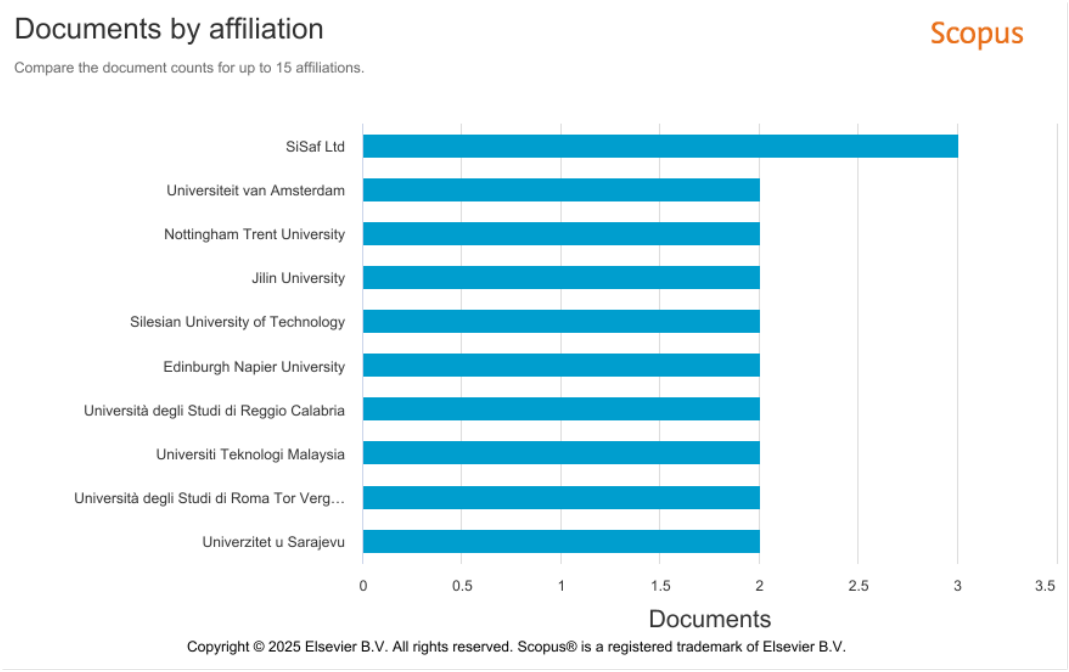

Figure 6 : Distribution of documents by institutional affiliation
(Source: Scopus.com., 2025)

To illustrate publication trends over time, the line chart presents the number of documents per year by source from 2019 to 2024. As shown in the visualization, *Sustainability Switzerland* is the most prominent source, contributing a total of 9 publications, with a peak in 2020 (3 documents) and steady outputs in 2022 and 2024 (2 documents each). Meanwhile, other journals such as *Electronics Switzerland* contributed 1 document in 2019, *Transportation Research Interdisciplinary Perspectives* provided 1 document each year from 2020 to 2024, and *Sensors* added 1 document in 2024. Additionally, *Journal of Industrial Engineering and Management* published 1 document in 2021. This pattern suggests that while research outputs are distributed across multiple journals, *Sustainability Switzerland* has emerged as a central platform for disseminating studies in this field.

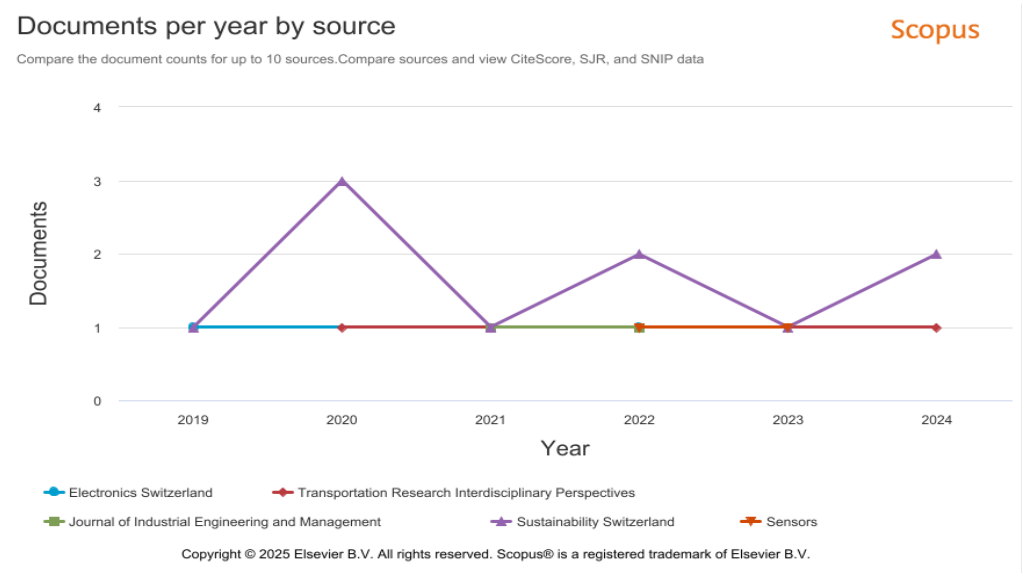

Figure 7 : Article by source (top 10)
(Source: Scopus.com., 2025)

In addition to institutional and source-level analysis, the chart above highlights the distribution of documents by author. Notably, Dehsorkhi, A., Saffie-Siebert, S., and Torabi-Pour, N. lead the list, each contributing three publications, indicating their prominent roles in advancing research within this field. Meanwhile, other authors such as Berni, R., Comi, A., and Guerriero, G. follow with two publications each, reflecting a diverse yet concentrated group of contributors driving scholarly output.

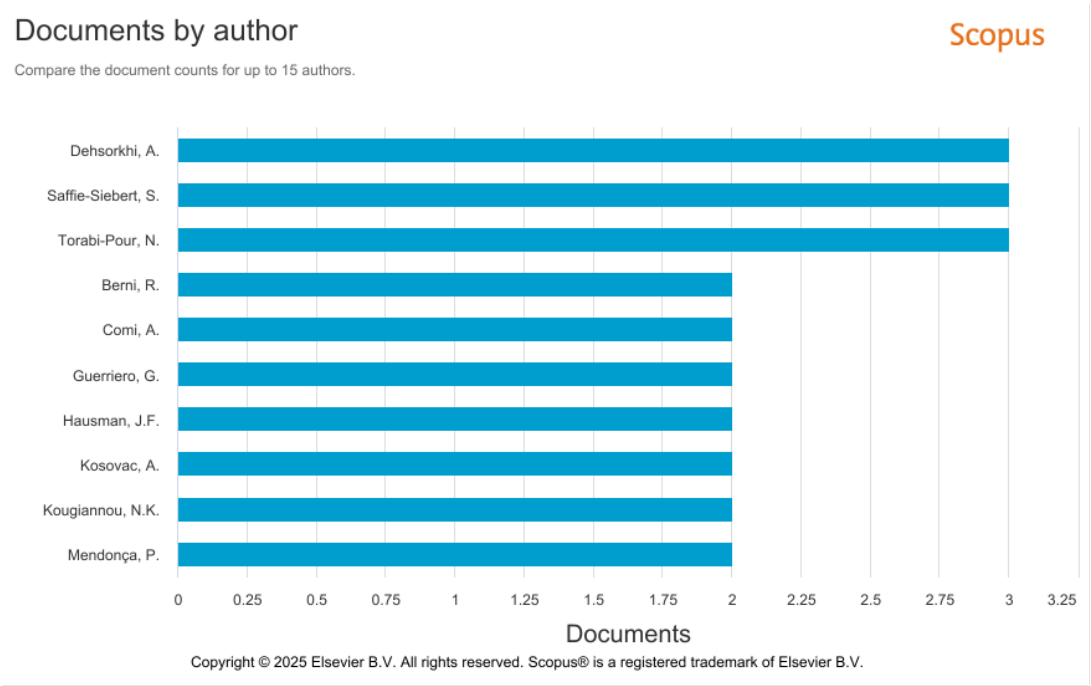

Figure 8 : Count of Publication by Author (top 10)
(Source: Scopus.com., 2025)

RQ3: What theoretical frameworks and practical implications emerge from existing studies, and how can they shape the future direction of research on digital transformation in courier services?

The examination was undertaken on 89 manuscripts amassed from the Scopus repository. VOSviewer was employed to illustrate that the findings carry both theoretical and practical ramifications for advancing digital transformation studies in the courier services field. The metadata results are analyzed using VOSviewer provide scholars and practitioners with deeper insights into the conceptual frameworks and empirical findings surrounding digital transformation. Specifically, the bibliometric analysis highlights which aspects of technology adoption, organizational agility, and customer-centric innovation have been extensively explored and which areas remain under-investigated, serving as a foundation for future inquiries (Vial, 2019). From a practitioner's perspective, these insights can guide courier service providers in implementing digital transformation strategies effectively and sustainably, thereby enhancing operational efficiency, improving customer experience, and fostering competitiveness in a rapidly evolving logistics landscape (Omar et al., 2022).

From the figure below it can be seen, the visualization above presents a keyword co-occurrence network generated using VOSviewer, which maps the thematic structure of research topic—digital transformation in logistics and courier services. The network reveals **"Logistics"** as the most prominent theme, with **9 occurrences** with numbers of validated link consisting **37**, reflect the centrality such idea under discourse. Closely connected is **"Last Mile"**, occurring **6 times** that obtain highest numbers of validated link in total is **39**,

highlighting the significance of discussion to address delivery efficiency and customer satisfaction in e-commerce and urban environments.

Additionally, "Courier Service" and "Sustainability" appear with 4 occurrences each with total validated link including 32, suggest enhanced interest to integrate environmental and operational considerations into courier operations. Other key terms include "E-Commerce" (5 occurrences, link strength 28) and **"Supply Chain"** (4 occurrences, link strength 27), emphasizing the interconnectedness of these domains in shaping delivery ecosystems. Emerging technologies such as **"Artificial Intelligence"** (4 occurrences, link strength 22) and **"Internet of Things"** (3 occurrences, link strength 16) also feature prominently, underlining their potential to drive innovation and optimization within the sector.

Overall, the keyword network demonstrates a diverse but interconnected research landscape, where technological advancements, operational strategies, and sustainability efforts converge to redefine the future of courier services and logistics management.

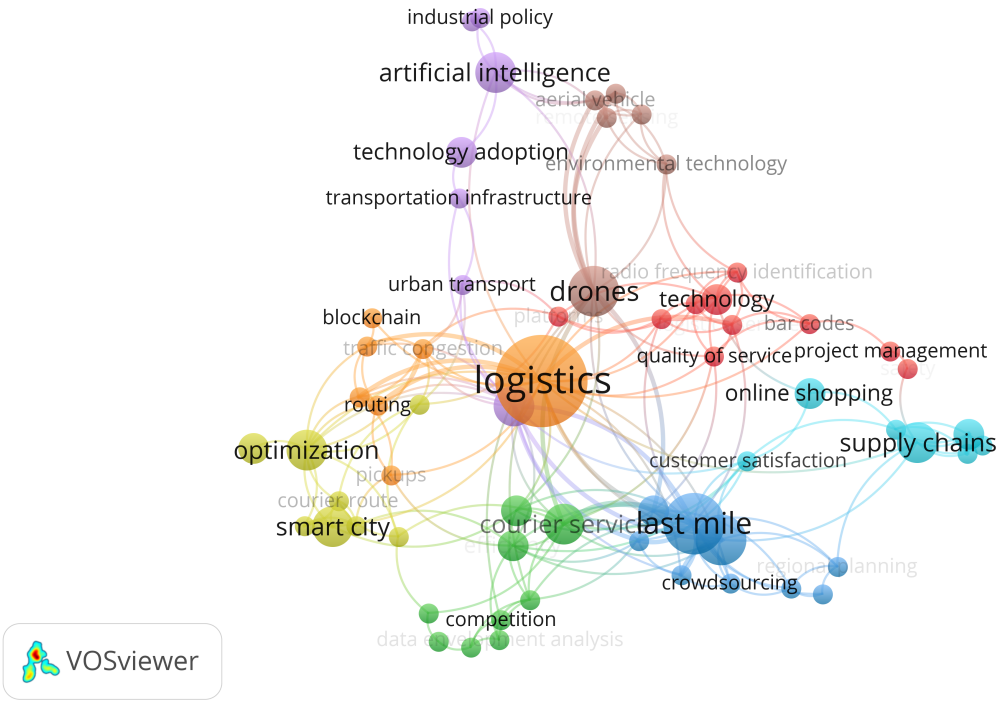

Figure 9 : Co-occurrence framework and representation of key term

Table 1. Author keyword

Rank	Keyword	Occurrences	Total link strength
1	Last Mile	6	39
2	Logistics	9	37
3	Courier Service	4	32
4	Sustainability	4	32
5	E-Commerces	5	28
6	Supply Chain	4	27
7	Artificial Intelligence	4	22
8	Cost	3	20
9	Optimization	4	19
10	Internet of Thing	3	16

The identification of these keywords provides valuable insights into the current research landscape on digital transformation in logistics and courier services. Core terms such as *"Last Mile"*, *"Logistics"*, and *"Courier Service"* reflect the central focus on improving delivery efficiency and operational performance to answer the rapid advancement of e-commerce. Meanwhile, keywords like *"Sustainability"* and *"Cost"* indicate an increasing awareness of environmental and financial considerations in designing future logistics solutions. *"Artificial Intelligence"*, *"Internet of Things"*, and *"Optimization"* concerned existence highlights the growing influence of advanced technologies in transforming traditional courier systems into smarter, more agile networks. These findings not only map the dominant themes but also reveal underexplored areas that could inspire future research directions. By understanding these interconnected topics, scholars and practitioners can develop robust theoretical frameworks and practical innovations that shape the evolution of courier services in a highly competitive and digitally-driven landscape.

RQ4: What strategies can courier services adopt to overcome the challenges of digital transformation?

This study used peer-reviewed Scopus-indexed sources to conduct a systematic literature review (SLR) to gain a deeper understanding of the strategic role of digital transformation (DT) in shaping the courier and logistics industry. The review was motivated to increase Courier, Express, and Parcel (CEP) complexity sector, especially in light of the rapid integration of emerging technologies where e-commerce is continuously growing, and consumer orientation is shifting. Map dominant themes, identify enabling technologies, and evaluate the organizational and systemic ramifications of digital transformation in courier services by looking at a wide range of academic publications from 2018 to 2025 as many as 89 articles.

Several studies have highlighted the strategic significance of DT in courier operations as a means of bridging the gap between present industry practices and upcoming innovations. (Masa'deh et al., 2024) found 34 strategic benefits of blockchain that align the industry with Industry 4.0 by improving sustainability, efficiency, and transparency. Similar to how (Prapinit et al., 2024) emphasized how IoT is potentially to increase customer satisfaction and supply chain sustainability through real-time insights, (Botsane et al., 2019) emphasized urgency to lean for improving improve operational performance. Together, these observations demonstrate how technology is revolutionizing logistics procedures and enhancing long-term competitiveness. Next section further would provide athematic synthesis of the reviewed literatures to shed light on the developments, tactics, and trends influencing the courier industry's future.

Table 2 : Result of analysis article

No	Title	Author	Concise Conclusion
1	"The-Blockchain-Effect-On-Courier-Supply-Chains-Digitalization-And-Its-Contribution-To-Industry-40-Within-The-Circular-Economy"	(Masa'deh et al., 2024)	Blockchain enhances logistics transparency, efficiency, and sustainability, offering 34 strategic benefits that support 4.0 era with digital transformation.
2	"The Collection-And-Delivery Points Implementation Process From The."	(Zenezini et al., 2018)	While CDP implementation in Italy shows promise in reducing delivery costs, high adoption barriers and customer preference for human interaction remain key challenges.
3	"Smart-Logistics sustainable-Technological-Innovations-In-Customer-Service-At-The-Lastmile-Stage-The-Polish-Perspective."	(Kolasińska-Morawska et al., 2022)	Smart and eco-friendly logistics innovations are essential to enhance customer service while reducing environmental impact.
4	"Smart-Home-Devices-And-B2C-Ecommerce-A-Way-To-Reduce-Failed-Deliveries"	(Seghezzi & Mangiaracina, 2023)	By integrating customer presence data, the proposed model significantly reduces missed B2C deliveries and outperforms traditional methods, offering both academic and managerial value for last-mile logistics.
5	"Simulation-Based Algorithm For Determining Best Package Delivery."	(Rajendran & Harper, 2021)	A simulation algorithm supports the rise of instant delivery, prompting future research on multi-package and emerging logistics technologies.
6	"Service Quality Improvement In Courier Service Need For Lean Principles."	(Botsane et al., 2019)	Lean principles offer transformative, cost-effective strategies to enhance operational efficiency in the courier sector, warranting further research and broader adoption.
7	"Route Planning For Last-Mile Deliveries Using Mobile Parcel."	(Liu et al., 2023)	The proposed HQM approach for MPLP outperforms existing methods in efficiency and delivery success, offering managerial insights while highlighting the need for further practical integration studies.
8	"Review Of Policy Research - 2023 - Chou - Politics Of On-Demand Food Delivery Policy Design And The Power Of Algorithms."	(Chou & Gomes, 2023)	While algorithmic technologies enhance efficiency, they also introduce labor risks and social disparities, highlighting the urgent need for policy reformed to contribute for on-demand food delivery field.
9	"Reverse Logistics Uncertainty in a Courier industry a triadic model."	(Wang et al., 2021)	The study introduces a triadic model for reverse logistics uncertainties, underscoring sustainability and the need to explore key uncertainty types.

10	"Research-on-an-Algorithm-of-Express-Parcel-Sorting-Based-on-Deeper-Learning-and-MultiInformation-Recognition."	(Xu et al., 2022)	A multi-information fusion method enhances the accuracy and robustness of courier sheet recognition, despite reduced processing speed.
11	"Requirements-for-the-Transformation-towards-Returnable-Transport-ItemEnabled-Circular-Economies-in-the-Austrian-Parcel-Industry_2024_University-North."	(Schneikart et al., 2024)	In order to achieve circular economy particularly for parcel industry requires strategic, cultural, and regulatory alignment, with stakeholder commitment to innovative RTI solutions.
12	"REDTag_A_Predictive_Maintenance_Framework_for_Parcel_Delivery_Services."	(Proto et al., 2020)	Machine learning and big data frameworks show promise for predictive maintenance in courier logistics, with Gradient Boosting delivering strong performance.
13	"Psychological health correlation of express delivery workers' occupational stress in the information logistics environment"	(Lin, 2022)	E-commerce growth increases courier stress risks, with age and gender influencing mental health outcomes requiring further investigation.
14	"Proposed Customer-Based Brand Equaty (CBBE) Strategy for Railway Courier Service-Case Study Rail Express of PT KAI."	(Rahman & Garnida, 2021)	The study proposes a CBBE-based strategy to address Rail Express's low brand awareness, emphasizing marketing mix improvements and future research on effectiveness.
15	"Comparison of courier companies in Slovakia in the context of sustainable development"	(Repková-Štofková et al., 2023)	The study highlights the importance for connecting sustainability and courier strategies as one to achieve efficient and ethical last-mile delivery in the urbanized society as well as e-commerce growth.
16	"Playing in Traffic? Exploring the Intersection of Platforms, Agency, and Space in Bicycle Courier Mobilities"	(Sikora, 2024)	The study highlights how algorithmic spatial control shapes bicycle courier work, revealing tensions between efficiency-driven routing and courier agency in urban environments.
17	"Pickup and delivery costs- A proposed outsourcing model based on the number of stops"	(Kosovac & Muharemovic, 2021)	The study offers a stop-based cost mechanism to oursource courier services, highlighting its role in efficient cost management and suggesting further research on route-specific metrics.
18	"Perceived-Importance-and-Quality-Attributes-of-Automated-Parcel-Locker-Services-in-Urban-Areas"	(Cieśla, 2023)	The study uses the Kano model to identify key service attributes of parcel lockers, highlighting user expectations and enriching the literature on self-

			service technologies in last-mile delivery.
19	"Parcel-Classification-and-Positioning-of-Intelligent-Parcel-Storage-System-Based-on-YOLOv5"	(Kim & Kim, 2022)	YOLOv5l demonstrates superior performance in parcel box recognition, making it well-suited for intelligent storage systems.
20	"Odds stacked against workers: Datafied gamification on Chinese and American food delivery platforms"	(van Doorn & Chen, 2021)	This study reveals how gamification reinforces algorithmic labor control in platform capitalism, with cross-city insights and implications for future labor practices.
21	"New-express-delivery-service-and-its-impact-on-CO2-emissions"	(Lazarevic et al., 2020)	The presented "post express nonstop" service meets user demand, supports market readiness, and offers environmental benefits, notably a 26% CO_2 reduction.
22	"Multi Stakeholder perspective of courier services quality B2C E Commerce."	(Gulc, 2021)	This study presents correlational model for courier service feature in e-commerce, emphasizing efficient order processing and multi-stakeholder insights to guide quality improvement efforts.
23	"Mapping-the-Landscape-of-Independent-Food-Delivery-Platforms-in-the-United-States_2024_Association-for-Computing-Machinery."	(Liu et al., 2024)	Indie food delivery platforms rely on customizable technologies and community focus, highlighting the need for tailored solutions and further research on their unique technological challenges.
24	"Managing-COVID19-disruption-the-response-of-express-couriers-and-lessons-learned-to-improve-resilience."	(Garola et al., 2023)	The study shows that adapting key resources—personnel, digital tools, and communication—enhances operational resilience in express couriers post-pandemic.
25	"Last-Word-in-LastMile-Logistics-A-Novel-Hybrid-MultiCriteria-DecisionMaking-Model-for-Ranking-Industry-40-Technologies."	(Veljović et al., 2024)	A hybrid MCDM model supports strategic selection in the 4.0 industrial revolution by evaluating their advantages and challenges across complex logistics contexts.
26	"Last-Mile-Logistics-Innovations-in-the-CourierExpressParcel-Sector-Due-to-the-COVID19-Pandemic."	(Sułkowski et al., 2022)	The study confirms that technological innovations driven by customer experience are vital for advancing last-mile logistics in the post-pandemic CEP industry.

27	"Designing courier service (Jastip) application by using spark-based big data technology"	(Dessi et al., 2019)	StealDeal is a mobile application prototype designed with Spark-based Big Data architecture to support the Jastip service model by recommending discounted products from Japanese websites.
28	"International Experience in the Development of Electronic Commerce and Its Application in the Republic of Belarus"	(Dina & Veronika, 2022)	E-commerce manifest the main alsodriver of efficiency, competitiveness, and market expansion in Belarus, supported by digital trends and liberalization strategies.
29	"Interactive-System-for-Package-Delivery-in-Pedestrian-Areas-Using-a-SelfDeveloped-Fleet-of-Autonomous-Vehicles."	(Kocsis et al., 2022)	Enhancing autonomous delivery systems requires safe, intuitive vehicle behavior, stakeholder integration, and mission-aligned path planning to boost public acceptance and operational effectiveness.
30	"Intelligent-Logistics-Express-Parcel-Realtime-Detection-System-Based-On-Improved-Yolov8_2025_Silesian-University-Of-Technology."	(Gao et al., 2025)	The YOLOv8n-SCS-CE model offers efficient, high-precision parcel detection with reduced complexity, making it ideal for embedded logistics applications.
31	"Innovations-of-Express-Companies-Adoption-of-Protective-Wearable-Artificial-Intelligence-Devices-by-Couriers."	(Sun et al., 2024)	WAI devices improve courier safety and efficiency, support sustainability, and require training, user-focused design, and policy support for effective adoption.
32	"Innovations in last mile logistics - analysis of customer satisfaction with the service of delivery logistics operators using parcel machines"	(Brzozowska, Brzozowska, et al., 2023)	Technological innovation and customer feedback are key to enhancing logistics service satisfaction, especially amid evolving post-pandemic consumer behavior.
33	"Infrastructuring-platform-delivery-work-exclusions-coercions-and-resistance-in-delivery-platforms-migrant-work-in-Bogot-Colombia."	(Yohanna Sánchez et al., 2024)	The study reveals how Venezuelan migrant couriers in Colombia face coercion and exclusion within precarious platform labor, exposing broader dynamics of inequality.
34	"Promotional Pricing Strategy, Brand Image, and Brand Ambasassadorship of A Company on Customer Intention to Transaction for Coourier Service."	(Aisah, 2024)	Brand image and promotional pricing significantly influence customer transaction interest in courier services, while brand ambassadors have minimal impact on company selection.
35	"Improving-last-mile-distribution-systems-through-the-Internet-of-Things-a-South-African-case."	(Kafile & Mbhele, 2023)	Output of this research study confirms IoT's positive impact towards efficient cost and qualified service in logistics, urging strategic investment and

			innovation for enhanced last-mile performance.
36	"Identities-and-Precariousness-in-the-Collaborative-Economy-Neither-WageEarner-nor-SelfEmployed-Emergence-and-Consolidation-of-the-Homo-Rider-a-Case-Study."	(López-Martínez et al., 2022)	The study reveals how platform work reshapes labor identity into a hybrid form, challenging traditional employment categories and sparking ongoing legal and ideological debates in Europe.
37	"Ideal-Location-Selection-For-Contactless-Parcel-Pickup-Points."	(Tuncali Yaman & Yaylalı, 2023)	Kadikoy, Umraniye, and Atasehir are optimal PPP locations in Istanbul, identified via a hybrid fuzzy method.
38	"Idea selection of new services for courier business the opportunity of data analysics."	(Jintana et al., 2021)	The study proposes three DA-based service models for courier firms, identified through SWOT, Gap, and Ansoff analyses.
39	"Freight-demand-and-supply-assessment-for-implementation-of-crowdsourcing-technology-A-case-study-in-Bratislava-Slovakia."	(Galkin et al., 2021)	This study offers a first assessment of crowd shipping demand in Bratislava, highlighting sociodemographic influences and the need for localized planning methodologies.
40	"Exploring-the-Risks-of-Green-Crowdsourcing-in-South-Africa-The-Case-of-Dilivari."	(Okoche et al., 2024)	Green crowdsourcing apps improve sustainability in last-mile logistics but are hindered by multidimensional risks, requiring robust policy and regulatory responses.
41	"Exploring the Influence of Digital Model Business Innovation Factors on the Courier Service Company's Sustainability Innovation Performance."	(Charles Sitorus et al., 2022)	Dynamic delivery and adaptive management boost digital business model innovation, reinforced by digital maturity.
42	"Evaluation-of-Auricular-Morphologies-of-Motorcycle-Couriers-Based-on-Helmet-Usage-Using-Photogrammetric-Methods."	(Erdogan et al., 2024)	Prolonged helmet use causes auricular changes and may increase hearing loss risk in motorcycle couriers, with ethnic variation as a contributing factor.
43	"Evaluation-and-improvement-of-the-efficiency-of-logistics-companies-with-data-envelopment-analysis-model."	(Lee et al., 2021)	Only 27.88% of Malaysian logistics companies are efficient; the study recommends benchmarking for improvement and offers a replicable framework for other contexts.

44	"Environmental-Burden-Case-Study-of-RFID-Technology-in-Logistics-Centre."	(Bukova et al., 2023)	RFID utilization for logistics sector generates substantial e-waste, prompting a need for recycling and sustainable disposal to align with growing environmental awareness.
45	"Enhanced Technology for Logistics Courier Delivery Using RFID."	(Novitasari & Anwar, 2022)	RFID and Anti-Collision Algorithms significantly reduce courier processing time by 74%, improving efficiency and addressing pre-delivery inefficiencies.
46	"Emerging Information and Communication Technologies: the Challenges for the Dynamic Freight Management in City Logistics"	(Comi & Russo, 2022)	Emerging ICTs enhance city logistics by optimizing actor interactions, modifying path costs, and highlighting the need for integrated logistics systems and generalized load management.
47	"Drones for automated parcel delivery: Use case identification and derivation of technical requirements"	(Zieher et al., 2024)	Truck-drone tandem systems significantly boost last-mile delivery efficiency, but require airspace coordination and strategic deployment to meet urban logistics demands.
48	"Drone-as-a-Service for last-mile delivery Evidence of economic viability."	(Filiopoulou et al., 2025)	Drone-as-a-Service offers a financially superior model for last-mile delivery, enabling organizations to benefit from high ROI and NPV without direct asset ownership.
49	"Do-I-need-to-use-it-Factors-influencing-the-intention-to-adopt-automated-parcel-lockers-as-lastmile-delivery-services."	(Yusoff et al., 2023)	The key driver for parcel locker adoption is understood as performance expectancy, it is mediating the limited role of social influence and highlighting the need for improved functionality to boost usage.
50	"Digital Transformation in the Transportation and Logistics."	(Kurniadi, 2025)	Digital transformation enhances efficiency, transparency, and innovation in logistics through IoT, AI, and blockchain, supporting Indonesia's competitiveness despite infrastructure and workforce challenges.
51	"Determinants-of-efficient-lastmile-delivery-evidence-from-health-facilities-and-Kaduna-Health-Supplies-Management-Agency."	(Miko & Abbas, 2024)	Key factors including cost, time, mode, and technology positively influence last-mile delivery efficiency, while product mix hinders it—informing improvements in Nigeria's health supply chain.
52	"Determinants-of-adopting-eCourier-services-the-moderating-role-of-resistance-to-change."	(Gani et al., 2024)	eCourier adoption fosters service industry digitization and workforce readiness in developing countries, offering key insights from Bangladesh to guide broader implementation.

53	"Data envelopment analysis for Malaysia courier services performance and customer satisfaction"	(Teoh et al., 2020)	The study reveals customer satisfaction rankings among courier services in Hulu Terengganu, with Poslaju leading and GD Express lagging, using Data Envelopment Analysis to inform service improvement.
54	"Data-Culture-the-Obstacle-to-SMART-Customs-in-the-Face-of-Disruptive-Innovations--a-Jamaican-Perspective."	(Smith, 2023)	SMART Customs adoption requires modern systems, strong data culture, and stakeholder awareness amid global trade challenges.
55	"Courier Service Application Courier Service Quality and Customer Loyality Mediated by Customer Experience and Customer Satisfaction."	(Hamidin & Hendrayati, 2022)	Courier service quality significantly influences customer loyalty via experience and satisfaction, as confirmed through the CSL model using quantitative analysis.
56	"Courier Dispatch in On-Demand Delivery."	(Chen & Hu, 2021)	The model effectively represents low-order delivery systems and guides operational decisions in emerging markets, though further data-driven insights and courier behavior studies are needed.
57	"Cost-and-performance-optimisation-in-the-technological-phase-of-parcel-delivery--a-literature-review."	(Muharemović et al., 2021)	The study reveals delivery optimization gaps, tech integration issues, and the need for quality-driven parcel services.
58	"Corporate Strategy and Tactics of SF Express in Domestic and International Courier Market"	(S.M. Yuen & Yu, 2019)	The study emphasizes SF's need to expand globally, diversify services, and transition toward integrated logistics, highlighting strategic challenges and the importance of managerial support.
59	"Competition on the courier, express and postal services market."	(Sikora, 2024)	E-commerce evolution, accelerated by technology and COVID-19, reshaped Poland's courier market. InPost led with innovation, while shifting customer preferences pushed firms to enhance service quality and adapt.
60	"Comparison of in-sight and handheld navigation devices toward supporting."	(van Lopik et al., 2020)	Wearables must outperform smartphones to optimize last-mile delivery amid GPS limitations, enhancing courier safety and task accuracy.
61	"City logistics Towards a blockchain decision framework for collaborative."	(Hribernik et al., 2020)	The study proposes a practical blockchain mechanism to collaborate CEP in micro-hubs, enhancing data flow, automation, and fostering future city logistics research.

62	"Causal factors of digital transformation affecting the business operations in courier service."	(Mitrsomwang & Chaikiduraj ai, 2025)	Digital transformation, driven by technology and customer focus, enhances courier service competitiveness despite challenges like delays and high costs, with innovation and digital dexterity as key enablers.
63	"A decision support system for logistics performance evaluation of courier company"	(Khan et al., 2020)	Output of the research suggest a Fuzzy-AHP-based decision support system prototype to enhance logistics performance evaluation by integrating managerial knowledge and experience.
64	"Barriers-and-Strategies-for-Digital-Marketing-and-Smart-Delivery-in-Urban-Courier-Companies-in-Developing-Countries."	(Boom-Cárcamo et al., 2024)	Urban courier firms should adopt social media and smart delivery solutions to enhance digital marketing, meet evolving customer needs, and strengthen market positioning.
65	"A-Study-on-the-Use-of-the-PhytoCourier-Technology-in-Tobacco-Leaves-Infected-by-Agrobacterium-tumefaciens."	(Gutsch et al., 2023)	GS3 with quercetin-loaded sshLNPs boosts antioxidant defense and stress tolerance, supporting agricultural resilience.
66	"Assessing-the-Impacts-of-Crowdshipping-Using-Public-Transport-A-Case-Study-in-a-MiddleSized-Greek-City."	(Karakikes & Nathanail, 2022)	Crowdshipping enhances urban freight sustainability, especially with smart lockers, though benefits depend on adoption scale and implementation strategy.
67	"Artificial-intelligence-powered customer service management in the logistics industry"	(Brzozowska, Kolasińska-Morawska, et al., 2023)	AI is reshaping logistics customer service through automation, demanding digital competence and education to optimize human-AI collaboration.
68	"Development of android-based apps for courier service management"	(Mohd et al., 2019)	This study presents an Android-based courier management application with last mile route tracking, optimizing parcel delivery through real-time navigation and customer notification using Google Maps API.
69	"A-Nexus-Between-Green-Intelectual-Capital-Supply-Chain-Integration-Digital-Supply-Chain-Supply-Chain-Agility-and-Business-Performance."	(Muafi & Sulistio, 2022)	GIC positively influences supply chain consolidatipn, digital supply chains, also business performance, though limited digital literacy highlights the need for ongoing training and expanded future research.
70	"A-nexus-between-green-HRM-GHRM-supply-chain-performance-Scp-and-business-performance-BP-The-mediating-role-of-supply-chain-organizational-learning-Scol."	(Kusumawati, 2021)	SCOL positively impacts supply chain and business performance which mediate their relationship, while GHRM shows no effect; the findings underscore the importance of digitalization and green innovation despite sampling limitations.

71	"A-new-approach-to-comparison-of-CEP-service-providers-using-ordinal-priority-method."	(Čačić et al., 2024)	Financial sustainability influences customer preference in CEP services; using financial ratio analysis and the OPA method, the study ranks providers and supports regulatory performance evaluation.
72	"Analysis-and-Research-on-Intelligent-Logistics-Data-under-Internet-of-Things-and-Blockchain."	(Li, 2024)	The proposed model improves logistics transaction traceability with secure, low-latency data transmission and reduced energy consumption, enhancing overall network efficiency.
73	"Analysis of the Performance of Courier Companies in Selected Listed Counters in Malaysia."	(Abdul Manaf et al., 2022)	Efficient asset and logistics management significantly enhance courier company profitability, with implications for stakeholders and future cross-country research.
74	"An Integrated Couried Services Application A New User Experience."	(Mahamad et al., 2018)	The Parcel2Go app improves courier service flexibility and user convenience through price comparison and intuitive design, garnering positive user feedback.
75	"Ambulatory blood pressure monitoring using."	(Armitage et al., 2022)	Remote ABPM via video and courier services is feasible, safe, and enhances healthcare accessibility, especially during pandemics, despite presentation limitations.
76	"Algorithmic-management-wellbeing-and-platform-work-understanding-the-psychosocial-risks-and-experiences-of-food-couriers-in-Finland."	(Mbare et al., 2024)	Algorithmic management contributes to psychosocial hazards for food delivery couriers; regulatory interventions and union involvement are vital to improve work conditions.
77	"The_Relationship_between_Human_Resource_Management_Practices_and_Job_Performance_in_the_Courier_Service_Industry."	(Hee et al., 2019)	Employment security and training significantly improve job performance amidst industrial field of courier, while compensation and benefits show minimal influence.
78	"Urban-Courier-Delivery-in-a-Smart-City-The-User-Learning-Process-of-Travel-Costs-Enhanced-by-Emerging-Technologies."	(Russo & Comi, 2023)	Emerging ICTs and a two-layer optimization model significantly improve courier routing efficiency, reduce costs, and support sustainable urban logistics.
79	"Understanding-the-Challenges-Facing-Decarbonization-in-the-ECommerce-Logistics-Sector-in-Latin-America."	(Jurburg et al., 2023)	Decarbonization efforts in Latin American e-commerce logistics remain limited, highlighting the need for broader engagement and further research.
80	"Understanding-customers-adoption-of-express-delivery-	(Zhong et al., 2022)	Delivery reliability significantly drives express delivery adoption, while speed, effort expectancy, and facilitating

	service-for-lastmile-delivery-in-the-UK."		conditions show limited or negative influence, offering fresh insights for service promotion.
81	"Trust-in-courier-services-and-its-antecedents-as-a-determinant-of-perceived-service-quality-and-future-intention-to-use-courier-service."	(Ejdys & Gulc, 2020)	Pandemic-driven e-commerce growth feature trust and technology of courier service adoption urgency, offering insights for policymakers despite sampling and scope limitations.
82	"Toward a large-batch manufacturing process for silicon-stabilized lipid nanoparticles: A highly customizable RNA delivery platform."	(Saffie-Siebert et al., 2024)	Silicon-stabilized hybrid lipid nanoparticles (sshLNPs) enhance RNA stability, enable scalable production, and support customizable therapeutics, promoting clinical translation readiness.
83	"Citizen-rentier-ship: Delivering the Undocumented to Labour Platforms in Paris"	(Baril, 2024)	Labour and migration policy reforms are essential to address the structural precarity and misclassification affecting Paris' delivery workers.
84	"Paying for free delivery: dependent self-employment as a measure of precarity in parcel delivery"	(Moore & Newsome, 2018)	The rise of dependent self-employment in parcel logistics reflects cost-cutting strategies that transfer risks to workers, highlighting the need for legal reforms to address perilous and control for giant economy.
85	"Informalization in gig food delivery in the UK : The case of hyper-flexible and precarious work"	P Mendonca, Nadia K. Kougiannou, I Clark	The study concludes that platform companies contribute to the informalization of gig work, accelerating the expansion for hyper-precarious environment framed in the food delivery sector.
86	"Breaking the Managerial Silencing of Worker Voice in Platform Capitalism: The Rise of a Food Courier Network"	(Kougiannou & Mendonça, 2021)	Food couriers resist managerial silencing through varied voice strategies, with technology shaping both opportunities and limits for expression.
87	"Towards privatized social and employment protections in the platform economy? Evidence from the UK courier sector"	(Rolf et al., 2022)	Platform capitalism drives privatization for social protections amid regulatory gaps, challenging UK employment law while offering both risks to worker rights and new roles for trade unions.
88	"IoT in Courier Services: Impact on Customer Satisfaction and Supply Chain Sustainability"	(Prapinit et al., 2024)	IoT enhances efficient of courier service as well as sustainability, but real-time data must be carefully managed to avoid negative impacts; future studies should deepen understanding of IoT dynamics.

89	"Customer's Adoption Intentions toward Autonomous Delivery Vehicle Services: Extending DOI Theory with Social Awkwardness and Use Experience"	(Lu et al., 2023)	Multiple psychological and contextual factors shape customers' intentions to adopt ADVs, offering insights for policy development on regulation and standardization.

Table 2 presents the titles, authors, and summarized conclusions of the 89 research articles reviewed, revealing a consistent pattern in their findings. This thematic consistency highlights the analytical strength of the Systematic Literature Review (SLR) method, particularly in identifying convergence across a broad set of studies. Rather than relying solely on keyword matching, the classification of articles into four strategic categories—**Investing in Digital Culture**, **Building Robust Technological Infrastructure**, **Securing Financial Resources**, and **Regulatory Compliance and Engagement**—was guided by a rigorous thematic synthesis approach.

We examined author-reported keywords and thematic cues found in the ***Conclusions***, ***Results***, ***Research Gap***, ***Future Research***, **and** ***Research Focus*** **sections** of each article. The categorization criteria were derived from recurrent patterns in these sections, including the following thematic keywords:

- **Investing in Digital Culture**: training, digital literacy, employee readiness, organizational change, cultural transformation, digital mindset.
- **Building Robust Technological Infrastructure**: platform development, IoT, system integration, AI, automation, route optimization, real-time tracking.
- **Securing Financial Resources**: cost-benefit analysis, investment planning, funding models, financial risk, budgeting, digital project financing.
- **Regulatory Compliance and Engagement**: policy alignment, government support, standards compliance, legal frameworks, data protection, regulation impact.

These keyword clusters served as guiding indicators for assigning each article to its most representative strategic domain. For example, studies emphasizing workforce preparedness and digital upskilling **(Dessi et al., 2019; Mohd et al., 2019)** were placed under "Investing in Digital Culture," while those focusing on IoT deployment or platform development **(Galkin et al**., 2021; Khan et al., 2020) were categorized under "Building Robust Technological Infrastructure." Studies centered on financial feasibility and funding strategies **(Armitage et al., 2022)** fell into "Securing Financial Resources," whereas research addressing regulatory challenges **(Teoh et al., 2020)** were grouped under "Regulatory Compliance and Engagement."

This classification process ensures interpretative depth and thematic coherence across a broad literature base, reinforcing the internal validity of our SLR and offering a structured roadmap for academic and industry stakeholders to navigate digital transformation strategies in the courier sector.

Tabel 3 : Strategy Category

No	Strategy Category	Referencee	Amount
1	Investing in digital culture	(Brzozowska, Kolasińska-Morawska, et al., 2023; Comi & Russo, 2022; Erdogan et al., 2024; Garola et al., 2023; Hamidin & Hendrayati, 2022; Hee et al., 2019; Kolasińska-Morawska et al., 2022; Kougiannou & Mendonça, 2021; Kusumawati, 2021; Lin, 2022; Liu et al., 2023; Mbare et al.,	21=16%

		2024; Moore & Newsome, 2018; Muafi & Sulistio, 2022; "Promotional Pricing Strategy, Brand Image, and Brand Ambassadorship of a Company on Customer Intention to Transaction for Courier Services," 2024; Proto et al., 2020; Sun et al., 2024; van Doorn & Chen, 2021; van Lopik et al., 2020; Xu et al., 2022; Zhong et al., 2022)	
2	Building robust technological	(Armitage et al., 2022; Baril, 2024; Boom-Cárcamo et al., 2024; Botsane et al., 2019; Brzozowska, Brzozowska, et al., 2023; Bukova et al., 2023; Charles Sitorus et al., 2022; Chen & Hu, 2021; Chou & Gomes, 2023; Cieśla, 2023; Comi & Russo, 2022; Dessi et al., 2019; Dina & Veronika, 2022; Filiopoulou et al., 2025; Galkin et al., 2021; Gani et al., 2024; Garola et al., 2023; Gulc, 2021; Gutsch et al., 2023; Jurburg et al., 2023; Kafile & Mbhele, 2023; Karakikes & Nathanail, 2022; Khan et al., 2020; Kim & Kim, 2022; Kocsis et al., 2022; Kougiannou & Mendonça, 2021; Kurniadi, 2025; Lazarevic et al., 2020; Li, 2024; Liu et al., 2023, 2024; López-Martínez et al., 2022; Lu et al., 2023; Mahamad et al., 2018; Masa'deh et al., 2024; Mbare et al., 2024; Mendonça et al., 2023; Miko & Abbas, 2024; Mitrsomwang & Chaikidurajai, 2025; Mohd et al., 2019; Muharemović et al., 2021; Novitasari & Anwar, 2022; Okoche et al., 2024; Rahman & Garnida, 2021; Repková-Štofková et al., 2023; Rolf et al., 2022, 2022, 2022; Saffie-Siebert et al., 2024; Sikora, 2024; Smith, 2023; Sułkowski et al., 2022; Suslowicz & Brömmelstroet, 2024; Teoh et al., 2020, 2020; Tuncali Yaman & Yaylalı, 2023; van Doorn & Chen, 2021; van Lopik et al., 2020; Veljović et al., 2024; Wang et al., 2021; Yohanna Sánchez et al., 2024; Yusoff et al., 2023; Zenezini et al., 2018; Zieher et al., 2024)	61=45%
3	Securing financial resources	(Boom-Cárcamo et al., 2024; Botsane et al., 2019; Čačić et al., 2024; Comi & Russo, 2022; Dina & Veronika, 2022; Filiopoulou et al., 2025; Gao et al., 2025; Hribernik et al., 2020; Jintana et al., 2021; Kafile & Mbhele, 2023; Karakikes & Nathanail, 2022; Kosovac & Muharemovic, 2021; Kurniadi, 2025; Lee et al., 2021; Mahamad et al., 2018; Masa'deh et al., 2024; Miko & Abbas, 2024; Mitrsomwang & Chaikidurajai, 2025; Moore & Newsome, 2018; Novitasari & Anwar, 2022; Prapinit et al., 2024; Rajendran & Harper, 2021; Russo & Comi, 2023; Seghezzi & Mangiaracina, 2023; S.M. Yuen & Yu, 2019; Smith, 2023; Sun et al., 2024; Suslowicz & Brömmelstroet, 2024; van Doorn & Chen, 2021; Veljović et al., 2024; Zenezini et al., 2018)	32=24%
4	Regulatory compliance and enggagement	(Abdul Manaf et al., 2022; Charles Sitorus et al., 2022; Chou & Gomes, 2023; Ejdys & Gulc, 2020; López-Martínez et al., 2022; Lu et al., 2023; Mbare et al., 2024; Moore & Newsome, 2018; Okoche et al., 2024; Rolf et al., 2022; Schneikart et al., 2024; Sikora, 2024; Smith, 2023; Sun et al.,	21=16%

		2024; Tuncali Yaman & Yaylalı, 2023; Yohanna Sánchez et al., 2024)	

This study set out to identify and synthesize strategies that were implemented through courier service providers for addressing the challenges of digital transformation that use a systematic literature review (SLR) framework combined and analyzed with bibliometric and thematic study . The results—validated through the PRISMA methodology—revealed four major strategic approaches:

1. **Investing in Digital Culture**: Organizations must go beyond mere technological adoption by fostering a mindset of innovation and adaptability. Training, digital literacy, and cultural readiness are essential to reduce resistance and encourage technology use. (16%)
2. **Building Robust Technological Infrastructure**: Effective digital transformation requires a reliable infrastructure encompassing both hardware (e.g., scanners, GPS devices) and software (e.g., logistics management systems, tracking apps). This facilitates automation and operational efficiency. (45%)
3. **Securing Financial Resources**: The implementation of digital solutions demands significant financial investments. Courier firms must secure sustainable funding—internally or through partnerships—to ensure long-term transformation success. (24%)
4. **Regulatory Compliance and Engagement**: Legal frameworks surrounding digital operations—such as data protection, privacy laws, and platform licensing—must be strictly observed. Active engagement with regulators can also shape more favorable digital logistics policies. (16%)

Together, these four strategic pillars form a comprehensive roadmap for courier service companies to transition successfully into the digital era, ensuring resilience, competitiveness, also compliance to evolve logistics landscape in rapid way.

Future Research

Future studies should explore regionally contextualized and human-centered strategies to strengthen digital transformation outcomes and bridge technological, cultural, and regulatory gaps in courier services.

CONCLUSION

To be concluded, this research presents a comprehensive synthesis of 89 scholarly publications related to digital transformation in the courier industrialization, analyzed with systematic literature review (SLR) approach as well as enhanced the visualization of bibliometric. The results indicate that digital transformation has been concern centrally with strategic imperative across logistics ecosystems, specifically the substance of post-pandemic recovery and the exponential growth of e-commerce.

Four key strategic categories were identified as central to navigating digital change. The most dominant strategy—**building robust technological infrastructure** (45%)—demonstrates the industry's prioritization of tools such as IoT, AI, and automation systems to optimize operations and enhance responsiveness. **Securing financial resources** (24%) highlights the need for sustainable funding models to support continuous innovation. **Investing in digital culture** (16%) emphasizes the importance of fostering digital literacy, agile leadership, and employee readiness to embrace technological shifts. Finally, **ensuring regulatory compliance and engagement** (16%) underscores the relevance of legal and policy frameworks in shaping responsible, secure, and equitable digital logistics practices.

The bibliometric analysis also maps a growing global discourse, with leading contributions from the United Kingdom, China, and Indonesia. Thematic clusters around last-mile innovation, AI adoption, and sustainability confirm a multidisciplinary interest in transforming courier logistics. However, while technological solutions are advancing, many studies point to the persistent challenge of aligning digital transformation with organizational readiness, policy support, and long-term societal impact.

In closing, this study not only consolidates current academic insights but also illuminates the strategic roadmap for future digital integration in courier services. It invites continued dialogue between scholars, policymakers, and industry leaders to co-create a digitally resilient, sustainable, and human-centered logistics future.

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