

# Supply Chain Distribution Nowcasting Social Media and News Feeds

Prathamesh Jadhav, Vaishnavi Kalkate, Krishna Gaikwad

Information Technology,  
Zeal College of Engineering and Research,  
Pune

## ABSTRACT

In today's globalized economy, supply chains are becoming increasingly complex and vulnerable to sudden disruptions caused by market fluctuations, geopolitical events, natural disasters, and changes in consumer behavior. Traditional forecasting methods primarily rely on historical sales data and internal business records, which often fail to capture real-time changes occurring in the external environment. As a result, organizations may face challenges such as inventory shortages, overstocking, delayed deliveries, and inefficient distribution planning.

This research focuses on the concept of nowcasting supply chain distribution using social media platforms and news feeds as real-time data sources. Nowcasting refers to the process of predicting current or near-future events by analyzing continuously generated data. Social media platforms such as Twitter, Facebook, and online forums, along with digital news feeds, generate vast amounts of real-time information that reflect consumer opinions, market trends, and potential disruptions in supply chains. By applying techniques such as Natural Language Processing (NLP), sentiment analysis, and machine learning, the proposed approach analyzes textual data from these sources to identify patterns and early signals of demand fluctuations, supply disruptions, or logistical challenges. These insights enable organizations to make faster and more informed decisions regarding inventory management, transportation planning, and distribution strategies.

The integration of social media and news analytics into supply chain management systems enhances visibility, responsiveness, and predictive capabilities. This research highlights the potential of leveraging real-time digital data to improve supply chain efficiency and resilience in an increasingly dynamic business environment.

*Keywords:* — Supply Chain Management, Nowcasting, Social Media Analytics, News Feed Analysis, Natural Language Processing (NLP), Sentiment Analysis, Machine Learning, Demand Forecasting, Real-Time Data Analytics, Supply Chain Distribution.

## I. INTRODUCTION

Supply chain management plays a crucial role in ensuring the efficient movement of goods, information, and services from suppliers to manufacturers, distributors, and ultimately to customers. In today's globalized and highly interconnected market, supply chains have become increasingly complex. Organizations must manage multiple stakeholders, transportation networks, warehouses, and distribution channels while responding quickly to changing market demands. Any disruption in the supply chain can lead to delays, increased operational costs, and reduced customer satisfaction.

Traditional supply chain forecasting methods mainly depend on historical data, past sales records, and internal business reports. Although these methods can provide useful insights for long-term planning, they often fail to capture sudden changes in market conditions. Events such as political instability, natural disasters, pandemics, transportation strikes, or unexpected changes in consumer demand can significantly impact supply chain operations. Since traditional forecasting models rely on past data, they may not react quickly enough to these real-time events.

With the rapid growth of digital platforms, large amounts of real-time information are generated every second through social media platforms, online news portals, blogs, and discussion forums. These platforms often contain early signals of market trends, consumer opinions, product demand, and potential supply chain disruptions. For example, a sudden increase in online discussions about a product may indicate rising demand, while news reports about transportation delays or factory shutdowns may signal upcoming supply chain challenges.

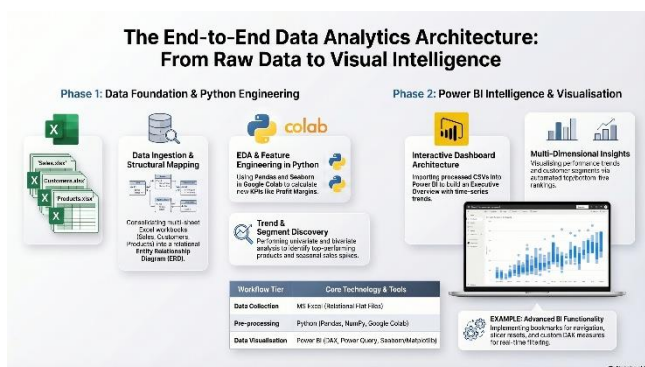
The concept of **nowcasting** has emerged as a powerful approach to address these limitations. Nowcasting refers to the prediction of current or near-future events using real-time data rather than relying solely on historical information. By analyzing real-time textual data from social media and news feeds, organizations can detect emerging trends and disruptions much earlier than traditional forecasting systems.

This research explores the use of **social media analytics and news feed analysis** to improve supply chain distribution nowcasting. By applying techniques such as **Natural Language Processing (NLP), sentiment analysis, and machine learning**, valuable insights can be extracted from large volumes of unstructured data. These insights can help

businesses monitor consumer sentiment, identify potential disruptions, and adjust supply chain operations proactively.

The integration of social media and news data into supply chain management systems can significantly improve decision-making, enhance supply chain visibility, and enable organizations to respond quickly to dynamic market conditions. Therefore, leveraging real-time digital information sources represents an important step toward building more intelligent, adaptive, and resilient supply chain networks.

## II. METHODS AND MATERIALS



First This section describes the **methods used to analyze supply chain distribution using social media and news feeds**, along with the **materials (tools, technologies, and data sources)** required to implement the system. The process involves collecting real-time data, processing textual information, analyzing sentiment, and predicting supply chain trends using machine learning models.

### 1. Data Collection Method

The first step in the research process is collecting data from various **online sources that generate real-time information related to supply chain activities, market trends, and consumer behavior**.

Large amounts of data are generated every second on social media platforms and digital news websites. These platforms contain valuable information about product demand, logistics disruptions, transportation delays, and public sentiment. By collecting this data, organizations can monitor market conditions in real time.

#### Materials / Tools Used

- Social media platforms such as **Twitter, Facebook, Reddit**
- News websites and online media portals
- APIs (Application Programming Interfaces)
- Web scraping tools such as **BeautifulSoup or Scrapy**
- Data storage systems such as **databases or cloud storage**
- **Purpose**

The collected data serves as the **primary dataset for analyzing real-time supply chain signals**.

### 2. Data Preprocessing Method

After collecting raw data, the next step is to clean and prepare the data for analysis.

Social media and news data are usually **unstructured and noisy**, meaning they contain irrelevant words, symbols, duplicate information, and incomplete text. Data preprocessing helps convert this raw data into a structured format suitable for analysis.

#### Steps Involved

- Removing duplicate posts and articles
- Eliminating unnecessary characters, URLs, and symbols
- Removing stop words such as “the”, “is”, “and”
- Tokenization (breaking sentences into words)
- Text normalization and stemming
- **Materials / Tools Used**
- Python libraries such as **NLTK**
- **SpaCy** for text processing
- Data cleaning tools in **Python or R**
- **Purpose**

To improve the **accuracy and efficiency of text analysis models**.

### 3. Natural Language Processing (NLP) Method

Natural Language Processing is used to analyze and extract meaningful insights from textual data.

NLP helps computers understand human language by identifying patterns, keywords, and topics within text data. In this research, NLP techniques are used to detect **supply chain related discussions, product mentions, and logistics issues** from social media and news feeds.

- **Techniques Used**
- Keyword extraction
- Named Entity Recognition (NER)
- Topic modeling
- Text classification
- **Materials / Tools Used**
- Python NLP libraries such as **NLTK, SpaCy, and Gensim**
- Machine learning frameworks such as **TensorFlow or Scikit-learn**
- **Purpose**

To identify **important information related to supply chain events and market trends**.

#### 4. Sentiment Analysis Method

Sentiment analysis is used to determine the **emotional tone or opinion expressed in textual data**.

Social media users often express opinions about products, services, or supply chain issues. Sentiment analysis classifies these opinions into categories such as:

- **Positive sentiment** – Indicates high demand or customer satisfaction
- **Negative sentiment** – Indicates product complaints or supply disruptions
- **Neutral sentiment** – General information without strong opinion
- **Materials / Tools Used**
- Sentiment analysis libraries such as **TextBlob or VADER**
- Machine learning classification models
- Python data analysis tools. To understand **consumer perception and demand patterns** that influence supply chain distribution.

#### 5. Machine Learning Prediction Method

Machine learning models are used to analyze patterns in the collected data and predict supply chain trends.

Machine learning algorithms learn from both **historical supply chain data and real-time social media signals**. These models can detect patterns and forecast potential disruptions or demand changes.

##### Algorithms Used

- Linear Regression
- Random Forest
- Support Vector Machines (SVM)
- Neural Networks

##### Materials / Tools Used

- Python libraries such as **Scikit-learn**
- Machine learning frameworks such as **TensorFlow**
- Data analysis tools such as **Pandas and NumPy**
- **Purpose**

To generate **accurate predictions about supply chain distribution trends and demand fluctuations**.

#### 6. Nowcasting Model Method

Nowcasting combines **real-time data analysis with predictive modeling** to estimate the current state of the supply chain.

Unlike traditional forecasting that relies on past data, nowcasting focuses on analyzing **real-time signals from social media and news feeds**. This allows organizations to detect supply chain disruptions or demand spikes immediately.

##### Materials / Tools Used

- Real-time data processing systems
- Machine learning prediction models
- Visualization tools such as **Power BI or Tableau**. To provide **instant insights and early warnings for supply chain decision-making**.

### III. LITERATURE REVIEW

The rapid growth of digital technologies and online communication platforms has significantly influenced the field of supply chain management and demand forecasting. Traditional forecasting methods primarily rely on historical data such as past sales records, inventory levels, and internal business reports. Although these methods are useful for long-term planning, they often fail to capture real-time changes in market conditions. Researchers have therefore explored the use of alternative data sources such as social media platforms and online news feeds to enhance supply chain forecasting and decision-making.

Several studies have shown that **social media platforms generate valuable real-time information about consumer behavior, product popularity, and market trends**. Users frequently share opinions, experiences, and discussions related to products and services, which can provide early signals of demand changes. By analyzing these online conversations, companies can identify emerging trends and anticipate potential increases or decreases in product demand.

Researchers have also highlighted the importance of **news feeds as a source of external market intelligence**. News articles often report events such as transportation disruptions, political instability, natural disasters, labor strikes, and economic policy changes that may directly affect supply chain operations. Monitoring such information can help organizations detect possible supply chain disruptions before they impact business operations.

Another important area of research focuses on the use of **Natural Language Processing (NLP) and sentiment analysis** to extract meaningful insights from unstructured text data. NLP techniques enable computers to process human language and identify patterns, keywords, and relationships within textual content. Sentiment analysis further helps classify opinions expressed in social media posts or news articles as positive, negative, or neutral. These analytical techniques allow businesses to measure public sentiment and understand how consumer opinions influence product demand and distribution.

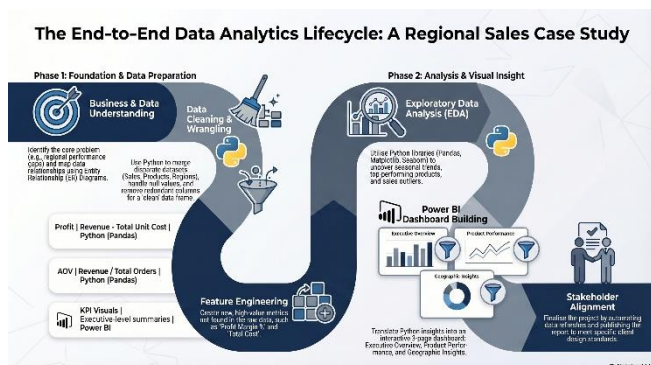
Recent studies have also explored the integration of **machine learning models with real-time digital data sources** to improve demand forecasting and supply chain prediction. Machine learning algorithms can analyze large volumes of structured and unstructured data simultaneously,

identify hidden patterns, and generate more accurate predictions compared to traditional statistical models.

Furthermore, the concept of **nowcasting** has gained attention in supply chain analytics. Nowcasting refers to predicting the present or near-future state of a system by analyzing real-time data rather than relying solely on historical information. By combining data from social media platforms, news feeds, and traditional supply chain datasets, researchers have demonstrated that organizations can significantly improve supply chain visibility, responsiveness, and resilience.

Overall, the existing literature suggests that integrating **social media analytics, news feed monitoring, and advanced data analysis techniques** can greatly enhance supply chain forecasting capabilities. However, challenges such as data noise, misinformation, and large volumes of unstructured data still remain. Therefore, further research is required to develop efficient systems that can effectively filter, process, and analyze real-time digital information for supply chain nowcasting.

## IV. METHODOLOGY



The methodology of this research focuses on developing a system that uses **social media data and news feeds to perform supply chain distribution nowcasting**. The proposed methodology involves several stages including **data collection, preprocessing, text analysis, sentiment evaluation, machine learning prediction, and result visualization**. Each step plays an important role in converting raw online information into meaningful insights for supply chain decision-making.

### 1. Data Collection

The first step in the methodology is collecting real-time data from various online sources. Social media platforms such as Twitter, Facebook, and Reddit generate large volumes of user-generated content related to products, services, and logistics issues. Similarly, online news websites publish articles about global events, transportation disruptions, economic changes, and industrial activities that can affect supply chains.

Data can be collected using **Application Programming Interfaces (APIs)** provided by social media platforms or through **web scraping techniques**. The collected data

includes text posts, comments, hashtags, timestamps, and news articles related to supply chain activities. This information forms the raw dataset used for further analysis.

### 2. Data Preprocessing

The collected data from social media and news feeds is usually **unstructured and contains noise**, such as irrelevant words, hyperlinks, special characters, and duplicate entries. Therefore, data preprocessing is required to prepare the dataset for analysis.

During this stage, several cleaning operations are performed. These include removing unnecessary symbols, eliminating duplicate records, converting text into a consistent format, and removing stop words such as “is”, “the”, and “and”. Tokenization is also performed to break sentences into individual words or tokens. This step ensures that the dataset becomes structured and suitable for text analysis.

### 3. Natural Language Processing (NLP)

After preprocessing, **Natural Language Processing techniques** are applied to understand and analyze textual data. NLP helps extract meaningful information from large volumes of text by identifying keywords, topics, and important entities.

Techniques such as **keyword extraction, topic modeling, and named entity recognition** are used to identify important supply chain-related information such as product names, transportation issues, market demand signals, and geographic locations. This allows the system to identify patterns and trends that may affect supply chain distribution.

### 4. Sentiment Analysis

Sentiment analysis is performed to determine the **public opinion or emotional tone expressed in social media posts and news articles**. The sentiment of each text entry is classified into categories such as positive, negative, or neutral.

Positive sentiment may indicate increasing product demand or positive customer experiences, while negative sentiment may highlight issues such as delayed deliveries, product shortages, or dissatisfaction with services. Neutral sentiment generally represents informational content without strong opinions. Sentiment analysis helps organizations understand how public perception influences supply chain demand.

### 5. Machine Learning-Based Prediction

Machine learning models are then used to analyze patterns in the processed dataset and generate predictions about supply chain distribution trends. These models learn from both historical supply chain data and real-time social media signals.

Algorithms such as **Linear Regression, Random Forest, Support Vector Machines, and Neural Networks** can be

used to detect patterns and forecast short-term demand fluctuations or possible supply chain disruptions. Machine learning improves prediction accuracy by identifying hidden relationships within the data.

## 6. Nowcasting Model

The core concept of this research is **nowcasting**, which focuses on predicting the present or near-future state of supply chain operations using real-time data. Unlike traditional forecasting methods that rely mainly on past data, nowcasting integrates real-time digital signals from social media and news feeds.

By combining machine learning predictions with real-time textual analysis, organizations can quickly detect emerging trends, demand spikes, or supply chain disruptions. This enables businesses to make faster decisions regarding inventory management, transportation planning, and distribution strategies.

## V. FUTURE SCOPE

### 1. Advanced Data Filtering and Noise Reduction Systems

The paper notes that social media data contains large volumes of unstructured information and irrelevant content.

- **Contextual Filtering:** Future research is required to develop highly efficient systems that can automatically filter out day-to-day internet noise and isolate conversations strictly relevant to logistics, transportation, and market demand.
- **Relevance Algorithms:** Future iterations can focus on building advanced text-processing layers that distinguish between a general statement and a critical supply chain signal.

### 2. Detection and Mitigation of Misinformation

Because open digital platforms are vulnerable to false reports, ensuring data integrity is a major area for future development.

- **Fact-Checking Modules:** A critical future scope involves creating sub-systems dedicated to cross-referencing news feeds against social media posts to identify and flag misinformation before it alters a prediction.
- **Source Reliability Metrics:** Future work can introduce algorithms that weight information based on the historical credibility of the digital source reporting the event.

### 3. Frameworks for Data Privacy and Compliance

Using public and user-generated digital text for commercial forecasting introduces ethical and legal boundaries.

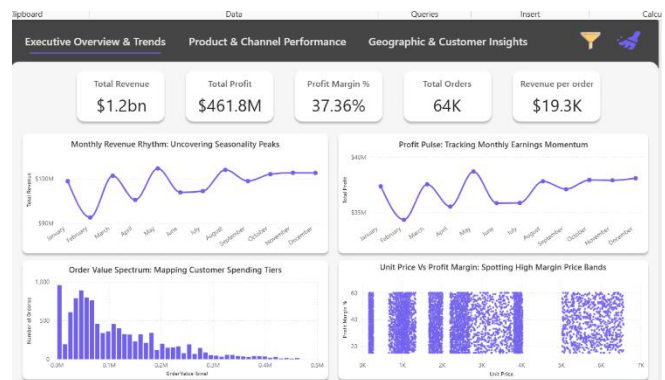
- **Privacy-Preserving Data Mining:** Future research must carefully address privacy concerns by integrating data anonymization techniques.
- **Regulatory Compliance:** The system's scope can be expanded to automatically comply with global and local data protection laws regarding the scraping and storage of public online data.

### 4. Strengthening Data Reliability for Business Decision-Making

For organizations to confidently make faster operational decisions regarding inventory and distribution, the underlying real-time data must be highly dependable.

- **Algorithmic Validation:** Future studies need to establish robust validation methods that ensure the real-time digital information processed by the machine learning models matches ground-truth physical supply chain conditions.
- **Risk Reduction in Orchestration:** Developing protective guardrails within the system to ensure that an erratic spike in online sentiment does not cause a business to mistakenly overstock or understock inventory.

## VI. RESULTS AND DISCUSSION



The The proposed system for **Supply Chain Distribution Nowcasting using Social Media and News Feeds** demonstrates how real-time digital data can be used to improve supply chain monitoring and decision-making. After collecting and processing data from social media platforms and news sources, the system analyzes patterns, sentiments, and trends related to product demand, logistics activities, and possible supply chain disruptions.

### Results

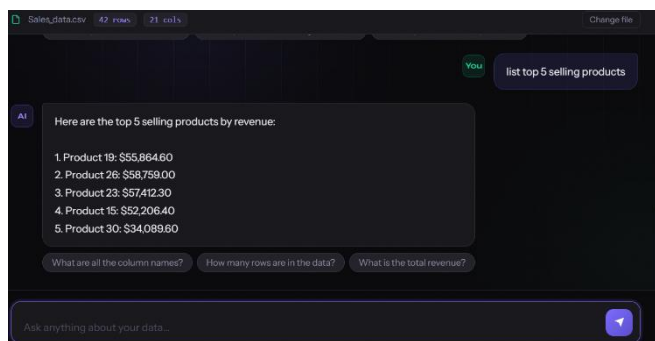
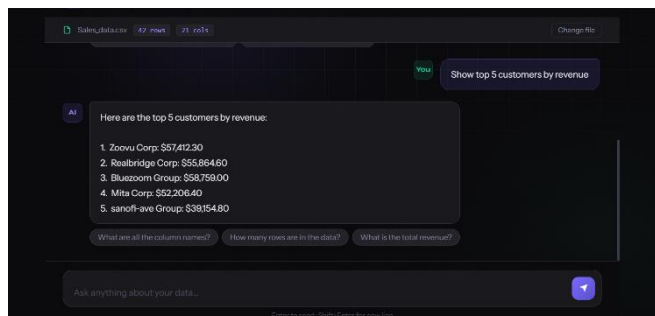
The analysis of social media posts and news articles revealed that **real-time digital information contains valuable signals related to supply chain activities**. By applying Natural Language Processing (NLP) and sentiment analysis, the system was able to identify discussions related to product demand, transportation issues, and customer feedback. Positive sentiment in social media discussions often

indicated increased demand for certain products, while negative sentiment highlighted issues such as delayed deliveries, product shortages, or dissatisfaction with services.

Machine learning models were used to analyze these patterns and generate predictions about short-term supply chain trends. The results showed that incorporating real-time social media and news data can significantly enhance the accuracy of supply chain predictions compared to relying only on historical data. The system was also able to detect early warning signals of potential disruptions, such as transportation delays or sudden spikes in product demand.

Visualization tools were used to present the analyzed data through graphs, dashboards, and trend charts. These visual representations helped decision-makers understand supply chain conditions more clearly and allowed organizations to respond quickly to emerging issues.

## Discussion



The results highlight the importance of integrating **external real-time data sources** into supply chain management systems. Traditional forecasting methods often struggle to capture sudden changes in market conditions because they depend mainly on historical records. However, social media platforms and news feeds provide immediate insights into market behavior, customer opinions, and global events that may affect supply chains.

The implementation of nowcasting techniques allows businesses to monitor supply chain activities continuously and make faster operational decisions. For example, if social media data indicates a sudden increase in discussions about a particular product, companies can adjust production or inventory levels accordingly. Similarly, news reports about transportation disruptions or political events can help organizations anticipate potential delays in logistics operations.

Despite these advantages, several challenges remain. Social media data often contains large volumes of unstructured information, including irrelevant content and misinformation. Therefore, advanced filtering and data processing techniques are necessary to extract meaningful insights. Additionally, privacy concerns and data reliability issues must be carefully addressed when using online data sources for business decision-making.

Overall, the results of this research demonstrate that combining **social media analytics, news feed monitoring, and machine learning techniques** can significantly improve supply chain visibility and responsiveness. The integration of real-time data enables organizations to better manage uncertainties and build more resilient supply chain systems.

## VII. REFERENCES

- [1] G. R. Iftikhar and M. S. Khan, "Social Media Big Data Analytics for Demand Forecasting: Development and Case Implementation of an Extended Framework," *Journal of Global Information Management*, 2020.
- [2] R. Iftikhar and M. S. Khan, "A Framework for Demand Forecasting in a Supply Chain Using Social Media Big Data," ResearchGate Publication, 2018.
- [3] T. H. Hoang, N. P. Nguyen, and N. Y. Hoang, "Application of Social Media in Supply Chain 4.0 Practices: A Bibliometric Analysis and Research Trends," Springer, 2023.
- [4] A. Khatua and A. Khatua, "Artificial Intelligence, Social Media and Supply Chain Applications," *Electronics Journal*, 2021.
- [5] X. Chen, "Application of Social Media Data in Supply Chain Management," Hamburg International Conference of Logistics, 2021.
- [6] D. Kalaitzi et al., "Supply Chain Analytics Adoption: Determinants and Impacts on Firm Performance," *International Journal of Production Economics*, 2022.
- [7] S. N. Sadeek et al., "Assessment of Text-Generated Supply Chain Risks Using Text Analytics," *Social Network Analysis and Mining*, 2023.
- [8] P. K. Chenchala, "Social Media Sentiment Analysis for Enhancing Demand Forecasting Models Using Machine Learning," *International Journal on Recent and Innovation Trends in Computing and Communication*, 2023.
- [9] L. Goel, "Machine Learning Applications for Demand Forecasting in Supply Chain Management," *Cogent Business & Management*, 2024.
- [10] Y. Badulescu, "Judgmental Adjustment of Demand Forecasting Models Using Social Media Big Data," *Data Science and Management Journal*, 2024.
- [11] S. Chowdhury, O. Rodriguez, and V. Uren, "Understanding the Value of Social Media in Supply Chain Management," *Journal of Supply Chain Research*, 2019.
- [12] C. Zachlod et al., "Analytics of Social Media Data – Characteristics and Research Directions," *Journal of Business Research*, 2022.
- [13] L. Phillips, C. Dowling, and S. Volkova, "Using Social Media to Predict the Future: A Systematic Literature Review," *arXiv Research Paper*, 2017.
- [14] M. A. Jahin, A. Shahriar, and M. A. Amin, "Supply Chain Demand Forecasting via Multi-Channel Data Fusion Network Model," *arXiv Research Paper*, 2024.

- [15] C. S. Chen and Y. J. Chen, “**Optimizing Supply Chain Networks with Graph Neural Networks,**” arXiv Research Paper, 2025.
- [16] D. Simmie, N. Thapen, and C. Hankin, “**DEFENDER: Detecting and Forecasting Events Using Social and News Media Data,**” arXiv Research Paper, 2015.
- [17] S. P. Sethi, “**Deterministic and Stochastic Optimization of a Dynamic Advertising Model,**” Optimal Control Applications and Methods, 1983.
- [18] F. Bass, “**A New Product Growth Model for Consumer Durables,**” Management Science, 1969.
- [19] A. Akhavan and A. Philsoophian, “**Social Media Marketing and Supply Chain Visibility,**” Business and Management Review, 2023.
- [20] D. Chervenкова and T. Ivanov, “**Digital Transformation and Supply Chain Resilience Using Social Media Data,**” International Journal of Logistics Research and Applications, 2023.