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Integrating distribution and supply logistics: a systemic conceptual framework
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Integrating distribution and supply logistics: a systemic conceptual framework

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Keywords: distribution logistics, supply logistics, conceptual framework, logistics chain, logistics system.
Abstract: This paper examines the conceptual, structural, and functional relationships between distribution logistics and supply logistics, two domains that are often perceived as synonymous despite their fundamentally different roles within the logistics chain. The study clarifies frequently used terms, defines their correct positioning within distribution and supply logistics, and analyses their interconnections in the context of material, information, and financial flows. Based on established scientific literature, professional standards, and practical project experience, the paper highlights the distinctions between distribution, physical distribution, physical supply, and distribution logistics as a system. It further explains the functions of distribution in value creation, harmonisation of supply and demand, and execution of essential operational activities, including transport, storage, regrouping, and customer service. The research emphasises the systemic integration of distribution and supply as inseparable parts of a single chain, driven by the potential difference between supply and demand. The paper also outlines the structural role of distribution channels, logistics channels, and acquisition and logistics distribution subsystems, illustrating how coordinated strategic and operational decisions influence the performance of the entire logistics system. By defining key terms and illustrating their relationships, the study contributes to a clearer conceptual framework for logistics professionals and supports more accurate use of logistics terminology in academic and practical environments. The proposed framework supports consistent terminology usage in logistics education, research, and practical system design.

1 Introduction

Distribution logistics and supply logistics represent two fundamental but frequently misunderstood components of logistics systems. Although these concepts are often used interchangeably, each performs distinct strategic and operational functions that are essential for ensuring the efficient movement of goods, materials, information, and financial resources. In practice, imprecise terminology may lead to conceptual ambiguity, thereby limiting effective communication among researchers, practitioners, and operational staff.

The primary aim of this article is to clarify these concepts, to define their structural relationships, and to highlight their roles in achieving coordinated logistics flows (Figure 1). The paper examines how distribution and supply jointly shape the performance of logistics systems and contribute to value creation, customer satisfaction, and overall market functionality. The motivation for this research arises from long-term practical project experience and the identified need to systematize terminology within the field of distribution and supply logistics.

Figure 1 presents a conceptual framework illustrating the relationships among logistics levels, distribution logistics, supply logistics, and their physical execution. The model distinguishes macrologistics, metalogistics, and micrologistics as hierarchical levels of logistics management and shows how supply logistics and distribution logistics operate as system-level constructs integrating strategic, tactical, and operational activities.

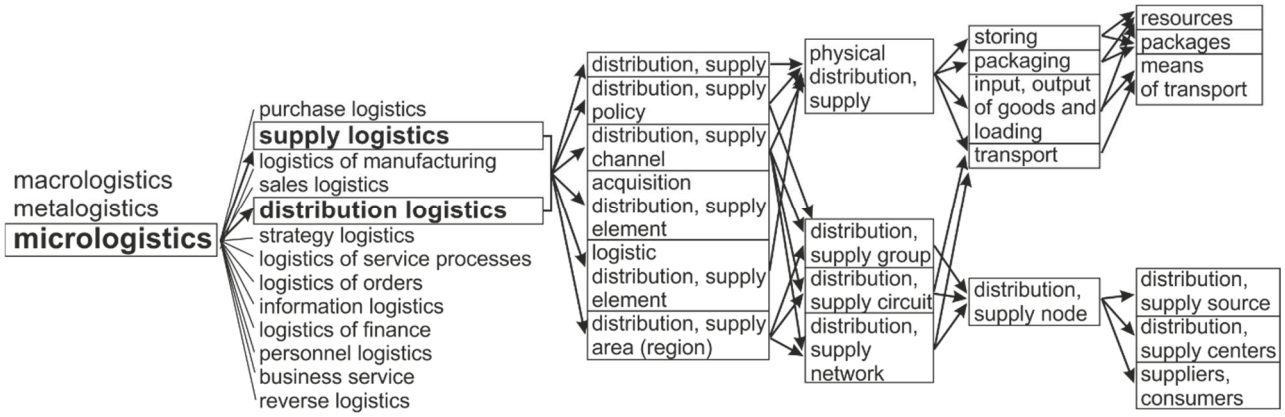

Figure 1 Terms in distribution logistics, supply logistics and their interconnection
Source: author's conceptual model

Distribution and supply elements, channels, networks, and nodes represent the structural components of logistics systems, while physical distribution and physical supply reflect the operational execution of material flows, including storage, packaging, handling, loading, and transport. The figure emphasizes that physical distribution and physical supply are not synonymous with distribution logistics or supply logistics, but rather represent their operational realization supported by resources, packages, and means of transport.

Distribution logistics encompasses strategic, tactical, and operational activities related to the organisation and management of distribution processes, including warehouse location decisions, preparation of documentation, loading operations, transport arrangement, personnel selection in distribution activities, and route planning. Its primary role is to ensure that products are delivered to customers efficiently and reliably in accordance with market requirements.

Distribution itself represents a coordinated flow of goods, products, information, and, in certain cases, non-material items within a logistics system. Unlike distribution logistics, distribution does not address strategic decisions such as the location of warehouses or logistics centres; these are the responsibility of distribution logistics at the strategic decision-making level.

Supply logistics focuses on the analysis, selection, and implementation of activities and strategic decisions related to the provision of materials, semi-finished products, and goods required for production, sales, and marketing processes. Its objective is to ensure the continuity and reliability of upstream logistics processes.

Physical distribution and physical supply address the operational execution of logistics activities, specifically the physical movement of goods, materials, and products, as well as their storage and order fulfilment. These activities form the operational foundation upon which distribution logistics and supply logistics are implemented.

2 Literature review

Scientific literature and professional standards, including the Association for Supply Chain Management (APICS) and the Council of Supply Chain Management Professionals (CSCMP), provide a wide spectrum of interpretations of distribution, physical distribution, supply, logistics channels, and distribution channels. This literature review examines existing definitions and conceptual approaches to these terms with the aim of identifying commonalities, differences, and unresolved terminological ambiguities.

The APICS Dictionary [1] defines distribution as a set of activities associated with the movement of materials and finished goods, encompassing transportation, warehousing, packaging, and information processing. Physical distribution and physical supply address the spatial movement and storage of materials and products.

Research further differentiates distribution logistics as a systemic discipline responsible for strategic decisions related to warehouse location, route planning, transport coordination, and market servicing. Authors such as [2-4] underline the interconnectedness of distribution and supply within a unified chain driven by the potential difference between supply and demand.

A supply chain may be defined as an integrated process in which multiple business entities-such as suppliers, manufacturers, distributors, and retailers-collaborate to acquire raw materials, convert them into finished products, and deliver these products to customers [5]. This chain is traditionally characterized by a forward flow of materials and a backward flow of information.

Prior studies [6] note that historically, the three fundamental stages of the supply chain-procurement, production, and distribution-were managed independently and buffered by large inventories. Increasing competitive pressures and market globalization are forcing firms to develop supply chains capable of rapidly responding to customer needs. Advances in communication and information technologies, along with expanding logistics options, provide opportunities to reduce operating costs through coordinated planning of these stages.

Research further indicates that supply chain agility significantly affects an organisation's ability to deliver innovative products in a timely and cost-effective manner in a dynamic global environment [7]. Supply chain network design also plays a critical role in determining system structure, costs, and performance, involving strategic, tactical, and operational decisions such as facility location, distribution policies, transportation, and inventory management [8].

Other studies emphasize the importance of understanding customer needs and aligning offerings accordingly to improve demand chain efficiency and customer satisfaction [9]. Recent research highlights that product distribution has been intensively debated, particularly during the COVID-19 pandemic, when sudden changes in local demand triggered bullwhip effects and exposed the limited responsiveness of many supply chains [10].

Sustainability-oriented research points to the potential of circular economy principles in logistics systems, while also acknowledging the challenges arising from system complexity and dynamism [11]. Further studies show that requirements for material flow services differ across countries depending on economic development levels, emphasizing the need for compatibility between logistics systems and national development stages [12].

Distribution is frequently identified as a key logistics function and a critical link between manufacturers and customers, significantly influencing both logistics costs and customer experience [13]. The strategic importance of supply chains has increased due to globalization, leading to expanded roles for supply chain managers and greater emphasis on cross-functional coordination and organisational learning [14].

Technological development and the growth of e-business have intensified the challenges associated with logistics distribution, particularly in facilitating efficient flows from manufacturers to consumers [15]. Transport processes remain fundamental to logistics chain realization across industries, representing the physical assurance of goods movement [16].

Recent research has also explored logistics service supply chains, emphasizing the interdependence between logistics service integrators and functional service providers [17]. Effective supply chain management requires coordination of material and information flows across suppliers, manufacturers, wholesalers, and retailers, often supported by increasing levels of automation [18].

Additional studies integrate sustainability and supply chain management, highlighting shared value creation and best practices [19], while others stress that supply chain design and management constitute critical strategic challenges for multinational enterprises operating globally [20]. Supply chains can also be modelled as complex networks composed of nodes and interconnected flows of materials, capital, and information [21].

Empirical studies further demonstrate that underdeveloped supply chain systems may limit competitiveness, as illustrated by rapidly growing economies such as China [22]. Simulation-based approaches have been applied to analyse and mitigate bottlenecks in supply flows, particularly in automotive manufacturing systems [23].

Overall, the reviewed literature confirms that distribution and supply are widely recognized as critical components of logistics and supply chain systems. At the same time, significant variability exists in how these concepts are defined, structured, and applied, particularly with respect to the distinction between distribution, distribution logistics, physical distribution, and supply logistics. While many studies emphasize integration, coordination, and flow continuity, fewer explicitly address the terminological boundaries and systemic relationships among these concepts. This gap highlights the need for a structured conceptual framework that clarifies their roles and interconnections, which the present study seeks to address.

3 Methodology

This research is grounded in key theoretical postulates of distribution and supply logistics, which serve as analytical premises highlighting the significance and systemic role of these processes in logistics systems [24]. These postulates include:

- Distribution and supply are essential prerequisites for the availability of goods in the market.
- Distribution and supply represent systemically interconnected components of logistics systems.
- Distribution and supply are globally present and implemented in various organisational and structural forms.
- Distribution and supply costs may exceed the value of the distributed product.

The methodological framework of the study is based on conceptual and terminological analysis of distribution and supply logistics. Definitions and interpretations are derived from scientific literature, internationally recognized industry standards, and long-term professional experience in logistics practice. The methodological approach consists of the following steps:

- Identification, extraction, and classification of key terms frequently used in distribution and supply logistics.
- Structural positioning of these terms within distribution logistics through conceptual and relational diagrams.
- Comparative analysis of definitions provided by APICS, CSCMP, and selected academic sources to identify conceptual overlaps and distinctions.
- Interpretative synthesis supported by practical project experience, where distribution and supply processes were designed, implemented, and evaluated.

The study does not employ empirical data collection or statistical analysis. Instead, it focuses on systematic conceptual clarification and classification, aiming to improve consistency, transparency, and coherence in logistics terminology and to provide a structured theoretical framework for further empirical research.

4 Results

The analysis confirms that distribution, supply, physical distribution, physical supply, and distribution logistics represent distinct, non-synonymous concepts, each occupying a specific and clearly defined position within the logistics structure. Although closely related, these concepts differ in their scope, functions, and levels of decision-making within logistics systems.

Distribution logistics emerges as a comprehensive system integrating strategic, tactical, and operational activities aimed at supplying products to customers in an efficient and coordinated manner. Distribution ensures the alignment of material, product, and information flows with the objective of satisfying customer requirements, while supply focuses on securing the materials and products necessary for production, trade, and consumption.

The results further demonstrate that distribution and supply are inseparable components of a single logistics chain, jointly forming the continuous flow from sources of raw materials to final consumers. Their functions encompass purchasing, transport, storage, regrouping, sales, customer service, and a range of value-added activities that enhance market performance.

Distribution and supply channels are composed of producers, intermediaries, consumers, and supporting institutions, all of which enable the efficient coordination of physical, information, and financial flows. Within this structure, two principal functional subsystems were identified: the acquisition distribution subsystem,

responsible for establishing legal, economic, and social relationships among distribution participants, and the logistics distribution subsystem, responsible for the movement and storage of goods in space and time.

Overall, the findings confirm that distribution logistics should be understood as an integrated system that transcends isolated functions or channels, encompassing strategic, tactical, and operational dimensions across the entire supply chain.

In addition to definitions, Table 1 classifies key terms according to their logistics level or system role, supporting a clearer distinction between strategic, structural and operational concepts.

Table 1 The terms and their definitions, which occur most frequently in distribution and supply logistics

The definitions without explicit attribution represent authorial conceptual definitions intended to support terminological consistency and do not claim normative or standard-setting status.		
Term	**Definition**	**Logistics level / system role**
Acquisition distribution subsystem	**An acquisition distribution subsystem** is responsible for establishing legal, economic, informational, and social relationships among distribution participants between whom goods are exchanged.	Institutional / relational subsystem (legal, economic, informational coordination)
Consumer	**A consumer** is an element of the distribution network in which goods are accumulated and subsequently consumed. The consumer may also generate materials, raw materials, and waste that become the subject of reverse logistics.	End node of the logistics system (market interface, demand generation)
Distribution	**Distribution** is the process by which goods and products of varying nature and character are organised to create a coordinated flow aimed at satisfying the requirements of customers, consumers, and users.	Downstream flow process (market-oriented logistics flow)
Distribution area (region)	**A distribution area** consists of a finite set of elements that influence the specific functionality of distribution and interact with one another. It represents a limited distribution space that includes distribution locations, means of transport, the distribution network, and their mutual relationships.	Spatial–structural level (regional logistics environment)
Distribution centre	**A distribution centre** is an element of the distribution network in which goods are accumulated and from which controlled distribution to consumer markets is subsequently carried out.	Structural node (buffering and control point)
Distribution channel	**A distribution channel** is a set of elements that create flows of material goods and information products.	Structural–process interface (flow-enabling structure)
Distribution circuit	**A distribution circuit** is a configuration of distribution nodes served from a single distribution point or source, where a vehicle is capable considering quantity, maximum distribution range, time constraints, and vehicle capacity of serving these nodes within a single trip.	Operational routing structure (vehicle-based distribution execution)
Distribution group	**A distribution group** is an aggregation of distribution nodes formed according to defined criteria for the purpose of dividing a distribution region into smaller, structured parts within a distribution network.	Structural aggregation level (network segmentation)
Distribution logistics	**Distribution logistics** encompasses the analysis, selection, and implementation of activities, strategies, and decisions related to supplying products to customers in order to ensure the failure-free functioning of the market. Distribution logistics is understood as a system.	System-level construct (strategic–tactical–operational integration)
Distribution network	**A distribution network** is the interconnection of elements within a distribution space through transport systems in order to meet customer requirements.	Structural system (interconnected logistics elements)
Distribution node	**A distribution node** is a general term referring to a distribution location, distribution source, or distribution warehouse, involving activities such as storage, sorting, packaging, assortment management, record keeping, and subsequent distribution.	Structural element (storage, sorting, dispatch point)
Distribution policy	**Distribution policy** is the process of making strategic decisions concerning the route of a product or service from producers to final consumers or processors.	Strategic decision-making level
Distribution source	**A distribution source** is the central element of a distribution network where goods are produced and from which they are subsequently distributed to distribution centres or distribution points.	Primary production node (origin of downstream flows)
Distribution system	**The distribution system** consists of selected modes of transport, service personnel, and distribution points that collectively form a specific distribution network.	Operational–structural subsystem (transport modes, staff, nodes)
Logistics channel (logistics chain)	**A logistics channel, or logistics chain,** is a set of elements organised to enable the coordinated flow of materials, information, and financial resources in pursuit of a specific objective.	System integrator (material, information and financial flows)
Logistics distribution subsystem	**The logistics distribution subsystem** focuses on the spatial and temporal movement of physical goods through transport and storage.	Tactical–operational subsystem (spatial and temporal flow execution)

Means of transport	**Means of transport** are transport devices used for the execution of a specific transport mode assigned to particular types of goods..	Operational resource (physical flow execution)
Micrologistics	**Micrologistics** refers to logistics at the level of an individual enterprise or industrial firm. It comprises the basic and supporting subsystems of the enterprise.	Enterprise-level logistics system
Output of goods, loading	**Output of goods and loading** is the process by which goods are physically released from production and loaded onto a vehicle in compliance with internal and external safety requirements for personnel, equipment, and cargo, in order to deliver the goods to the customer in the required type, quantity, location, quality, and time.	Operational execution activity
Package	**A package** is a product used to store, preserve, and protect another product, ensuring user requirements are met while safeguarding the packaged product itself.	Operational support element (protection and handling unit)
Packaging	**Packaging** involves the preparation and completion of goods batches according to orders into appropriate shipping units. It is defined as the process of placing goods, products, objects, and, in specific cases, animals or plants into containers designed for this purpose, while maintaining required technical and safety conditions.	Operational process (unitization and preparation of goods)
Physical distribution and physical supply	**Physical distribution and physical supply** involve the movement of goods and materials, storage, and order fulfilment as part of operational logistics execution.	Operational execution level (movement, storage, fulfilment)
Shared logistics	**Shared logistics** represents the joint utilisation of logistics chain resources by multiple entities. Supply, production, and distribution facilities, as well as logistics services, may be shared to reduce overall costs.	Inter-organisational logistics system (resource integration)
Shared services	**Shared services** refer to the consolidation of an organisation's back-office processes into a separate unit that provides services to the parent company and, in some cases, external customers. This approach typically reduces costs through consolidation and may improve service quality due to increased specialisation and focus.	Organisational support system (non-material logistics support)
Stocks	**Stocks** are materials, raw materials, semi-finished products, or goods stored at designated locations for clearly defined purposes of use.	Operational buffer (inventory level)
Storage	**Storage** is the process of holding materials, goods, products, and raw materials over time while preparing transport units in accordance with customer requirements, production needs, and transport capabilities, in order to ensure continuity of material flows, satisfy market demand, and support subsequent activities such as loading, unloading, transport, distribution management, and document preparation.	Operational process (temporal buffering and preparation)
Supply	**Supply** is the process of acquiring materials, goods, products, and resources of varying nature for the purpose of ensuring the functioning of production, trade, or consumption.	Upstream flow process (input-oriented logistics flow)
Supply logistics	**Supply logistics** encompasses the analysis, selection, and implementation of activities, strategies, and decisions related to the provision of materials, semi-finished products, and goods, ensuring the failure-free operation of subsequent production, sales, and marketing processes.	System-level construct (strategic–tactical upstream coordination)
Transport	**Transport** refers to overcoming distance or changing the location of goods through the use of appropriate means of transport.	Operational execution process (spatial movement)

The classification in the third column does not redefine the terms themselves but clarifies their position within the logistics system, distinguishing between system-level constructs, structural elements, flow processes and operational execution.

Distribution represents the downstream flow of the logistics chain toward the market, while supply constitutes the upstream connection to sources and inputs. These two processes form inseparable and mutually dependent parts of a single logistics chain. Consequently, any analysis of distribution inherently implies a corresponding consideration of supply processes within the opposite segment of the chain.

In the scientific literature, one of the widely referenced definitions of distribution describes it as "*the set of operations by which goods or services are transferred from production to the consumer or user in the right quantity, quality, price, place, and time*" [26].

From the perspective of practical project implementation in the field of distribution, distribution can be further defined as "*a process involving various influences on goods and products, differing in nature and character, aimed at ensuring a coordinated flow in order to satisfy the requirements of customers, consumers, and users*" [3].

In contrast, supply is commonly understood in the literature as the set of activities ensuring the provision of materials, components, or goods from upstream sources to

production or distribution systems in accordance with required quantity, quality, time, and cost parameters.

From an application-oriented perspective, supply may be defined as "*a coordinated process of securing inputs and resources from upstream sources, encompassing procurement, sourcing, and inbound logistics activities, with the objective of ensuring continuity and efficiency of logistics flows*" [24].

Consequently, any analysis focused on distribution inherently implies a corresponding consideration of supply processes within the opposite segment of the logistics chain, and vice versa. This integrated perspective supports a holistic understanding of logistics flows and provides a consistent conceptual foundation for further analysis of distribution and supply logistics.

Distribution functions include:

• Purchasing products from manufacturers and organising the shipment and transportation of goods from points of production to points of consumption.

• Product fractionation, whereby customers receive goods in quantities, assortments, and forms that correspond to their specific requirements.

• Product regrouping, involving the consolidation and reassembly of dispersed or fragmented manufactured outputs.

• Storage of products across all transitional stages of distribution between production and final consumption.

• Offering products at points of sale.

• Selling products to consumers.

• Provision of supplementary activities and services, such as product delivery, installation, after-sales service, and ensuring that customers are adequately informed.

With respect to the spatial and temporal implementation of flows, distribution functions can be further classified according to their role in managing movement and coordination within the logistics chain [3,24]. This classification is illustrated in Figure 2.

Supply functions include:

• Identification and selection of suppliers capable of meeting required quality, quantity, cost, and delivery conditions.

• Procurement and purchasing of materials, components, and goods necessary for production or distribution activities.

• Organisation of inbound transportation from sources to production or distribution facilities.

• Consolidation and coordination of deliveries from multiple suppliers.

• Storage of inputs and materials at various stages of inbound logistics.

• Inventory management aimed at ensuring continuity of operations while minimizing associated costs.

• Management of supplier relationships and contractual arrangements.

• Provision of supporting activities such as quality control, information exchange, coordination of deliveries, and risk mitigation related to supply disruptions.

With respect to the spatial and temporal coordination of upstream flows, supply functions can be further classified according to their role in securing continuity, stability, and efficiency of logistics processes within the logistics chain.

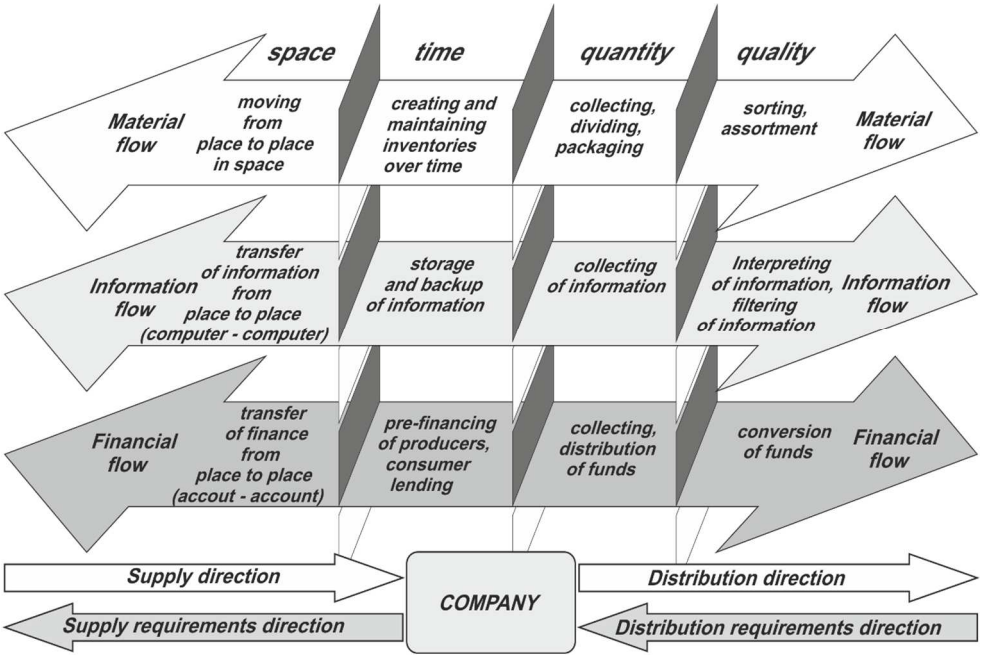

Figure 2 Basic distribution and supply functions in terms of flows of products, information and finances

Distribution entities, without which the implementation of distribution functions would not be possible, participate in specific product distribution processes. The fundamental distribution entities are manufacturers and consumers of products (Figure 3). Optional, facultative distribution entities include distributive procurers and distribution assistants, who perform various supporting functions within the distribution process.

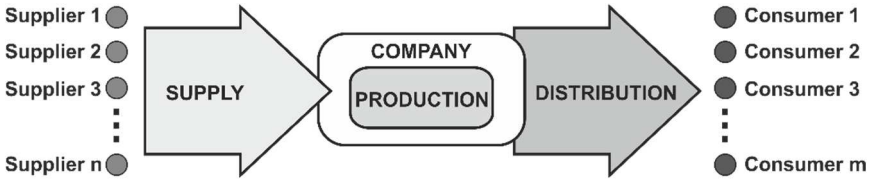

Figure 3 Flow of raw materials – supply, products flow – distribution
Source: author's conceptual model

The implementation of basic distribution functions is carried out by manufacturing companies, trading companies, advertising agencies, banks, and other distribution-oriented organisations. The primary objective of distribution is to organise the transport of goods and services in a manner that is fast, reliable, and efficient, thereby contributing to increased economic performance and profitability.

For distribution activities to be justified, there must exist flows of raw materials, semi-finished products, finished products, equipment, and other relevant items. A flow can be defined as follows:

"Flow is a moving and changing entity that alters its parameters in space and time. Flow arises as a result of a potential difference" [4].

The cause of a flow is the existence of a potential difference. In the context of distribution logistics, this potential difference is created by the presence of market supply and demand. An imbalance between supply and demand generates the necessity to satisfy market requirements through the distribution of products.

In distribution logistics, potential does not refer to a physical quantity but represents an economic and logistical condition that creates the preconditions for flow formation. It expresses a state of imbalance between supply and demand, availability and requirements, or sources and consumption.

A potential difference arises when goods, resources, or capacities are unevenly distributed in space and time, resulting in the need to transfer products, information, or financial resources. This difference acts as the driving force that initiates and sustains logistics flows.

Within distribution systems, potential is primarily generated by market mechanisms, where demand at one location and supply at another create conditions for movement within the logistics chain. The greater the potential difference between supply and demand, the higher the intensity and urgency of the resulting flow.

This concept of potential provides a theoretical explanation for the emergence of material, information, and financial flows in logistics systems and underpins the integrated interpretation of supply and distribution processes illustrated in Figure 4.

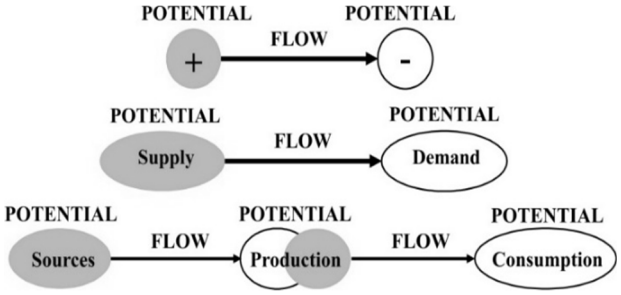

Figure 4 Formation of flow as a result of potential difference in distribution logistics

Distribution policy can be defined as *"the process of all strategic decisions that must be made regarding the route of a product or service from producers to final consumers or processors"* [27]. Distribution policy thus represents the foundation of the strategic dimension of distribution logistics.

The primary objective of distribution policy is to determine how a product can successfully enter and perform in the market and to define strategic goals aimed at achieving, maintaining, or strengthening the market position of a company. In this context, distribution policy seeks to create optimal synergy between production and consumption.

Strategic decisions within distribution policy focus on the selection of distribution channels, forms of wholesale and retail activities, purchasing organisations, and service providers. In contrast, operational decisions relate to the practical solutions for the physical movement of goods, as well as the coordination of information and financial flows.

Distribution policy also encompasses decisions concerning the implementation of activities required to overcome spatial, temporal, quantitative, and qualitative discrepancies that arise between production and consumption. In addition to distribution policy itself, other important components of distribution logistics include distribution channels, procurement activities, and the logistics subsystem supporting these processes.

The characteristics of distribution channels, or distribution chains (Figure 5), and their perception evolve over time and may be described from multiple

analytical perspectives. According to the APICS Dictionary, a distribution channel is defined as *"the distribution route, from raw materials through consumption, along which products travel"* [1].

From a traditional perspective, a distribution channel can be understood as *"a connection of producers, procurers, and consumers, without the inclusion of institutions, which performs specific functions such as market research and advertising within a market economy"* [26].

These activities do not directly perform the transfer of products or ownership from manufacturers to customers; instead, they support and facilitate the distribution process as ancillary activities, contributing to its overall efficiency and continuity.

From a systemic perspective, the distribution channel can be understood as a structured set of elements that collectively create material, information, and financial flows. In this sense, a distribution channel cannot exist independently of the entities that constitute the logistics chain and actively participate in its formation and operation.

According to the Council of Supply Chain Management Professionals, a logistics channel is defined as "*the network of supply chain participants engaged in storage, handling, transfer, transportation, and communications functions that contribute to the efficient flow of goods*" [25].

In a broader context, the concept of the supply chain encompasses the entire sequence of activities and entities involved in transforming raw materials into finished products delivered to final customers. The Council of Supply Chain Management Professionals defines the supply chain as follows:

"*Starting with unprocessed raw materials and ending with the final customer using the finished goods, the supply chain links many companies together. The material and informational interchanges in the logistical process stretch from the acquisition of raw materials to the delivery of finished products to the end user. All vendors, service providers, and customers are links in the supply chain*" [25].

An alternative perspective of the supply chain is represented by the demand chain, which emphasizes customer or end-user demand as the primary driving force pulling materials and products through the chain. According to CSCMP [25], demand chain management focuses on the proactive integration of demand-related information (customers, sales, marketing, and finance) with supply-side capabilities (operations and logistics management). The objective is to develop a consensus plan that effectively aligns requirements with capabilities and enables the satisfaction of customer needs within the constraints of supply chain resources. Demand planning systems support this process by identifying, aggregating, and prioritizing sources of demand across appropriate planning horizons and decision levels [25].

Figure 5 presents a conceptual example of a supply chain illustrating partial processes of supply and distribution logistics, as well as direct and indirect distribution channels across successive stages of production and consumption.

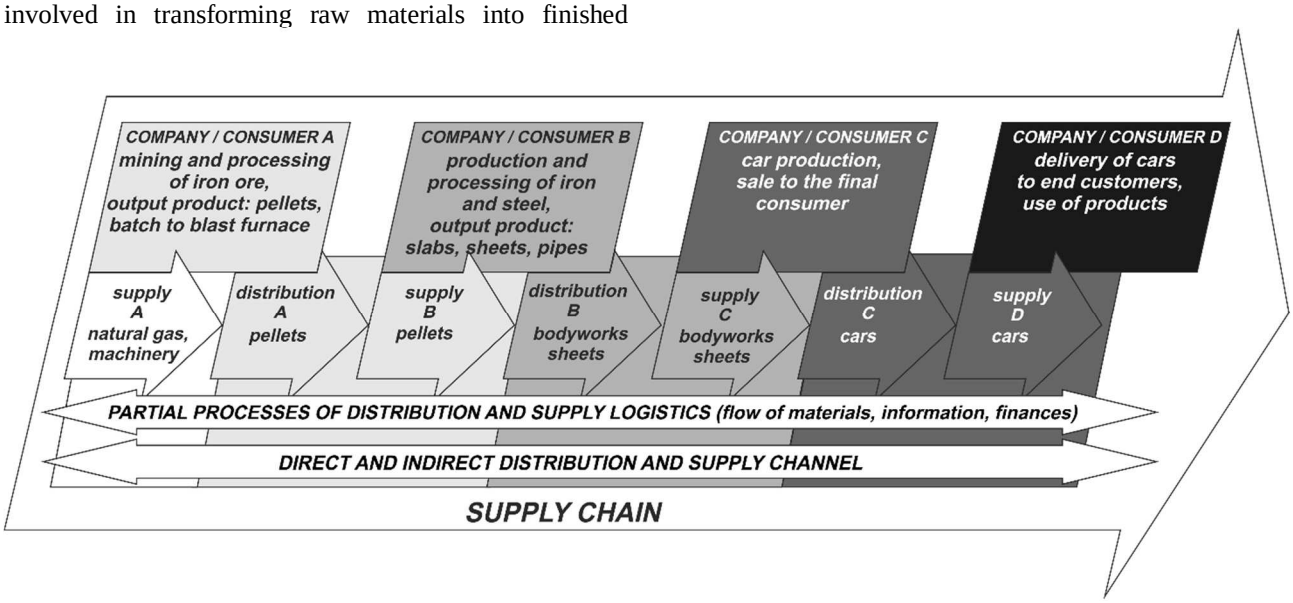

Figure 5 Conceptual representation of a supply chain illustrating partial processes of supply and distribution logistics and direct and indirect distribution channels
Source: author's conceptual model

In this representation, each company simultaneously acts as a consumer of inputs and a supplier of outputs, which explains the dual designation "company/consumer" used in the Figure 5.

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According to the APICS Dictionary, the demand chain is defined as:

"*A demand chain is composed of the enterprises that sell a business's goods or services. 2) The supply chain as seen from the viewpoint of the customer, the entity who chooses among competing products and services and thus controls the demand.*" [1].

In contrast, the supply chain is defined as "*the global network used to deliver products and services from raw materials to end customers through an engineered flow of information, physical distribution, and cash*" [1].

From a systems perspective, decisions made at individual levels of the supply or demand chain can lead to either improvement or deterioration of overall system performance. While some decisions may have only local effects within specific segments of logistics operations, others can significantly influence the performance of the entire system, either positively or negatively.

All other logistics-related activities primarily serve to support the functioning of the core supply chain. Although these supporting activities do not directly generate the main material flow, the effective operation of the supply chain would not be possible without them. The interactions among elements of an enterprise micrologistics model therefore play a critical role in ensuring the efficient functioning of logistics channels.

Figure 6 presents a systemic model of enterprise micrologistics embedded within logistics channels and the broader supply chain, illustrating interactions between supply, production, and distribution across consecutive companies. Each enterprise simultaneously acts as a recipient of inputs and a provider of outputs, while information, decision-making, and financial flows ensure coordination both within individual enterprises and across logistics channels. In this model, micrologistics represents internal enterprise logistics, whereas macrologistics reflects the broader external environment in which logistics channels and supply chains operate, including market mechanisms that generate demand and coordinate logistics flows.

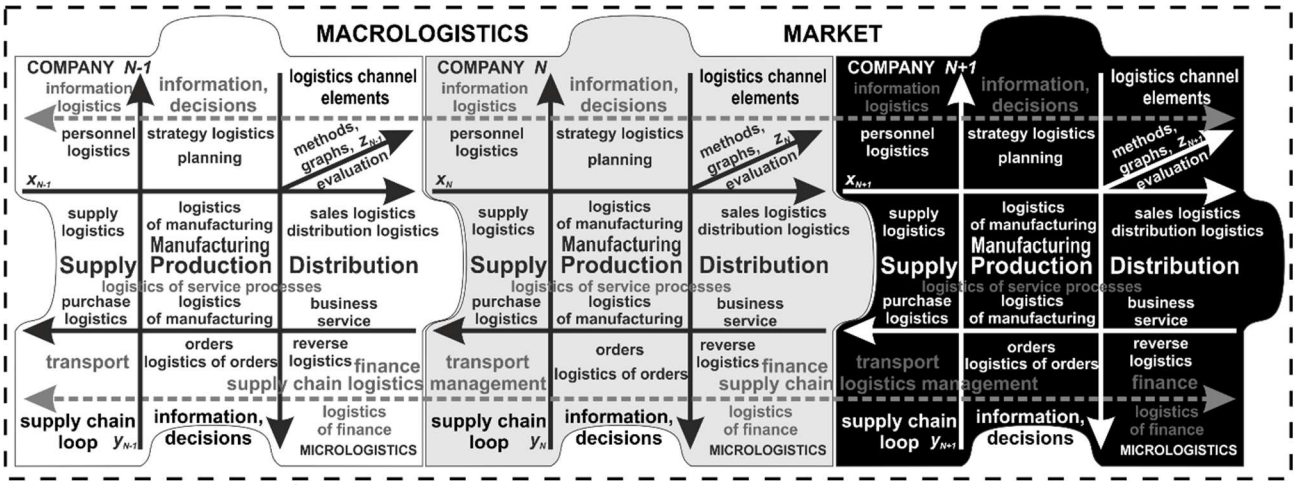

Figure 6 Systemic model of enterprise micrologistics embedded within logistics channels, supply chains, and the macrologistics market environment
Source: author's conceptual model

Along with the development of technical equipment and infrastructure supporting distribution, logistics as a discipline has gradually evolved, including the development of distribution logistics and its individual components. The traditional perception of distribution solely through the distribution channel is therefore no longer sufficient. From a supply chain perspective, it is necessary to consider not only distribution channels, but also the broader network of supplier–customer relationships operating at lower levels of the supply chain.

Within these lower segments, processes that form integral parts of distribution logistics are also implemented. The production of finished products and their delivery to final customers can be ensured only through the interconnection of these processes. The supply chain thus consists of interconnected sub-processes of supply and distribution, linking raw material suppliers, producers, and final consumers into a unified system.

The functions of the distribution channel (Figure 7) can be divided into preparatory functions and implementation functions. Preparatory functions do not directly result in a change of ownership of goods; however, without them, implementation functions could not be realized. These preparatory activities include market research, demand stimulation, establishment of business contacts, transformation activities, and negotiation processes.

Implementation functions, in contrast, directly result in a change of ownership of products and enable their participation in the market. These functions include physical distribution, financing, and the assumption of risks associated with market transactions.

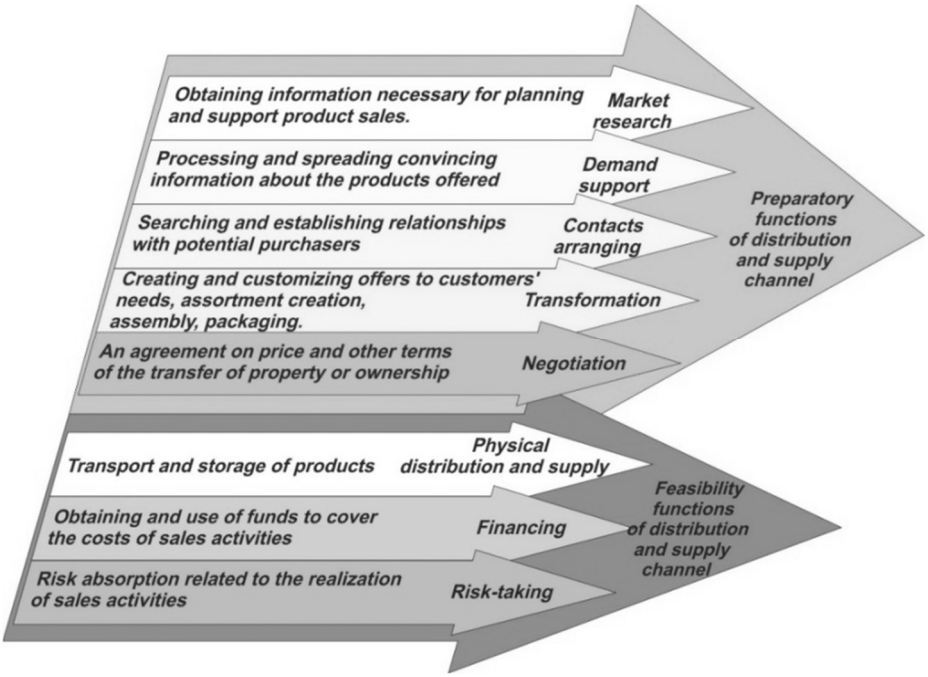

Figure 7 Preparatory and implementation functions of the distribution and supply channel

The implementation of distribution tasks involves several categories of participants, including:

a) producers performing specific distribution functions;
b) distribution procurers and trading companies;
c) distribution assistants, such as transportation and storage companies, as well as other supporting service providers;
d) final customers.

Depending on the interconnections among individual distribution participants, two principal functional subsystems of distribution can be distinguished:

- the acquisition distribution subsystem, and
- the logistics distribution subsystem.

The acquisition distribution subsystem is responsible for establishing juridical, economic, informational, and social relationships among distribution participants between whom goods are exchanged. Within this subsystem, decisions concerning the structure of distribution channels and the selection of distribution routes are made.

In contrast, the logistics distribution subsystem is oriented toward the physical transmission of goods in space and time, encompassing transportation and storage activities. Although these subsystems can be analytically distinguished, they do not operate independently. Instead, they function simultaneously and share several common distribution elements. The distribution system achieves its highest level of effectiveness only when both subsystems are synchronized and act in coordination within the distribution process.

Physical distribution referred primarily to the movement of finished goods, semi-finished products, materials, and other items intended for the market. The basic arrangement of physical supply and physical distribution within an enterprise is illustrated in Figure 8. Physical distribution and physical supply include activities related to the movement of goods and materials, storage, and order fulfilment. The management of physical distribution and physical supply is therefore executed predominantly at the operational level.

Physical distribution and physical supply address tasks defined by the day-to-day execution of distribution and supply activities. This operational level ensures the fulfilment of assigned tasks necessary for the effective performance of distribution and supply functions, such as selecting appropriate products, packaging, loading, transportation, and unloading of goods [3].

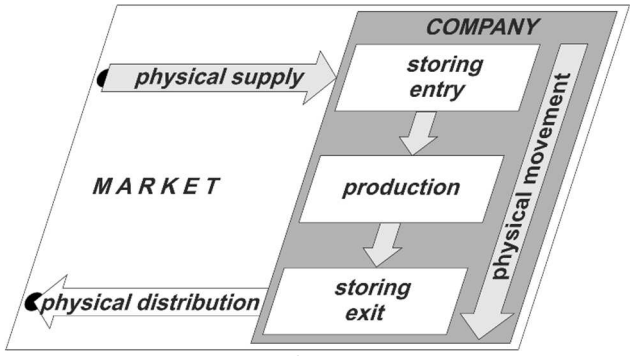

Figure 8 Arrangement of physical supply and physical distribution within the enterprise

5 Discussion

"Logistics should be understood as an integrated whole, closely associated with securing the continuity of the chain purchase – production – sales, or, in a more

logistics-oriented formulation, supply – production – distribution" [28]. This integrated interpretation is consistent with the systemic view of supply chain management proposed by [29], who conceptualize supply chains as coordinated networks of material, information, and financial flows spanning multiple organisational boundaries. Similar system-oriented interpretations are emphasized in more recent studies, which highlight the necessity of viewing supply chains as dynamic and interconnected systems rather than linear sequences of isolated activities [34,35].

The etymological origins of the terms distribution and supply further support their functional distinction within logistics systems. While distribution originates from Latin expressions referring to allocation, sorting, and integration, supply derives from terms emphasizing completion, replenishment, and assistance. Although linguistic roots alone do not determine contemporary meanings, they reflect historically embedded differences that continue to influence logistics terminology and conceptual interpretations in both academic and practical contexts.

When viewed together, distribution and supply represent complementary downstream and upstream segments of a single logistics chain. Distribution forms the interface between logistics systems and the market, whereas supply connects logistics systems with sources and inputs. These processes are inseparable and mutually dependent, as inefficiencies or disruptions in one segment directly affect the performance of the other. This interdependence reinforces the need to analyse distribution and supply within a unified conceptual framework rather than as isolated functional domains. The distinction between upstream supply processes and downstream distribution activities corresponds with the classical logistics framework described by [30], where inbound and outbound flows are treated as analytically distinct yet operationally interdependent components of logistics systems. Recent research further confirms that such interdependence plays a key role in supply chain resilience and adaptability, particularly under conditions of uncertainty and market volatility [34,36].

From an economic perspective, distribution performs two fundamental tasks: value creation and the balancing of supply and demand through the implementation of material and information flows between sources and consumers. Similarly, supply performs essential economic tasks by ensuring the availability of inputs and resources for production and distribution systems, while balancing demand requirements with sourcing capabilities through the coordination of upstream material, information, and financial flows. Together, these functions contribute to overall market efficiency and system stability, a relationship that is widely recognized in contemporary supply chain performance and resilience models [35,37].

The findings of this study are consistent with definitions and conceptual frameworks presented by established professional and academic sources. For example, APICS and the Council of Supply Chain Management Professionals emphasize the continuity of flows from raw materials to final customers and describe supply chains as integrated networks of material, information, and financial flows. The distinction between upstream and downstream processes identified in this study aligns with these perspectives, particularly in terms of supply focusing on inbound activities and distribution addressing outbound, market-oriented flows. The proposed conceptual framework also aligns with modern flow-based definitions of supply chains, which emphasize the coordinated management of flows across organisational boundaries and decision levels [34,38].

At the same time, the present analysis extends existing approaches by explicitly differentiating between distribution, supply, physical distribution, and physical supply as non-synonymous concepts occupying distinct positions within the logistics structure. While traditional definitions, such as those proposed by [26], emphasize the operational and market-oriented aspects of distribution, and professional glossaries primarily focus on flow continuity, the conceptual framework developed here integrates these perspectives into a coherent, system-oriented interpretation. The differentiation between physical execution and logistics management reflects earlier strategic interpretations of logistics, where operational execution was distinguished from higher-level coordination and decision-making [31], and is further supported by recent system-based logistics studies [35,39].

Compared with prior studies that predominantly interpret distribution through the distribution channel, the results highlight the necessity of perceiving distribution logistics within the broader supply chain context, including lower-level supplier–customer relationships and supporting subsystems. This integrated interpretation is consistent with systems-based logistics models proposed by [3], while further clarifying the internal structure of distribution logistics through the identification of acquisition and logistics distribution subsystems. Viewing distribution logistics as a system-level construct rather than a set of isolated activities is also consistent with contemporary organisational and network-based interpretations of supply chain management [32,36].

Overall, this comparison indicates that the proposed framework does not contradict existing theories, but rather synthesizes and systematizes them, offering enhanced conceptual clarity and supporting a more consistent application of logistics terminology in both research and practice. The results underline the importance of precise terminology in academic analysis as well as in practical decision-making, as conceptual overlap or inconsistent use of terms such as distribution, supply, and logistics channels may lead to errors in planning, strategic decision-making, and logistics system optimisation. From a process-oriented perspective, the identification of acquisition and logistics distribution subsystems corresponds with contemporary supply chain process frameworks that emphasize coordination across functional and organisational interfaces [33,38].

Furthermore, the role of flow—driven by potential differences between supply and demand—highlights the dynamic nature of logistics systems. Effective logistics performance requires synchronized subsystems, coordinated operational activities, and continuous adaptation to changing market conditions. This dynamic view is increasingly emphasized in recent supply chain research focusing on resilience, adaptability, and sustainability [34,37]. The conceptual framework developed in this study thus strengthens understanding of how distribution and supply jointly influence logistics performance and contribute to the efficiency, resilience, and sustainability of contemporary supply chains.

6 Conclusion

This article clarifies the conceptual and functional distinctions between distribution logistics and supply logistics and demonstrates their integrated nature within a unified logistics chain. The findings confirm that distribution and supply represent complementary yet distinct processes that are essential for ensuring coordinated flows of goods, information, and financial resources across logistics systems. A clear understanding of these relationships supports more precise terminology usage, improves communication among logistics professionals, and enhances both strategic and operational decision-making.

The study contributes a structured conceptual framework that is applicable to academic research, logistics education, and practical logistics system design. By systematizing existing theoretical approaches and professional definitions, the proposed framework provides a consistent basis for analysing distribution and supply logistics within contemporary supply chains. Future research may extend this work by incorporating empirical case studies or quantitative evaluations of logistics system performance, thereby further validating and refining the presented conceptual model.

The framework may also serve as a reference model for harmonizing terminology across logistics-related standards and educational curricula.

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