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Artificial Intelligence Systems for Smart Machine Learning A Literature Review

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Abstract— The term artificial intelligence (AI) originated in the 1950s as part of a project to artificially simulate and reproduce human brain processes, which, like many other projects, failed. More recently, however, in the 2000s, the term encompasses a much broader approach to the application of digital processing technologies to all aspects of individual and collective life, from the most intimate to the social, economic, learning, cultural, political, communication, and so on.

Indeed, the digital transformation of the logistics chain represents the most important evolution of the sector and remains a crucial issue for many transport players. In a highly competitive market, an efficient and flexible supply chain is a real asset. Companies are therefore looking for tools to optimize their processes and support decision-making in order to improve operational efficiency and customer satisfaction and reduce economic and environmental costs. This article aims to show that artificial intelligence is a powerful tool for logistics players, as it is able to intervene in all stages of the supply chain: from design to delivery of the product to the end customer. Given this emerging logic, it is interesting to ask what potential AI techniques can be used in supply chain management (SCM) research?

Keywords: Artificial Intelligence, Logistics, Supply Chain Management, market.

I. INTRODUCTION

The key challenge for many companies is to turn artificial intelligence (AI) into an asset that effectively transforms supply chain management (Dwivedi and al. 2021). Indeed, the supply chain plays a critical role in the quality of the customer experience, cost control, and business agility to market opportunities. Sometimes, the terms "extended supply chain" and "supply chain" are also used. The General Delegation for the French language, published in the Official Gazette of May 14, 2005, uses the following definition of supply chain: "The set of processes required to provide products or services." We can define the operation as a process that transforms resources (a raw material, an information) into other resources (a finished product, another information) by adding value to them.

Entrepreneurs have been buying things from suppliers and selling products to customers for almost as long as humans have lived on Earth. In fact, the concept of supply chain management was born in the early 1980s, but still depends on theories adapted by other disciplines (Carter, 2011; Stock, 2009). This is not new, as supply chain management research tends to cross disciplines

In 1982, Oliver and Weber pointed out that supply chain management encompasses the flow of products from suppliers to end users through production and distribution chains.

In other definitions, supply chain management is presented as a principle of management. The Council of Supply Chain Management Professionals offers the following definition, "Supply chain management involves the planning and management of all activities related to sourcing, processing, and logistics. It also includes coordination and collaboration with partners, which can be suppliers, intermediaries, vendors, and customers" (Chopra and Meindl 2010). SCM is an integration function whose main task is to integrate the different trades and the different processes within and between companies into a coherent and efficient model. In addition, SCM starts with understanding who your customers are and why they buy your product or service. Every time customers buy your products, they are solving a problem or fulfilling a need. Supply chain managers must understand the customer's problem or need and ensure that their company can solve that problem better, faster and cheaper than any of their competitors. SCM requires an understanding of the end-to-end system, the combination of people, processes and technologies that must work together to provide the best product or service based on need.

Companies are looking for speed, reliability, and traceability (Shearer et al., 2020). Likewise, they must consider their cost requirements, deadlines, and inventory optimization. In fact, what is good is the development and implementation of computers with amazing computational capabilities according to mathematically modelled algorithms that are able to process millions of data almost instantaneously to solve complex problems with accuracy and precision that are infallible. This technology obviously aims to overcome hesitations, delays, weaknesses, uncertainties, doubts, errors, in short, the limits of human intelligence

Given this emerging logic, it is interesting to ask: what are the potential artificial intelligence techniques that can be used in supply chain management (SCM) research?

The remainder of this article is organised as follows. First, we provide a brief introduction to the background literature on the study that highlights the relationship between AI and

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supply chain management (SCM) by highlighting some companies already using AI and practical findings.

Second, we describe the proposed AI-enabled supply chain management: the methodology of the proposed model, and third, in the conclusion, we discuss the results of the study along with the theoretical and managerial implications with the paper's contributions, limitations, and opportunities for future research.

II. LITERATURE REVIEW

2.1 Artificial Intelligence.

The immense power of AI is therefore due to the processing an ever-increasing amount of data obtained by the development of the Internet, in particular by research networks and social networks that are able to collect and remember a memorize a very large amount of information about individuals and groups. We will move forward as well as robots are unbeatable at chess. The question therefore arises as to what is refers to intelligence when talking about artificial intelligence. What This is mainly the fact that algorithmic technology is able to spot its own errors and correct them, so that it is in some sense capable of learning and even implementing works solutions that were not modelled at the beginning. This is the status of machine learning: "The real breakthrough that explains the massification of AI techniques and the popularity of this term occurred in the Turn of the century, when computer systems became able to learn on their own without following predetermined rules.

Three factors explain this comeback: the abundance of data thanks to the Internet, the staggering increase in computer power, and the rediscovery of "neural networks", (Holzmann, V and al, 2022). A certain way of building computer connections by making the processing points of data that is highly interdependent on each other, much like the neurons in our brain. Machine learning can give rise to several procedures depending on the degree of human intervention: supervised learning, reinforcement learning, unsupervised learning, or deep learning: "To identify a cat in an image, for example, we can use Deep supervised learning".

As a result, supply chain managers work to monitor and avoid incidents and disruptions to the procurement process. Bad weather, delivery delays and quality defects are the most common incidents (FAO 2021). On the other hand, major events can occur suddenly such as political unrest, natural disasters or financial instability of suppliers (Horns' and al (2020)).

Supply chain management (SCM) is a critical function of the company. It represents a very significant part of the costs: from 60% to 90% of the costs of an industrial company. It's the main responsible for the impact of companies on the environment: transport of goods, for example, alone consumes 15 million barrels of oil per day, i.e., approximately 20% of global production. The supply chain management enabled many groups to gain a competitive advantage decisive: Walmart, Inditex (Zara brand) or even Amazon are known examples (Mackinsey & Company 2020; Deloitte 2020; Ernst & Young 2020).

Yet supply chain management is often difficult to understand for business leaders and operational managers.

- Difficult to understand because supply chain management covers many functions: purchasing, supply, production, maintenance, sales, management of stocks and product flows, management warehouses, transport.
- Difficult to understand because supply chain management often assumes the knowledge of many methods: shared management procurement, 5S method, Kanban method, method SMED, value stream mapping, Kaizen approach, PDCA cycle.

2.2 Machine learning

Manufacturers in the manufacturing sector have been slow to deploy machine learning in their business processes, even though it would have a positive impact – especially for the supply chain – on the company's results. Machine learning is a type of artificial intelligence (AI) that gives computer systems the ability to learn without programming. We need to ask the question what is the machine learning and what relationship with the artificial intelligence?

What makes AI different from traditional computing is that with AI, the computer doesn't need to be told exactly how to do something. Instead, the computer is able to start with it responds over time. This process is called machine learning. A computer program that is designed to with AI to perform a certain task is called and intelligent agent. An example of an intelligent agent that uses machine learning to get better over time is Apple's Siri voice recognition system.

This technology is now widely present in our daily lives. Facebook News Feeds, credit card fraud alerts are just a few examples based on machine learning; thus, Mark Zuckerberg's social network relies on the "likes" of its users to offer them content that may be relevant to them, banks can react immediately when a suspicious transaction is made on their customers' accounts.

What do the many applications of machine learning have in common? The data! These are now more available than ever, but in practice, companies have not really prepared themselves to manage this incredible influx of information and transform it to improve their business processes. Fortunately, adjusting these processes coupled with the right technology investments can help companies adapt to these new requirements. Manufacturing manufacturers in particular have been slow to deploy machine learning to run their business processes. Yet, there are activities like after-sales service where machine learning has a positive impact on business results and customer experience. For organizations with after-sales service, it is very common for planners and suppliers to lack visibility into the supply or

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demand of parts between different storage locations; This generates problems with the accuracy of forecasts and maintenance of stocks, and therefore additional costs. Adopting technologies that incorporate machine learning allows manufacturers better control, visibility, and more efficient processes for redistributing spare parts inventory. These dedicated solutions eliminate overstock and allow warehouses to work with each other rather than independently in their own silo to meet demand. This results in high product availability rates and better service delivery for customers.

When a new product is brought to market, there is no historical data to predict when certain parts will need to be replaced or repaired. Distortions between parts availability and customer expectations can be costly in a fierce competitive environment.

Machine learning solves these problems by using algorithms and analytics to track and determine the success of a launch, integrating data from sales, social media comments, web traffic, and many other sources. This gives companies the ability to know when and where parts need to be ordered and stored, eliminating overstock and overall costs, while improving customer satisfaction.

For parts pricing, companies should take into account the various factors that can be used to improve sales, including parts location, seasonality, weather or type of demand. With machine learning capabilities, they can integrate these different factors and more to automatically adjust prices as the market changes.

Machine learning is the next step in business intelligence applied to the supply chain and more specifically to after-sales services. Although the adoption of this technology is still low, it will prevail in the coming years, especially since this sector depends on forecasting models and trend analysis.

2.3 Logistics

The word logistics has seen its definition evolve, since its creation in 1836. Until the early 1900s, it was mainly used in the military field. The American Marketing Association suggested in 1935, in Marketing Vocabulary, one of the first definitions of logistics: “Logistics includes the various activities carried out by an enterprise, including service activities, during the transfer of a product from the production site to the consumption site”. The National Council of Physical Distribution Management (NCPDM), which in 1985 became the Council of Logistics Management (CLM) then, in 2004 the Council of Supply Chain Management Professionals (CSCMP), proposed a broader definition including supplies and transportation: “The process of planning, executing and controlling procedures for transporting and storing goods and services effective and efficient, and associated information, from the point of origin to point of consumption in order to meet customer needs.

It includes all the logistics management activities mentioned above as well as production operations (Fosso Wamba et al. 2021; Dubey et al. 2020; Grover, Kar, and Dwivedi 2020), and oversees the coordination of processes and activities within and between marketing, sales, product development, finance, and information technology”. A definition, which presents supply chain management, is frequently used: “The process of obtaining the right product in the right place at the right time and at the best cost”. The chain logistics do not only deal with supply, but also with Requirement. They are more often organized in a network than in a chain. There are three types of logistics. First, Inbound logistics, or supply logistics, is "all activities related to the reception, storage and distribution (within the company) of raw materials and components, such as the handling of goods, the management of warehouses, inventory control, transportation scheduling and back to suppliers. Second, Internal logistics is the set of activities related to the delivery of products within the company (Ballou 2007). Third, Outbound logistics is “all activities related to the collection, storage and distribution of products to buyers, such as the management of finished product warehouses, the handling of goods, the operation of transport vehicles delivery, processing and scheduling of orders”. For long term it called physical distribution. Materials management is “the set of management functions that support the end-to-end product flow cycle. end, from the supply and internal control of raw materials to the planning and control of work in progress and to warehousing, shipping and distribution of finished products. In France, the term “logistics” appeared for the first time in 1836 in the book “the art of war”, written by an officer of Napoleon, Baron Antoine-Henri Jomini. In the chapter “On logistics or practical art of moving armies", Jomini described in eighteen points the main logistics activities. These activities covered, for example, planning (Point no. 1: “Have all the material objects necessary to set the army in motion, that is to say to open the campaign. Trace orders, instructions and routes to collect it and then put it into action”).

According to Schary and Becker (1973), the distribution strategy, through the indicator of availability of the goods, must be adapted to the different market segments. Likewise, Christopher and Wills (1974) propose segment a company's customer base to identify groups with consistent service expectations. As it appears, the role of the logistics function is then to coordinate the different functional activities of the company in order to achieve the objectives set. In fact, this view is similar to that expressed by Manrodt and Davis (1992) for whom Logistics should not be limited to transport operations, stock tracking or availability of the product but must be the means of coordinating and integrating. Different functions of the company involved in customer satisfaction. It is in this lineage that we must inscribe the work on "Mass-customization" (or "personalization") mass"). Gooley (1998) does not hesitate to assert that the company's ability to formulate a specific offer to respond to the particular expectations of a customer is not conceivable only if it has

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efficient logistics. Whith Gooley (1998), the Logistic term covers the coordination of order management, production and distribution. Tarondeau (1998) has a close vision to Gooley even if he does not explicitly use the term "logistics" but prefers the term " transversal organization ". We can cite different empirical studies about logistics for example with the author Gilmour (1977) shows, based on a study carried out on the supply of scientific equipment, that the expectations of different customers (schools, universities, private companies, public services, hospitals, etc.) are distinct in terms of service.

Some market segments, such as private companies, prioritize availability goods, the delivery time, and the reliability of it. Others, such as utilities, place importance on after-sales service, technical competence of the sellers and demonstrations made by these.

So, Gilmour (1977) states that Maintaining a certain level of quality of service is often costly for the company agrees, then, to offer a level of service specific to each market segment.

2.4 The relation between the Artificial intelligence and the supply chain:

Supply chains are made up of people, processes, and technologies. All three components need to improve over time for a supply chain to remain competitive. People get better through education, training, and experience. Technology gets better through improvements in hardware and software. artificial intelligence gets better through innovation and process improvement.

There are three challenges: This article proposes to cite three supply chain issues that the use of Artificial Intelligence makes it possible to optimize.

Artificial Intelligence, a competitive advantage

Artificial Intelligence is a very promising technology for supply chain optimization. Indeed, it makes it possible to process and correlate a large amount of data, to facilitate understanding nand to anticipate the impacts of external events.

By improving all supply chain processes, it provides better visibility throughout the supply chain. This improves decision-making (Baryannis et al. 2019) and makes it more agile.

Act faster and better control incidents

Artificial intelligence makes it possible to implement predictive approaches. They allow for rapid assessment and more effective downtime of risks or disruptive events that could occur throughout the supply chain. Therefore, the management of crisis situations can be reduced from a few days to a few minutes.

With AI, supply chain managers can reduce, identify key information, and gain the visibility needed to respond quickly to any incident.

In addition, the use of Artificial Intelligence makes it possible to analyse the operational and financial consequences of a potential event. The power of this technology makes it possible to correlate all relevant information's about a supplier or customer. You get a 360° impact analysis very quickly. Supply Chain managers' decision-making is therefore based on business challenges, customer expectations and a comprehensive impact study.

Business knowledge and experience

Artificial intelligence is transforming the supply chain through machine learning by offering dedicated business solutions. Supply chain management solutions include a repository of business best practices. Over time, AI perfects their "knowledge" by learning how logistical problems are solved.

The solution is therefore constantly being refined to react more accurately and efficiently to different events.

The benefits of a thoughtful supply chain

From accurately analysing events to reducing operational costs, AI is driving the deployment of an intelligent, more agile, customer-centric supply chain.

By facilitating the management, management and optimization of the supply chain, Artificial Intelligence re-allocates resources more efficiently. The production environment must take into account the "theory of constraints". This theory aims to improve the functioning of the business by identifying and managing the processes that relieve bottlenecks. In fact, the basic idea of this theory is limited to some constraint (A chain is only as strong as its weakest link).

It was developed by Professor Eliyahu M. Goldratt, who had commercialized (in 1979) OPT (Optimized Production Technology) production scheduling software to balance flows rather than capacities.

In 1984, he wrote a novel, The Goal, to promote his software, the story of a plant manager who must improve the performance of his site.

The theory of constraints starts from the premise that the goal of the company is to make money, and that there is always at least one process called "bottleneck", That is why it is imperative to improve this process and therefore the overall process, to generate more gains.

The theory of constraints develops several methods and propose the use of problem-solving, management and decision support tools.

A 5-step approach:

Step 1: Identify the constraint that is the bottleneck.

Step 2: Identify solutions to maximize the use of the constraint.

Step 3: Coerce all other processes.

Step 4: Increase the capacity of the stress.

Step 5: The process continues to identify and improve new bottlenecks.

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The Artificial Intelligence and the internet of things.

One of the key drivers of improvements in supply chain visibility is the emergence of the internet of Things (IoT). Today, there are more than twice as many devices connected to the Internet as there are people in the world, and IoT devices are growing at about 20 percent per year. A good example of an IoT that is useful in supply chain are the GPS or the trackers. The growth of supply chain information systems and the emergence of the IoT have contributed to another trend that's necessaire for digital supply chains is the Big Data because it can help corporates to better understand the need of their customers, their products and their infrastructure.

III. SUPPLY CHAIN MANAGEMENT

The supply chain Management constitute different domain:

3.1 Supply chain reengineering:

Reengineering was conceptualized and disseminated by Michael Hammer and James Champy through their book "The reengineering of the corporate" [Hammer and Champy, 1993]. The authors support the need to carry out radical transformations in the modes of functioning insofar as the business environment changes rapidly, beyond what its ability to adjust allows, making the methods of piloting and outdated performance rules.

Reengineering (or Business Process Engineering) is defined as a fundamental questioning and radical reconfiguration of operational processes business to achieve significant gains in critical performance that today constitute costs, quality, service and speed [Hammer and Champy,1993].

The principle underlying a reengineering action is simple: the organization is entirely oriented towards the satisfaction of customer needs through the production of goods and services intended for the latter [Jacob, 1994]. According to [Davenport and Short, 1990], the reengineering analyses and structures the flows and processes in and between organizations. The action of reengineering is based on defragmentation and simplification of processes [Giard, 2003].

It should be noted that reengineering is often associated with an action to set up or overhaul of information systems. Indeed, the implementation of ERP often requires, at least preliminary, a questioning of the existing processes.

3.2 Supply chain collaboration:

The collaboration is based on a dynamic in which the partners strive to maximize their cumulative benefits by seeking to obtain the gains. In other words, companies collaborate with each other only when they are sure that they can achieve financial and non-financial gains, while having confidence in their partners. Firms need to understand the performance dimensions of the collaborative relationship to effectively manage their portfolio, to argue for sufficient action to share corporate resources (Srivastava, Fahey, & Christensen, 2001) and for competitive advantages. In reality, collaboration in a supply chain can be defined with different fields of application such as decisions, information systems, processes. Collaboration is a management of interdependence in a supply chain. It is a driving force between two or more organizations that share responsibilities for planning, managing and executing or evaluating an activity (Min et al. 2005)

3.3 Supply chain Agility:

This model is best for companies with unpredictable demand or customer-order products. This model prioritizes flexibility, as a company may have a specific need at any given moment and must be prepared to pivot accordingly. The term agility is generally defined in the literature as a rapid response to change. This concept is often used in operational problems. Nevertheless, given the complexity of supply chains due to the multitude of actors and the difficulty of managing all this simultaneously, the objective of reacting quickly to unexpected events seems difficult to put on implemented. Companies should therefore focus on physical flows (organisations, raw materials, installations, etc.) and information flows (Information systems) in order to seek to make more manageable supply chains (Ching and al., 2006). (Christopher and al., 2006) distinguish keys for ensure this agility. They cite responsiveness, competence, as well as speed as levers for the entire logistics infrastructure in order to determine the level of agility. That said, they consider that flexibility is the main characteristic of a nimble business. Admittedly, flexibility has been subject to of several research at the level of the design and the manufacture of products (Koste and Malhotra, 1999) but in recent years, researchers are beginning to take more interest in this concept supply chain level. As a result, several definitions have been proposed in the literature. (Ivanov and al., 2010) define supply chain flexibility as a property that concerns the ability to change quickly, structurally and in a functional way in response to a change in the behavior and structure of the logistics network. (David Simchi-Levi 2004) equates the definition of flexibility to the reduction target costs and deadlines. (Chan and Chan, 2010) present a study which shows the role that flexibility plays in improving performance of the supply chain at the level of the supply and delivery of products in order to adapt quickly to changes. The network studied is a two-link supply chain composed of a set of suppliers and customers for the case of multiple products. A multi-agent system is used in this study to model supply chain operations for each period T. The variations studied relate to the supplier capabilities.

3.4 Supply chain risk management culture:

Many operations are required, and the logistics process is broken down into multiple interventions: rack supply, storage, picking, packing, loading, and shipping. Managing a supply

chain means being aware of risks and implementing process work smoothly, but risk management is the key to avoiding or minimizing the costs of dealing with surprises: So, risk, management can provide opportunities to capture value during times of uncertainty.

The results of an empirical study of French companies conducted by [Lavastre et al 2014] show the importance of supply risk, which is ranked first in terms of companies' perception of risk criticality. This perception has an impact on the behaviour of decision-makers in the procurement process and their relations with their suppliers.

[Gurnani et al, 2013] proposes to explore the realistic supply context in order to observe the behaviour of professionals in the retail supply chain. It is within this framework that our research is integrated.

3.5 Advantages of Artificial Intelligence and Supply Chain:

Logistics covers everything related to moving and storing products, it involves physical distribution, warehousing, transportation, and traffic. Inbound logistics refers to the products that you ship to the customers. Logistics adds value because it gets a product where a customer needs it. Logistics costs money too, transporting products on trucks, trains, and airplanes has a price tag. The goals of the logistics function are to move things faster, reduce transportation costs, and decrease inventory. There are some advantages about supply chain logistic like for example consolidation of many small shipments into one large shipment to lower shipping costs. And, breaking large shipments into smaller one to increase velocity. In addition, outsourcing logistics services to a third-party logistics 3PL company can be an advantage too.

IV. DISCUSSION

However, current requirements for building Agile supply chains in a flexible context require methods that are more efficient and more adapted to unpredictable variations. Until now, the works which have been interested in the uncertainties or the variability of the data in the

supply chain has made the assumption of a good knowledge of data variation to be able to use stochastic optimization methods or sturdy. However, in a context characterized by market fluctuations, variations in data may occur at any time and are difficult to predict. We are therefore in the obligation to seek new methods to be able to optimize in this environment.

V. CONCLUSION

In all areas, AI promises order without disorder, efficiency that can never be faulted, and performance that is always assured in advance. Human intelligence cannot compete with AI. If human intelligence is defined by reasoning, that is, by the ability to think, understand, and judge, then there is no intelligence in AI other than the one that designs the algorithms and applies them to specific domains, depending on whether they come from public institutions or private companies.

But the human intelligence remains in the background, forgetting itself as if fascinated by the wonders of its creature. Worse, behind the mirror of AI performance there is also a whole phantom or invisible lumpenproletariat that must remain so: "What do the AI workers do? For anyone [...] They are housewives in India, the physically disabled in Europe, the unemployed in the United States, in short, all those who want or need to work from home to earn a minimum income. Their job ranges from labelling simple pictures (a cat...) to solving mathematical problems through vibration analysis. It's the beating heart of the digital proletariat, where freelancers take turns with ephemeral tasks. "But these have to remain hidden, as do the designers. algorithms. This is the prerequisite for the myth of AI's neutrality to be credible. Contrary to what we would like to believe the AI promoters, but also those responsible in the administration (private companies or public institutions, such as universities).

The benefits of artificial intelligence in supply chain management are critical. Artificial intelligence is an everyday supply chain technology as companies of all levels and sizes have adopted its extensive applications. Given current developments, any supply chain business model must critically integrate with AI and analytics solutions for optimization

Companies that have invested in artificial intelligence for transportation and logistics have seen their profit margins increase by more than 5%. According to a study by IBM, only 10% of current systems are equipped with artificial intelligence, so there is still a lot of room for improvement.

Implications and contribution to the community

We look forward to using this article to help industry professionals, policymakers, academics, and all stakeholders in the field gain more knowledge about AI applications and insights related to supply chain management. Artificial intelligence applications in logistics are still in development but are expected to reach their full potential in the coming years to Predicting consumer trends. Artificial intelligence uses Big Data for logistics purposes: it compares internal information, such as sales histories, with data from forums, social networks or other Internet sources. In this way, the system is able to make assumptions about users' consumption intentions and thus predict demand behavior. In this way, it is possible to set up predictive logistics and avoid stockouts or the storage of surplus goods. This is one way to reduce the waste of resources.

Automation of warehouse operations. One of the most important examples of artificial intelligence in logistics is automated warehouses. They combine two basic systems: warehouse robots and management software. Together, they enable logistics that integrates transportation and warehouse movements as well as operations management. From this joint work, models emerge over time. In this way, artificial

intelligence helps optimize resources and correct movements in the event of flow fluctuations.

Generate the most profitable transport routes. Coordinating logistical transport becomes easier with AI. On the one hand, the WMS creates a digital X-ray image of the company's facilities and records all the intralogistics movements that occur. AI processes this data and organizes the movements, both of self-driving vehicles that adapt to the environment and of operators who use handling equipment to adjust the route as needed. On the other hand, the AI also manages transportation fleets by interpreting current traffic information and integrating it into local systems In this way, the software determines the most favorable routes for the delivery of different goods and corrects the routes in real time in case of incidents. Improving information control in the supply chain. Process automation in the supply chain, complemented by artificial intelligence, enables real-time inventory management, immediate issuance of delivery orders or accurate order tracking, among other things. Integrating data and improving traceability systems also make it possible to meet users' knowledge needs. For example, the frequently asked question of where the package purchased in e-commerce is located can be solved quickly and efficiently through the use of chatbots with artificial intelligence.

Limitations of the article: AI is the foundation of a new generation of technologies that can help solve complex logistics and supply chain problems. The application areas are very numerous and diverse, just waiting to be explored. Since this type of technology is a black box that is difficult to explain, needs an agile approach to experimentation and testing is needed to unlock its potential and validate its results.

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