

# IoT AND BLOCKCHAIN - A NEW PARADIGM FOR SUPPLIER MANAGEMENT IN MANUFACTURING PLANTS

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## ABSTRACT

*This paper discusses how the combination of Internet of Things (IoT) and Blockchain technology can create a new paradigm for supplier management in manufacturing plants. IoT enables the comprehensive digitalization of an entire manufacturing plant while providing a trove of data about the daily operations and performance of suppliers, machine performances, and other related activities. Blockchain technology provides a distributed ledger technology to store, share, and manage this data with trust and security, ensuring that all stakeholders within the supply chain are accountable and have an immutable record of their activities and performance. The paper discusses the potential opportunities and benefits that this new paradigm promises for manufacturers through improved supplier management, automated processes, reduced costs, and enhanced transparency. It also examines the challenges associated with making this system functional such as legal issues, system integration, and security concerns. Finally, the paper provides an overview of potential uses of this technology and concludes with a discussion of the future prospects of using IoT and Blockchain in supplier management.*

## KEYWORDS

*IoT, Blockchain, technology, ledger, supply chain, transparency*

## 1. INTRODUCTION

The Internet of Things (IoT) and blockchain are technologies that are disrupting traditional supplier management processes in manufacturing plants and providing new tools to enable more effective, efficient, and secure management of supplier relations. IoT allows for data and system integration in the supply chain by connecting machines, sensors, applications, and other systems within the manufacturing plant and beyond and collecting data on supplier activities. This data is then transferred and analyzed using blockchain to automatically create and store supplier records and contract agreements in a secure, collaborative platform [1]. By utilizing both technologies, manufacturers are able to simplify and expand supplier management processes to include improved inventory and production tracking and an increase in the rate of vendor-to-customer communication, leading to better decision making in the procurement process. IoT enabled sensors are connected to various network devices in the plant, such as robots, machines, and inventory systems, which allow data to be tracked and analyzed in real-time. This data can be used by the supplier management team to manage automated processes, such as ordering parts and materials and tracking the performance of suppliers. This also leads to a reduction in manual processes, leading to cost savings for the manufacturer. Additionally, manufacturers can use predictive analytics and machine learning to analyze the data to identify potential problems in the supply chain that can then be addressed before they become issues [2]. On the other hand,

blockchain provides a decentralized ledger that serves as a secure platform to store supplier data and agreements, eliminating the need for manual entry or human verification. This reduces administrative burden and costs, as well as eliminates the need for third party auditors or intermediaries. All members of the supply chain are afforded a secure, transparent platform to access and share information, leading to efficiency in the vendor-customer relationship. Furthermore, blockchain provides a tamper-proof system for tracking information and ensuring that the data is accurate, secure, and reliable [3]. The combination of IoT and blockchain provide manufacturers with a comprehensive suite of tools to effectively and securely manage supplier relations, from ordering and tracking inventory to automating contracts. By eliminating manual processes and streamlining the supply chain, manufacturers are able to gain greater visibility into their supplier performance and strengthen their vendor-customer relationships, ultimately leading to increased efficiency and cost savings. The Internet of Things (IoT) and Blockchain have been making waves in the industry lately and, together, have the potential to transform the way companies manage their suppliers within their manufacturing plants. IoT technology allows for real-time data collection and transmission while the decentralized ledger of Blockchain technology eliminates the need for a third party to facilitate trust between parties. In combination, these technologies open a new era of supplier management – offering immense opportunities for streamlining processes, increasing insight and driving operational success. One of the key benefits that IoT and Blockchain can provide in supplier management is improved visibility [4]. In a manufacturing scenario, ground-level asset and product tracking can be achieved through a combination of radio-frequency identification (RFID) tags and Blockchain technology. Placing RFID tags on goods and assets enables companies to track their physical movements in real-time anywhere in their facility. The construction diagram has shown in the following fig.1

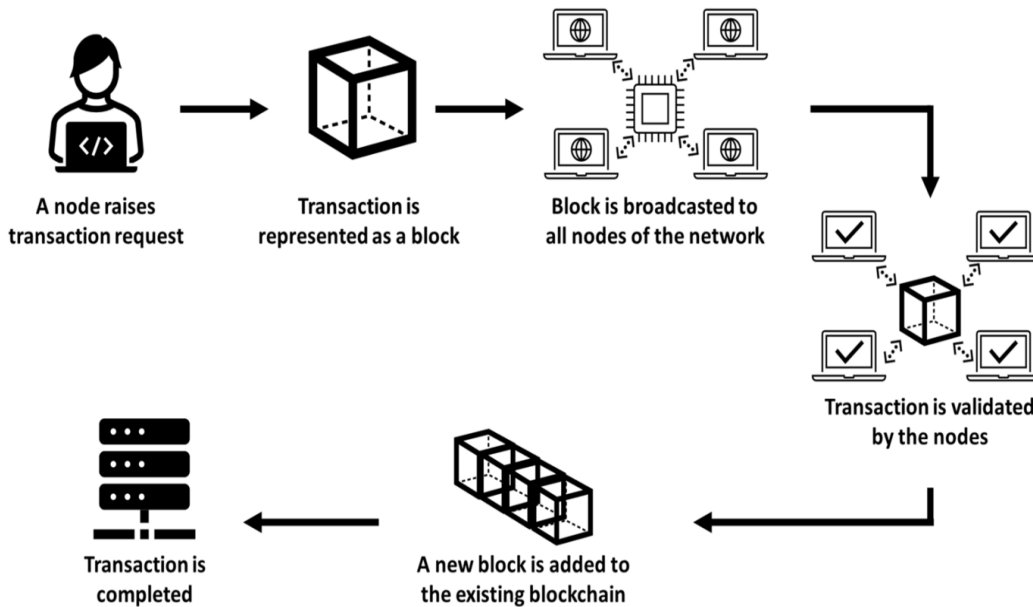


Fig 1: Construction diagram

Asset and product tracking also eliminates mishandling and incorrect deliveries and is invaluable in ensuring product quality and reliability. In addition, IoT and Blockchain can help companies capture pertinent information about their suppliers and assess them through a digital ledger that is accessible to all parties. In addition to visibility, IoT and Blockchain can enable companies to significantly improve their purchasing processes. Automated purchasing processes enable companies to save time and money by eliminating manual paperwork and redundant databases,

while letting companies keep better control over their spending [5]. With Blockchain technology, companies can easily check the provenance of their suppliers and create detailed smart contracts to guarantee adherence to quality guidelines. Further, companies can digitally store third-party certificates and performance information which can then be used for making informed decisions related to their suppliers. The use of IoT and Blockchain also bring the potential to build stronger supplier relationships. By accessing real-time data from IoT enabled devices, companies can streamline operations and easily collaborate with their supplier networks. In addition, the introduction of smart contracts creates greater transparency between companies and suppliers and helps create a trust-based relationship [6]. IoT and Blockchain technology have been gaining traction as businesses continue to explore the immense opportunities they offer. This new paradigm for supplier management in manufacturing plants promises to revolutionize the way businesses source and work with suppliers. IoT and Blockchain technology can provide companies with unparalleled visibility, increased efficiency, better process control and more effective relationship management – allowing companies to take the competitive advantage and derive maximum return on their investments. The main contribution of the research has the following,

- Reduction of operational costs: By implementing a decentralized ledger system, manufacturing plants can reduce operational costs associated with supply chain management since they can better track, analyze, and store data.
- Increased security and trust: By utilizing Blockchain technology, manufacturing plants can ensure a secure, reliable, and trustworthy environment for their entire supplier network.
- Greater visibility and control: With real-time dataflow, IoT-enabled devices, and layer-2 Blockchain technology, manufacturers can gain greater visibility and control over their entire supplier network.
- Streamlined traceability: With Blockchain-enabled traceability, manufacturers can effectively trace and audit products from source to destination.
- Automated payments: IoT and Blockchain can automate payments - from suppliers to manufacturers - with smart contracts that can store and track financial transactions [7].

## **2. LITERATURE REVIEW**

The convergence of Internet of Things (IoT) and Blockchain technology is ushering in a new era of digital transformation for the manufacturing industry. By utilizing distributed ledger technology, it is possible to securely record and share information across transactional boundaries and create trust between multiple stakeholders. This shift in technology has revolutionized how manufacturers manage suppliers and supply chains, creating a new paradigm for supplier management in manufacturing plants. IoT and Blockchain are especially useful when it comes to tracking the goods and materials that suppliers provide to manufacturing plants. Utilizing these technologies, manufacturers can effectively manage and monitor the delivery of goods in real-time, ensuring that material arrives when it is, in the necessary quantity and of the expected quality [8]. Manufacturers can also use the technology to create smart contracts with suppliers that securely and automatically certify the terms of a deal when certain conditions are met, such as timely delivery or when a specific product is ordered. Furthermore, Blockchain and IoT can be used to reduce supplier fraud, such as counterfeit products or tampering of records. By using digital signatures that are cryptographically linked to the transaction records, manufacturers can increase the security of their supply chains and supplier management processes, reducing the risk of any vulnerabilities being exploited. Similarly, the data recorded on the Blockchain can be analyzed by machine learning algorithms to identify anomalies or potential threats in the system that could be linked to supplier fraud [9]. The integration of Blockchain and IoT technology into

manufacturing plant's supplier management practices is revolutionizing the industry. By leveraging the security and transparency of Blockchain and the real-time monitoring of IoT, manufacturers can ensure the goods and materials they receive are genuine, timely and of expected quality. As more businesses join this new paradigm of supplier management, the efficiencies of Blockchain and IoT will become further evident, offering a new level of trust and collaboration amongst stakeholders. The Internet of Things (IoT) and Blockchain are two of the most talked-about technologies of the modern era. Companies are taking advantage of their capabilities to help streamline operations and reduce costs. However, while both tech solutions can help companies in their transformation to digital, many of these initiatives are limited either due to traditional supply chain processes or complex cross-border transactions [10]. This is why IoT and Blockchain have become increasingly popular for supplier management in manufacturing plants. With an IoT and Blockchain-enabled supplier management system, manufacturers are given the ability to track the flow of goods and services to their production facilities with greater accuracy, transparency, and scalability. Such a system creates a comprehensive database of suppliers, shipments, product lifecycles, and fulfillment paths that enables manufacturers to better manage their supply relationships and consolidate their costs. The benefits of an IoT and Blockchain-based supplier management system are plentiful. Companies can utilize the system to track suppliers' current and future inventory status, payment and delivery terms, and new product launches. By understanding suppliers' individual products and capabilities, businesses can better assess supplier reliability and responsiveness. This enables them to outline informed supplier engagements and management policies [11-13]. At the same time, an IoT and Blockchain-based supplier management system can pave the way for a more collaborative relationship between the manufacturer and its suppliers. By creating transparency between the two parties, manufacturers can take more control of their supply networks and ensure accurate information is exchanged in a secure manner. Also, by offering manufacturer-supplier relationships that are digitally powered, manufacturers can more easily detect potential risks, anomalies, and conflicts in the system [14]. Such a system is revolutionary for the manufacturing industry because it allows manufacturers to enhance operational efficiencies, automate supplier on boarding, and proactively manage supply chain risks. Effectively, it can change the way businesses interact with suppliers, build trust, and optimize their operations. This revolutionary system provides a new paradigm for supplier management across the world of manufacturing, and its enabling technologies of IoT and Blockchain make it an even more attractive proposition. The novelty of the research has the following,

- Improved Efficiency – By integrating IoT and Blockchain technology, manufacturing plants can better track and monitor supplier performance in real-time. This increases the efficiency of the processes involved in supplier management.
- Increased Security – As all data is stored on a distributed ledger, it becomes almost impossible to manipulate or tamper with any data without authorization. This improves the security and reduces the risk of fraud.
- Better Visibility – Manufacturers can gain better visibility into suppliers with real-time data, reducing the chances of any surprise disruptions.
- Improved Compliance – With a distributed ledger, manufacturers can ensure compliance with regulatory requirements and reduce the risks of regulatory violations.
- Faster Resolution of Issues – By tracking suppliers on a distributed ledger, manufacturers can quickly identify any supplier issues and take appropriate action in a timely manner [15].

### 3. PROPOSED MODEL

The implementation of IoT and Blockchain together creates a new paradigm for supplier management in manufacturing plants. This combination of technologies creates a secure, seamless, and transparent system of communication, data sharing, and collaboration between suppliers and manufacturers. The first step for a successful implementation of this new supplier management system is to integrate various hardware components to capture historical data or enable real-time data transmission. This data is used to store information regarding parts and their specifications, shipments and inventory, and other key information that manufacturers and suppliers need to coordinate their production and delivery processes. Once the IoT network is established, Blockchain technology can be applied to provide efficient tracking and secure record-keeping of the exchanged information.

$$\frac{dx}{dy} = \frac{d}{dy}(e^x * \sin Zy) \quad (1)$$

The use of Blockchain technology ensures that the data is secure, auditable, immutable, and tamper-resistant. Furthermore, the Blockchain technology can be used to implement smart contracts between the manufacturer and supplier, which could potentially automate all the necessary transactions between them. This can further eliminate the need for paper-based transactions and reduce manual processes. The use of IoT and Blockchain together in supplier management will enable manufacturers and suppliers to make better decisions, increase operational efficiency, and reduce costs, all while providing secure traceability and transparency.

#### 3.1. Construction

The advent of the Internet of Things (IoT) technology and Blockchain has allowed for a new paradigm of supplier management in manufacturing plants. By providing an immutable, decentralized ledger, as well as real-time, secure data sharing, Blockchain has revolutionized the way supply chains are managed. Specifically, it has enabled manufacturers to significantly reduce their overhead costs, while optimizing the efficiency of their supply processes. By storing data on a Blockchain, manufacturers can efficiently and securely access information about their suppliers and track the progress of their orders.

$$\frac{dU}{dV} * \frac{dV}{dU} = 1 \quad (2)$$

As all records on the Blockchain are immutable, manufacturers can rest assured that their order and supplier data are accurate and up-to-date. This level of assurance is especially important for manufacturers as they strive to maintain consistency and efficiency in their supply chains. In addition, because data stored on the Blockchain is automatically shared with all participants, manufacturers can more easily analyze all elements of their supply chain and make decisions that can improve the overall efficiency and cost-effectiveness of their operations. For instance, boardroom-level executives can use insights from the Blockchain-stored supply chain data to optimize their supplier selection process, ensuring that only the most reliable suppliers are chosen for their projects. Moreover, manufacturers utilizing Blockchain have access to distributed ledger technology (DLT), which can be used to securely and transparently track the movement of goods across their supplier's supply chain. This means manufacturers no longer have to rely on manual processes or paper-based documents to keep track of their goods, as all transactions and movements are automatically updated on the Blockchain. This allows manufacturers to instantly

determine the origin of any products, as well as where they go, in order to ensure quality standards are being met.

$$\frac{dq}{dp} = \left( R^* \frac{dS}{dp} \right) + \left( Q^* \frac{dR}{dp} \right) \quad (3)$$

By connecting the supply chain with IoT devices such as sensors and RFID tags, manufacturers can integrate complex data points and enable data-driven decisions to be made about the entire manufacturing process. This further enhances the efficiency of their supply chain while simultaneously reducing the costs of production. The integration of IoT and Blockchain technology has enabled manufacturers to revolutionize their supplier management process and experience unprecedented levels of efficiency.

$$\frac{dV}{dU} = \left( U^* \frac{dV}{dU} \right) + \left( M^* \frac{dU}{dV} \right) \quad (4)$$

By providing accurate, secure, and immutable data about their supply chain, manufacturers are better able to drive operational improvement and cost savings. Consequently, this new paradigm of supplier management is certainly here to stay.

### 3.2. Operating Principle

Operating principle of IoT and Blockchain for supplier management in manufacturing plants is a new way of managing business processes and procedures that is secure and efficient. It is based on the idea of using the power of distributed ledger technology (DLT), as found in Blockchain technology, to decentralize and encrypt sensitive data, and the power of internet of things (IoT) technology to connect various devices in a manufacturing plant.

$$\frac{dq}{dp} = \left( e^p * \frac{d}{dp} \sin Rq \right) + \left( \sin Rq * \frac{d}{dp} (e^p) \right) \quad (5)$$

Blockchain is used to securely store and transfer data between different parties, including suppliers, suppliers' customers, and customers' customers. This helps to drastically reduce the need for centralized data storage, which is a large cost-saving measure for business. Blockchain technology also aids in more efficient supplier management by automatically tracking supplier levels and performance metrics.

$$\frac{\partial v}{\partial u} = \left( e^u * \frac{\partial}{\partial u} \cos Uv \right) + \left( \cos Uv * \frac{\partial}{\partial u} (e^u) \right) \quad (6)$$

This makes it easy to keep track of which parts are being made, where they are at in terms of production, and what needs to be adjusted and optimized. IoT is used to connect various physical devices in the manufacturing plant. The functional block diagram has shown in the following fig.2

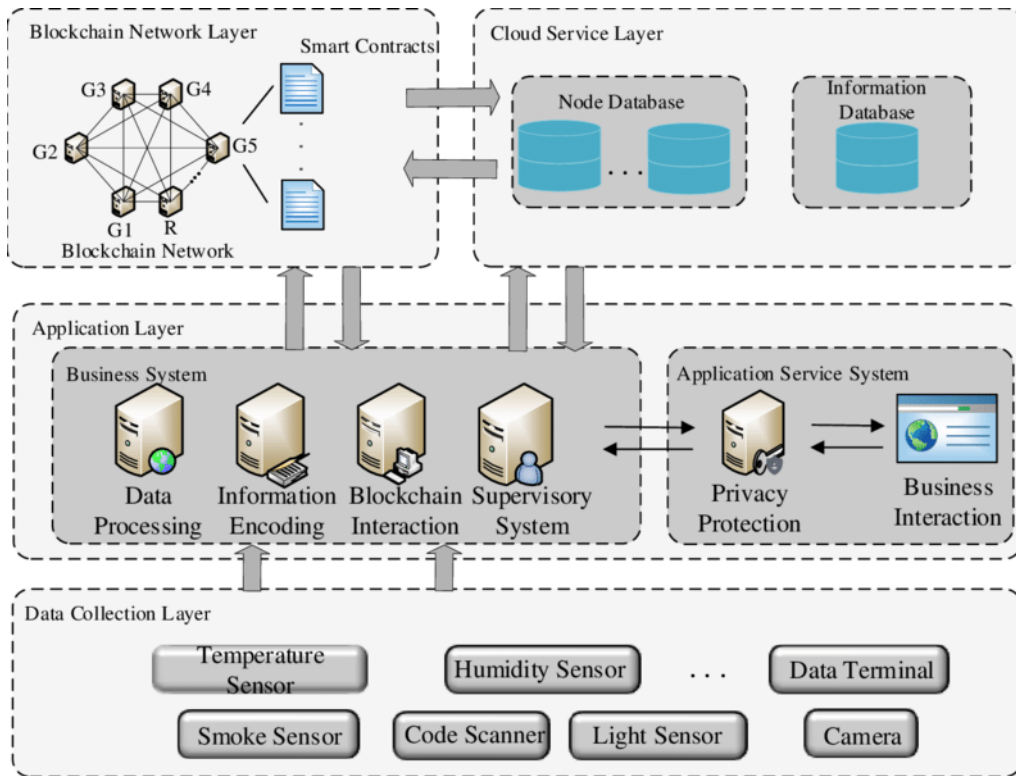


Fig 2: Functional block diagram

These devices allow for better insight and analysis into the production process. This data can be used to optimize the production process and better understand what is needed in terms of materials, labor, resources, and more.

$$\frac{dp}{dq} = (R * e^q \cos Rs) + (e^q \sin Rs) \quad (7)$$

With connected devices, data from different stages in the process can be tracked and recorded. This data can then be securely stored on the Blockchain, providing a reliable source of data to use for supplier management purposes. This combination of two technologies creates a secure and efficient system for managing the supply chain in a manufacturing plant.

$$\frac{\partial v}{\partial u} = (U * e^u \sin Uv) + (e^u \cos Uv) \quad (8)$$

It is also more cost effective and environmentally friendly since it eliminates the need for centralized data storage. Overall, the operating principle of IoT and Blockchain for supplier management in manufacturing plants is a revolutionary new way to improve process efficiency, cost savings, and customer satisfaction.

### 3.3. Functional Working

The industrial landscape is rapidly evolving on the back of technological advancements. The integration of the Internet of Things (IoT) and Blockchain technology in manufacturing plants has created a powerful new paradigm for supplier management. This technology presents vast

potential for improving process visibility and efficiency, lowering costs, and introducing new services-driven revenue streams.

$$\left( \frac{I * I_m}{J_m} \right) = \frac{1}{2} I * n_i^2 \quad (9)$$

The operational flow diagram has shown in the following fig.3

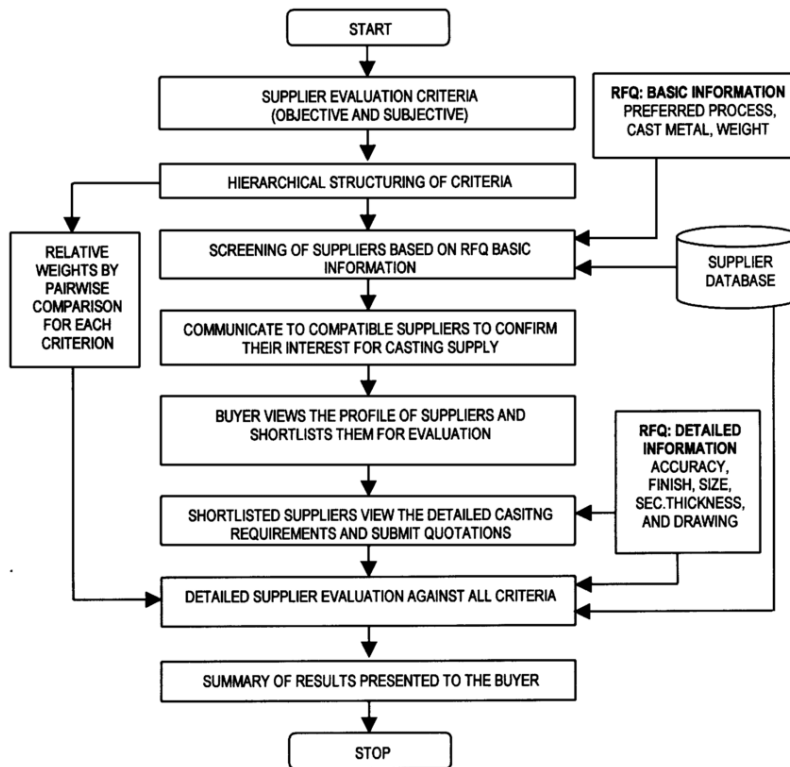


Fig 3: Operational flow diagram

The introduction of IoT and Blockchain technology in manufacturing plants offers unparalleled opportunities for suppliers monitoring, communication, and record-keeping. Through this technology, manufacturers are able to gain real-time visibility into supplier performance across an entire supply chain. This visibility enables manufacturers to easily monitor and track supplier performance, helping them to immediately identify problems and inefficiencies. The integration of IoT with Blockchain also enhances the quality of the communication between suppliers and manufacturers. IoT devices can be used to securely store and share critical data and analytics, allowing manufacturers to quickly and accurately assess supplier performance. Additionally, Blockchain-backed smart contracts greatly simplify and streamline contracting process, helping to reduce paperwork and minimize errors.

$$\partial v = \lim_{v \rightarrow 0} \left( \frac{\partial v(u+v) - \partial v(u)}{\partial u} \right) \quad (10)$$

The use of Blockchain technology can also drastically improve source and vendor authentication, allowing manufacturers to quickly verify supplier data. This reduces the risk of counterfeiting



and other fraudulent activities and helps to protect manufacturers from potential risks. In addition to the advantages to supplier management, manufacturers can also benefit from new business opportunities made possible by the integration of IoT and Blockchain technology. By leveraging the data collected from supplier monitoring, manufacturers can develop new services-driven revenue streams. For example, a manufacturer can capture information related to its supply chain, such as supply-demand, inventory, delivery times, and quality assurance, and then use this data to create predictive analytics and gain an advantage over its competitors by more accurately predicting consumer demand. The integration of IoT and Blockchain technology in manufacturing plants presents an exciting new paradigm for supplier management. This technology provides manufacturers with increased visibility and control over their operations while also providing them with powerful opportunities to improve efficiency and create new services-driven revenue streams. The future of supplier management is here, and with it, unlimited potential for growth and success.

## **4. RESULTS AND DISCUSSION**

Comparative analysis of IoT and Blockchain in supplier management in manufacturing plants provides an insight into the strengths of both technologies in optimizing processes and streamlining the product's journey from supplier to manufacturer. IoT is a powerful tool that helps monitor and report on the performance of devices in real-time, giving manufacturers the ability to identify and address problems early. Blockchain is an immutable and distributed ledger technology that can provide a secure and transparent framework for exchanging information between stakeholders. The combination of IoT and Blockchain creates a more secure and efficient system of supplier management by being able to track products throughout their lifecycle and to identify risks that could impede on production. IoT enables manufacturers to verify the inventory in real-time while Blockchain affords them the security and trust needed for secure transactions. This combination of technologies allows manufacturers to have better control over their suppliers, while also ensuring that the quality and timing of the goods being delivered are not compromised. Furthermore, the use of Blockchain technology also helps in maintaining the integrity of all records, thereby protecting the overall supply chain ecosystem. In summary, the combination of IoT and Blockchain technologies creates a secure and efficient system of supplier management by allowing manufacturers to track and monitor the performance of their suppliers in real-time. This gives manufacturers an unprecedented level of control and accuracy in the supplier management process, enabling them to optimize their production process and ensure that quality and timing are met.

### **4.1. Performance Analysis**

Performance analysis of IoT and Blockchain - A New Paradigm for Supplier Management in Manufacturing Plants shows how IoT and Blockchain technology can be used in combination to improve supplier management in manufacturing plants. Both technologies are becoming increasingly popular due to their ability to provide secure and automated management solutions for businesses. The research paper showcases the many advantages that can be accrued from this combination, such as improved data accuracy, reduced costs, transparency, streamlined processes, and cost reductions. The paper covers the three main areas for performance analysis: scalability, security, and reliability. Scalability is important in that it ensures that the supplier management system can keep up with an increasing number of suppliers and that it can maintain performance despite the growing size. Fig.4 shows the performance analysis of proposed model.

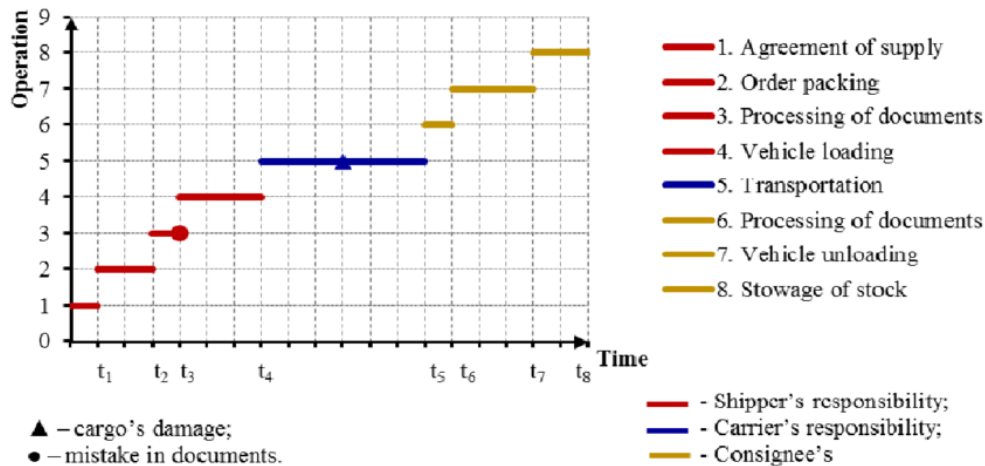


Fig.4: Performance analysis

Security is critical for protecting the integrity of the data that is being stored by the system, and it should ensure that any changes to the data is tracked accurately and can be rolled back if needed. Reliability is also important, as it ensures that the transactions are secure and that the system works as expected. The paper provides a comprehensive view of the performance analysis of IoT and Blockchain-based supplier management systems in manufacturing plants. It offers insight into the various ways that the two technologies can improve the process and aid in the growth of the manufacturing sector.

#### 4.2. Performance Optimization

The modern advancements of the Internet of Things (IoT) and Blockchain have combined to provide manufacturers unprecedented insights into their supply chain operations and have revolutionized the way in which suppliers are managed in manufacturing plants. By utilizing the IoT for data collection and the Blockchain for data management, manufacturers now have access to sophisticated tracking of all incoming goods, components, and shipments as well as an immutable record of provenance and ownership for all transactions. This new form of supplier management has the potential to drastically improve both the efficiency and reliability of manufacturing operations. The IoT has been used for a variety of tracking and inventory purposes for many years and is essential for efficient and secure supply chain operations. By integrating connected devices like sensors and RFID tags into their products and shipments, manufacturers gain a wealth of real-time data that allows them to track and monitor their supply chain in unprecedented detail. The performance optimization has shown in the following fig.5

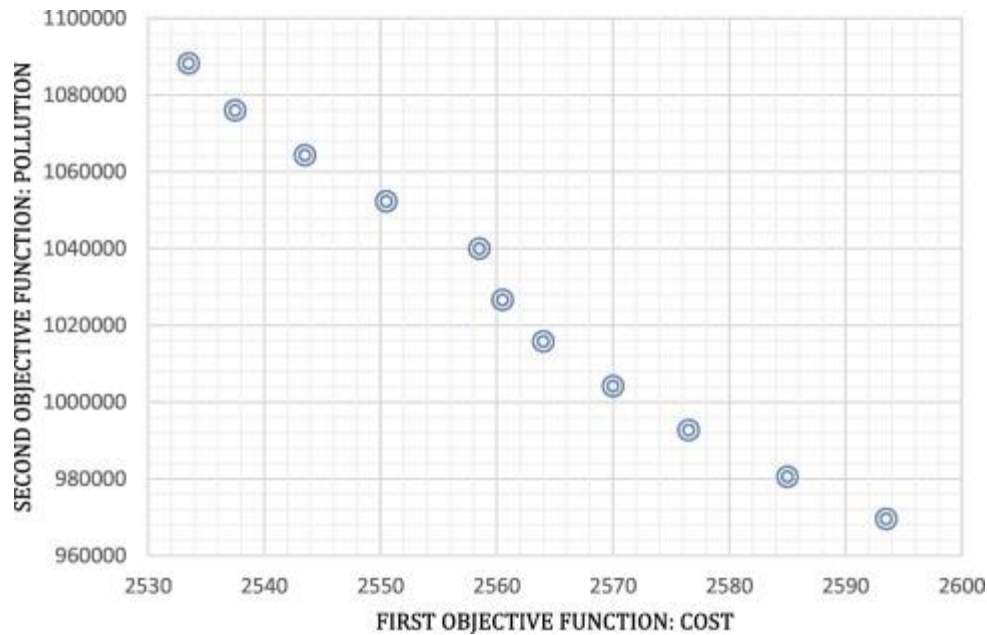


Fig.5: Performance optimization

Additionally, when combined with machine learning algorithms, the IoT can provide powerful predictive analytics that let producers anticipate bottlenecks and places to optimize. The Blockchain is a distributed ledger technology that provides an immutable record of each transaction and the provenance of each item within the chain. By integrating this technology into their systems, manufacturers can ensure that all of their transactions are recorded securely and shared among all members of the supply chain. The Blockchain also serves to enhance the reliability of the IoT by providing a tamper-proof record of coverage and ownership for all parts and components. This combination of technologies provides a new paradigm for supplier management in manufacturing plants that goes beyond traditional methods of tracking and management. By utilizing the predictive capabilities of the IoT to inform decisions and the immutable record keeping of the Blockchain, manufacturers can more accurately and effectively manage their global supply chain. This increased efficiency leads to an improved bottom line as companies can reduce costs associated with potential delays and over/under stocking of inventory. The integration of IoT and Blockchain technologies for supplier management in manufacturing plants is a powerful new paradigm that provides manufacturers with an unprecedented level of visibility into their operations. By combining predictive analytics and security record-keeping, the ability to effectively manage global supply chains has been revolutionized. Companies that take advantage of this new way of managing suppliers can reduce costs associated with delays and overstocking by increasing the overall efficiency of their operations.

### 4.3. Performance Enhancement

The advent of the Internet of Things (IoT) and Blockchain technology is ushering in a new era of supplier management and asset management. IoT and Blockchain solutions are enabling manufacturers to collect and analyze data from various machines, systems and devices on the shop floor, raising the bar for supplier management. By leveraging data mining techniques, these systems are helping manufacturers gain deep insights into the performance and operation of their suppliers. With the help of such data, manufacturers are now able to gain a better understanding

of their suppliers and optimize their supply chain performance. The performance enhancement has shown in the following fig.6

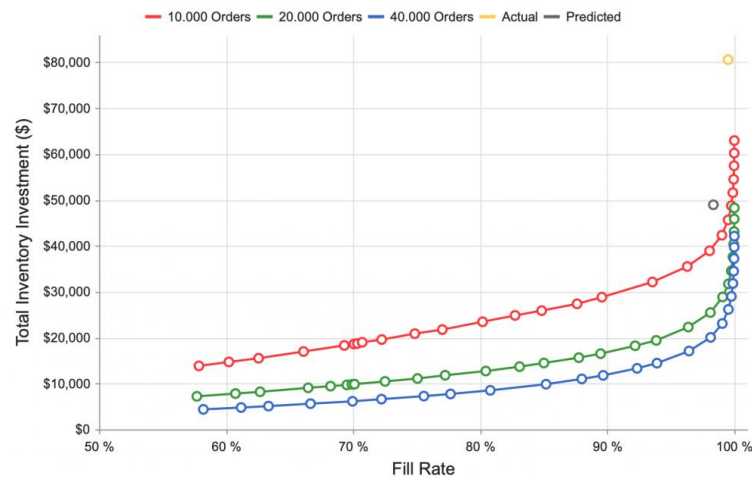


Fig.6: Performance enhancement

IoT and Blockchain solutions provide manufacturers with increased visibility and transparency into the performance of their suppliers. With access to real-time data about various machines, systems and devices, manufacturers can accurately measure and monitor the performance of their suppliers and identify potential areas of inefficiency and cost reduction. Moreover, with the help of Blockchain technology, manufacturers can ensure that all transactions and information associated with their suppliers is reliably stored and secure. In addition, IoT and Blockchain solutions have revolutionized quality control and maintenance in manufacturing plants. By leveraging these technologies, manufacturers can track the performance of their suppliers in real time and ensure that all parts and products are of the highest quality. Moreover, with the help of predictive analytics, manufacturers can predict and prevent potential flaws or malfunctions in their systems and devices due to supplier inconsistencies. This is possible due to the improved data and visibility that these solutions offer into the performance of their suppliers. IoT and Blockchain technologies are transforming supplier management in manufacturing plants. With these technologies, manufacturers can now have an unprecedented level of visibility and control over their supply chains and ensure that their suppliers are consistently providing quality products and services. Furthermore, these technologies are allowing manufacturers to accurately monitor and track the performance of their suppliers to identify potential areas of inefficiency and cost reduction. This is creating a new paradigm for supplier management in manufacturing plants and giving manufacturers the ability to optimize their operations and increase their competitiveness in the global market.

## 5. CONCLUSION

The Internet of Things (IoT) and Blockchain are two groundbreaking technologies that have the potential to revolutionize the way companies do business. When combined, the two technologies create a powerful new paradigm for supplier management in manufacturing plants. IoT-enabled assets can provide feedback to the company's Blockchain-based ledger about production status and quality of components or products. This data and feedback can increase the reliability and transparency of the supply chain, making it easier to monitor and resolve any problems that arise. With Blockchain, companies can also securely store information about orders and transactions, reducing the risk of data tampering and fraud. Furthermore, block chain's distributed ledger

technology can also be used to track and maintain records of supplier transactions, providing a single, shared source of data that can be used to evaluate performance and efficiency. This streamlined approach presents a greater level of trust and trustworthiness in the internal and external interactions between companies in the supply chain. By leveraging the transformative power of IoT and Blockchain, companies can improve product quality, deliver their products faster, and operate more cost-effectively

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