# SERVERLESS SUPPLY CHAIN OPTIMIZATION: ENHANCING EFFICIENCY AND REDUCING COST WITH AWS

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## ABSTRACT

*Supply chain management is at the heart of efficient business operations, and this project introduces a groundbreaking Serverless Supply Chain Optimization system powered by Amazon Web Services (AWS). Leveraging AWS services such as AWS EC2, Amazon API Gateway, this platform transforms traditional supply chains into agile, data-driven ecosystems. The project emphasizes real-time data processing, secure cloud storage, and predictive analytics, enabling businesses to streamline operations, enhance supply chain visibility, and minimize costs. By integrating serverless architecture, AI driven insights, secure data storage, and real-time monitoring, this Serverless Supply Chain Optimization system ensures businesses can achieve optimal efficiency, responsiveness, and cost effectiveness in their supply chain management.*

## KEYWORDS:

*Serverless Computing, Supply Chain Optimization, Amazon Web Services (AWS), Blockchain Traceability, Healthcare Supply Chain.*

## INTRODUCTION

Currently, Supply chain management has become a critical factor in ensuring efficiency, transparency, and cost-effectiveness for modern organizations, especially in healthcare where drug traceability directly impacts patient safety. Traditional supply chain systems often suffer from inefficiencies, lack of real-time visibility, and limited predictive capabilities, leading to higher costs and

risks. To overcome these challenges, this project introduces a Serverless Supply Chain Optimization system using Amazon Web Services (AWS), integrating services such as EC2, EBS, and API Gateway with blockchain technology. The serverless architecture enables real-time data processing, secure cloud storage, and AI-driven predictive analytics, while blockchain ensures tamper-proof records and transparency across stakeholders. By combining these technologies, the system enhances inventory tracking, demand forecasting, and route optimization, ultimately reducing operational expenses and fostering trust within the healthcare ecosystem. This innovative approach empowers organizations to streamline operations, safeguard patient health, and achieve sustainable efficiency in supply chain management.

## LITERATURE SURVEY

The first paper, *Patient's Medical History Summarizer using NLP* by D. Dharrao, focuses on summarizing patient records but does not extract specific content such as procedures and tests separately, which limits its practical utility. The second paper, *Adapted Large Language Models for Medical Clinical Text Summarization* by D. Van Veen (2023), applies advanced language models to clinical text but fails to provide highlighted or emphasized text in the generated summaries, reducing readability and clarity for medical professionals. The third paper, *Pre-trained Language Models with Domain Knowledge for Biomedical Extractive Summarization* by Q. Xie et al. (2023), leverages domain-specific knowledge for extractive summarization but is restricted to the types of medical reports it was trained on, meaning it cannot generalize effectively to different report formats. These limitations highlight the need for more robust approaches that combine domain knowledge, flexible summarization techniques, and enhanced readability features to improve medical report summarization systems.

## RELATED WORK

Modern technologies in supply chain optimization. Smith and Johnson (2022) showed how blockchain improves transparency and drug traceability in healthcare. Miller and Thompson (2021) demonstrated that serverless computing enhances scalability, cost-effectiveness, and real-time responsiveness in logistics. Brown and Wilson (2020) combined blockchain with machine learning to strengthen demand forecasting, inventory management, and route optimization.

Together, these works establish the foundation for integrating serverless, blockchain, and AI to build efficient and secure supply chain systems.
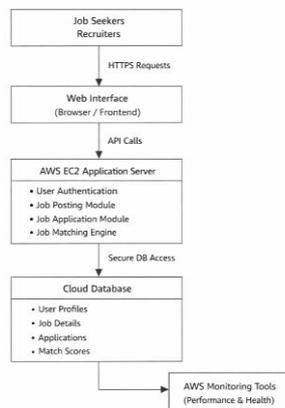
## SYSTEMARCHITECTURE:



**Fig 1: Block diagram**

This architecture represents a cloud-based job matching and recruitment platform deployed using AWS EC2. Job seekers and recruiters interact with the system through a web-based interface using secure HTTPS communication. The web interface forwards requests to the AWS EC2 application server for processing. The EC2 server manages user authentication, job postings, applications, and the job matching engine. All user and

job-related data are stored securely in a cloud database. The application server

accesses the database through secure connections to ensure data integrity. AWS monitoring tools continuously track system performance and health to maintain reliability.

## EXISTING SYSTEM

Supply chain systems are traditional and face several limitations in addressing modern industry needs. They often depend on manual data entry or delayed updates, which causes poor synchronization across different stages of the supply chain and results in inaccurate inventory levels, stockouts, and delays in order fulfillment. These systems also lack strong data security and struggle to process large volumes of information efficiently, leaving sensitive data vulnerable and limiting the generation of timely insights. Moreover, they do not provide advanced predictive analytics, making it difficult for organizations to forecast demand, optimize transportation routes, or evaluate supplier performance. Consequently, conventional supply chain platforms remain inefficient, costly, and unsuitable for critical sectors such as healthcare, where drug traceability, transparency, and patient safety are essential.

# PROPOSED SYSTEM

The proposed system is a Serverless Supply Chain Optimization framework using AWS services like EC2, EBS, and API Gateway for real-time data processing, secure storage, and seamless integration. It incorporates blockchain to ensure tamper-proof drug traceability and AI-driven predictive analytics for demand forecasting, inventory optimization, and route planning. With rich monitoring dashboards and alerts, the system enhances efficiency, reduces costs, and improves transparency and patient safety in healthcare supply chains.

## METHODOLOGY:

Data Cleaning: Remove duplicates, missing values, and inconsistent formats.

Normalization & Feature Extraction: Standardize values and extract key attributes (ID, batch, expiry, location).

Blockchain Encoding: Transactions stored as cryptographic hashes with smart contracts for verification.AI Analytics: Use predictive models for demand forecasting, inventory optimization, and route planning.

Serverless Processing: AWS services handle pipelines automatically with scalable integration.Visualization: Dashboards and alerts provide real-time monitoring.
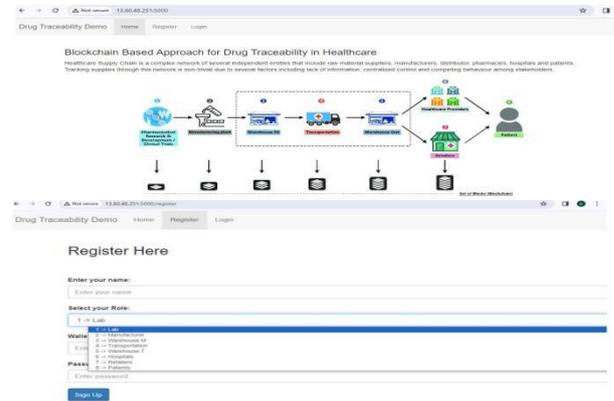
## RESULTS & SCREENSHOTS:



**Fig :2 Registration Page**



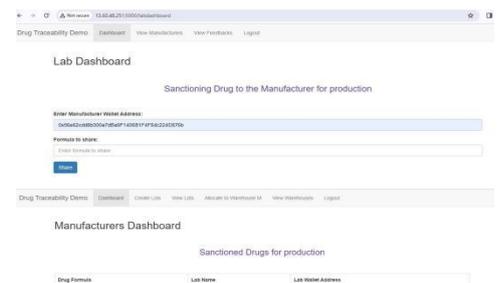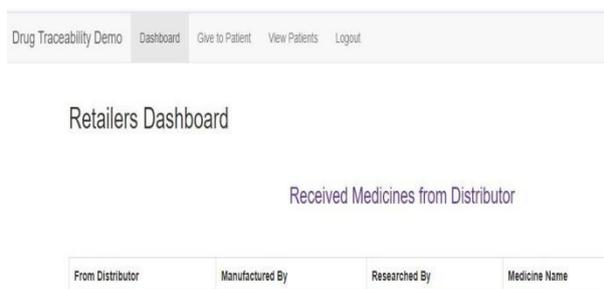**Fig 3: Login Page**



**Fig:4Manufacture Page**
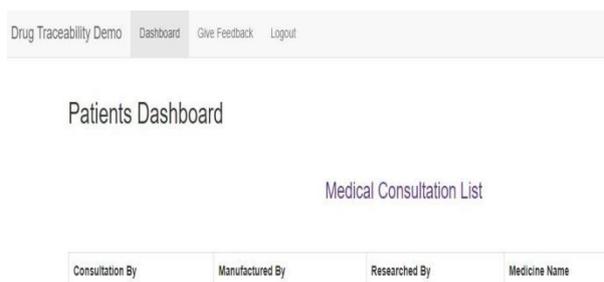
**Fig :5 Retailers Dashboard page**



**Fig:6PatientsDashboard
page**

## CONCLUSION

The Serverless Supply Chain Optimization system powered by Amazon Web Services (AWS) represents a groundbreaking leap forward in revolutionizing the drug traceability supply chain within the healthcare industry. Through the strategic utilization of AWS EC2 and Amazon API Gateway, this cutting-edge platform has been meticulously crafted to deliver real-time data processing capabilities, secure cloud storage solutions, and advanced predictive analytics functionalities.

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