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Supply ledger

Secure, Transparent, and Reliable Supply Chain Management System

## Inspiration

The inspiration behind SupplyLedger stemmed from the need to address the existing challenges in supply chain management. We recognized the lack of transparency and traceability in the supply chain, which led to consumer concerns regarding product quality, sustainability, and ethical practices. We were inspired to create a solution that would revolutionize supply chain management, bringing transparency, security, and reliability to the process. For example when we buy potato chips packet so we don't they were is came from? when it was created? from what type of potato it created? so for solving all these problem we have created this supplychain management system.

## What it does

SupplyLedger is a comprehensive supply chain management system specifically designed for the potato chips industry. It leverages blockchain technology to securely store and track the entire supply chain journey, from the farm where the potatoes are harvested to the factory where they are processed into chips. Customers can access this information through a user-friendly frontend and track the details of their chips packet, including farm location, quality standards, processing details, and logistics information. also it uses chainlink to call external apis to update the shipment status of logistics. User can see all details of chips packet and their potato from which it was preapared.

## How we built it

We built SupplyLedger using a combination of technologies. On the backend, we utilized Solidity, a programming language for writing smart contracts on the Ethereum blockchain, within the Hardhat development environment. This allowed us to create secure and immutable records of the supply chain data. For the frontend, we used ReactJS and Tailwind CSS to develop a visually appealing and user-friendly interface for customers to interact with the system. We also integrated Chainlink's real-time tracking solutions to provide accurate and up-to-date logistics information.

## Challenges we ran into

During the development process, we encountered several challenges. One of the key challenges was integrating external APIs for real-time logistics tracking. We had to ensure seamless integration and reliability of the data provided by these APIs. Additionally, ensuring the security and integrity of the blockchain infrastructure required careful attention to detail and thorough testing. Overcoming these challenges required a combination of technical expertise, problem-solving skills, and effective collaboration among team members.

## Accomplishments that we're proud of

In these smart contract we have created condition for maximum capacity and checking these batch of potato and chips is very important that that we proud the most. We are proud to have created a comprehensive supply chain management system that brings transparency and trust to the potato chips industry. Our accomplishment lies in successfully implementing blockchain technology to securely store and track the supply chain data. Furthermore, integrating Chainlink's real-time tracking solutions was a significant achievement, enhancing the accuracy and reliability of logistics information.

## What we learned

I have learned a lot about supply chain management. I have read about this and then implement it in smart contract. so by this way I learned many things about development and also about supplychain management. Throughout the development of SupplyLedger, we gained invaluable knowledge and experience. We deepened our understanding of blockchain technology and its applications in supply chain management. We learned about the complexities of integrating external APIs and ensuring data integrity. Collaboration and effective communication were vital in overcoming challenges and achieving our goals.

## What's next for SupplyLedger

Looking ahead, our vision for SupplyLedger is to expand its application beyond the potato chips industry. We aim to adapt and customize the system to cater to other product lines and industries. We will continue to enhance the user experience, incorporating user feedback and implementing new features to meet evolving market needs. Additionally, we plan to explore partnerships with stakeholders across the supply chain to further improve transparency and sustainability. Our journey with SupplyLedger is ongoing, and we are excited to drive the future of supply chain management toward a more transparent and customer-centric paradigm.There are a lot more features remained we can add them in these smart contracts

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Aim:---

* track a product’s authenticity
* trace the provenance
* Increased level of transparency with customers about where their products come from will offer reassurance that deepens their brand trust

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* participants already adhere to all necessary audit & certification requirements for their respective businesses, i.e. all physical movements are verified with the physical paperwork.
* utilize blockchain technology to deliver better transparency of sourcing, visibility into the supply chain, and peace of mind for the consumer that they are buying a piece of jewelry that has had all its component parts and raw materials fully authenticated and responsibly created.
* tracks the jewelry supply chain from the mines of origin of the diamond and precious metals, through to the refining, polishing, jewelry manufacturing and shipping the final product to the retail store.
* will provide the consumer with a permanent digital record of all the transactions in the diamond and jewelry value chain.

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* Traceability: The smart contract should be able to track the movement of goods through the supply chain. This can be done by storing the product name, current location, and previous location of each product.
* Quality control: The smart contract should be able to ensure that goods meet certain quality standards. This can be done by storing the quality of each product and by requiring that the quality of a product does not fall below a certain threshold.
* Payments: The smart contract should be able to automate payments between different parties in the supply chain. This can be done by storing the amount due to each party and by automatically transferring funds when a product is delivered.
* Reputation: The smart contract should be able to track the reputation of different parties in the supply chain. This can be done by storing the number of times a party has delivered good quality products on time and by automatically updating the reputation of a party when they deliver a product.

Resources:---

<https://www.ibm.com/blogs/think/2018/04/global-jewelry-ibm-blockchain/>

<https://www.provenance.org/whitepaper>

<https://www.skuchain.com/>

<https://www.youtube.com/watch?v=mzPoUjQC4WU&list=PLHRLZtgrF2jl8yqucJsMFqh5XpRLTgCI4>

<https://www.youtube.com/watch?v=6ImFBrRuGG0>

<https://docs.google.com/document/d/155xbx8YC8WnAEz_0yh47BtZu79KG6LVpiBN_4z4zvCE/edit>

Inspiration