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Blockchain-Driven Environmental Sustainability and Trust Ecosystem

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OUTLINE

- 1 AREA OF SELECTION
- 2 ABSTRACT
- 3 INTRODUCTION
- 4 PROBLEM DEFINITION
- 5 SCOPE OF THE SYSTEM
- 6 OBJECTIVE
- 7 REQUIREMENT SPECIFICATION
- 8 PROPOSED SYSTEM
- 9 FEASIBILITY STUDY
- 10 ARCHITECTURE DIAGRAM
- 11 USECASE DIAGRAM
- 12 DATAFLOW DIAGRAM
- 13 ER DIAGRAM
- 14 METHODS AND TECHNIQUES
- 15 PROGRESS IN PROJECT
- 16 EXPECTED OUTCOMES
- 17 CONCLUSION
- 18 REFERENCE

Block Chain

A blockchain is a distributed ledger with growing lists of records (blocks) that are securely linked together via cryptographic hashes. Each block contains a cryptographic hash of the previous block, a timestamp, and transaction data.

ABSTRACT

- Protects environmental monitoring data with blockchain technology.
- Offers a cryptocurrency (EcoTokens) as rewards for eco-friendly actions.
- Utilizes decentralized blockchain for data storage and sharing.
- Automates EcoToken rewards with smart contracts.
- Encourages sustainable practices and environmental consciousness.

INTRODUCTION

- In a rapidly evolving world marked by social and economic progress, environmental concerns have taken center stage.
- Conventional environmental monitoring systems are hampered by data fragmentation and susceptibility to tampering.
- To combat these challenges, this project introduces a pioneering Environmental Monitoring Data Security Model.
- This model is complemented by an innovative EcoToken Cryptocurrency, creating a synergy that ensures data integrity and incentivizes eco-friendly practices.
- Together, these elements form a powerful and holistic response to today's pressing environmental issues.

PROBLEM DEFINITION

- Conventional environmental monitoring systems suffer from data silos and vulnerability to data falsification.
- The lack of secure data storage and integrity verification hinders effective environmental management.
- This project aims to address these issues by proposing a secure data model and an eco-token incentive system for sustainable actions.

SCOPE OF THE SYSTEM

It encompasses the secure storage, sharing, and verification of environmental monitoring data through blockchain technology, coupled with an EcoToken ecosystem to incentivize and reward sustainable activities and product choices.

OBJECTIVE

- Enhance the security and integrity of environmental monitoring data.
- Promote sustainable behavior and choices through an EcoToken incentive system.
- Create a comprehensive solution that combines data security and ecological awareness to address environmental challenges effectively.

COMPARISON TABLE

Paper 1: Research on Data Security Model of Environmental Monitoring Based on Blockchain.	Paper 2: A Proposed Model for Improving the Reliability of Online Exam Results Using Blockchain.	Paper 3: A Cyber Secure Medical Management System by Using Blockchain.	Paper 4: A Copyright-Preserving and Fair Image Trading Scheme Based on Blockchain.
Enhances environmental data security and transparency through a blockchain-based model.	Improves online exam security by implementing a blockchain-based, tamper-proof system within Learning Management Systems (LMS).	TISVChain uses blockchain to secure pharmaceutical supply chains, combat counterfeits, and ensure vaccine authenticity with high TPS and low costs.	Our scheme secures image copyrights and enhances fairness in image trading with digital technologies and smart contracts.
Advantages: Ensures data integrity through immutability.	Advantages: Enhanced Security and Integrity	Advantages: Privacy Control	Advantages: Confidential search queries and access controls protect user privacy
Provides strong data security with encryption	Efficient Verification and Authentication	Enhanced Security	Mechanisms ensure fairness for both data owners and users
Disadvantage: Scalability issues can slow down transactions.	Disadvantage: Scalability Issues	Disadvantage: Complexity issues	Disadvantage: Reliance on blockchain can introduce latency and costs.

Functional requirements

- 1 Security
- 2 Integration
- 3 Storage capability

Hardware interfaces: There are no external hardware interface requirements for this system. System Hardware requirements:

- 1 CPU: 2+ Cores, 2.46+ Ghz
- 2 RAM: 6 GB or higher
- 3 Disk: 25 GB + free space

PROPOSED SYSTEM

The proposed system is an integrated online platform designed to promote environmental sustainability and responsible business practices among registered companies. This system allows companies to register and securely record their environmental data, specifically emissions of substances harmful to the environment, onto a blockchain ledger, ensuring data integrity and transparency.

- Technical Feasibility

The main technologies and tools that are associated with this project are: blockchain, python, HTML, Django etc. Most of these are open source and freely available and the technical skills required are manageable as there are well described docs available. Hence this project is technically feasible.

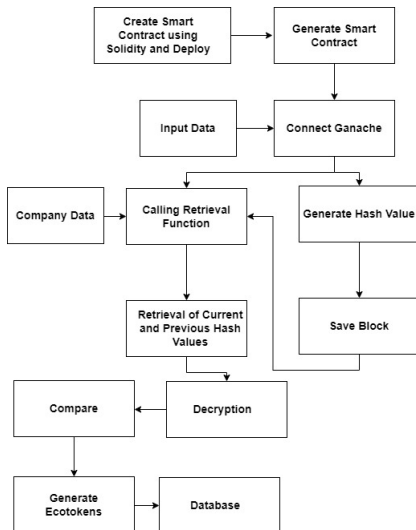
- Economical Feasibility

Since the project uses open source tools, the cost for development can be eliminated. Hence this project is economically feasible.

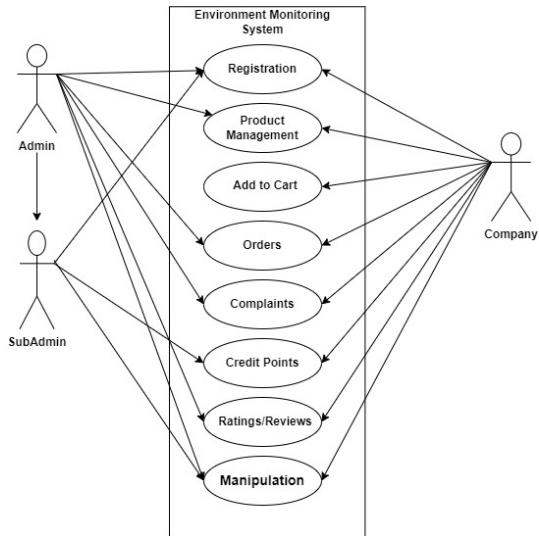
- Operational Feasibility

Since there's no operational cost, the project is operationally feasible.

ARCHITECTURE DIAGRAM

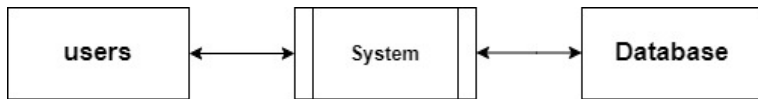


USECASE DIAGRAM



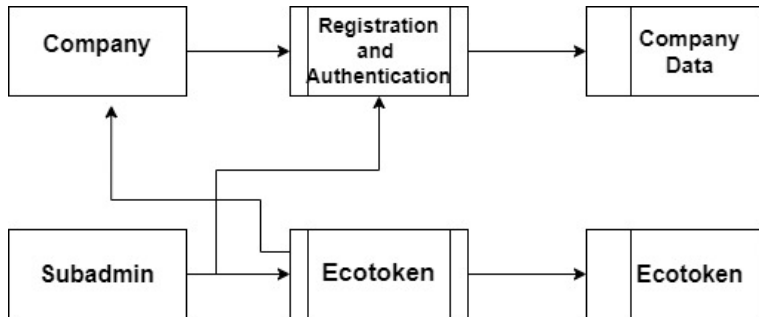
DATAFLOW DIAGRAM

- DFD Level 0



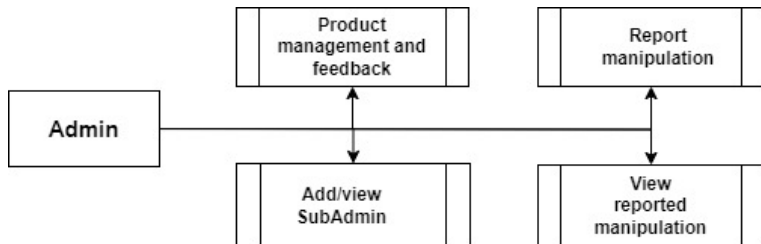
DATAFLOW DIAGRAM

- DFD Level 1



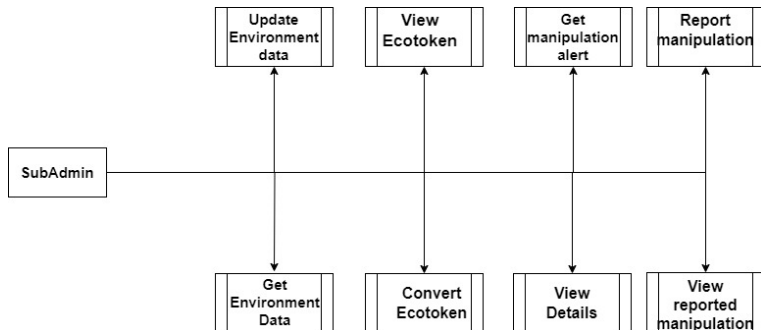
DATAFLOW DIAGRAM

- DFD Level 2.1



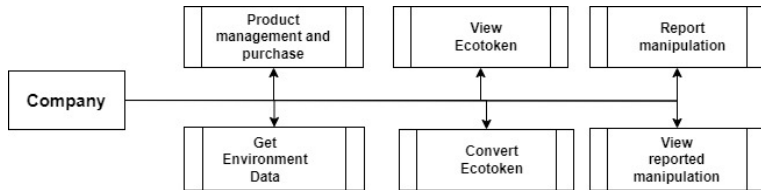
DATAFLOW DIAGRAM

- DFD Level 2.2

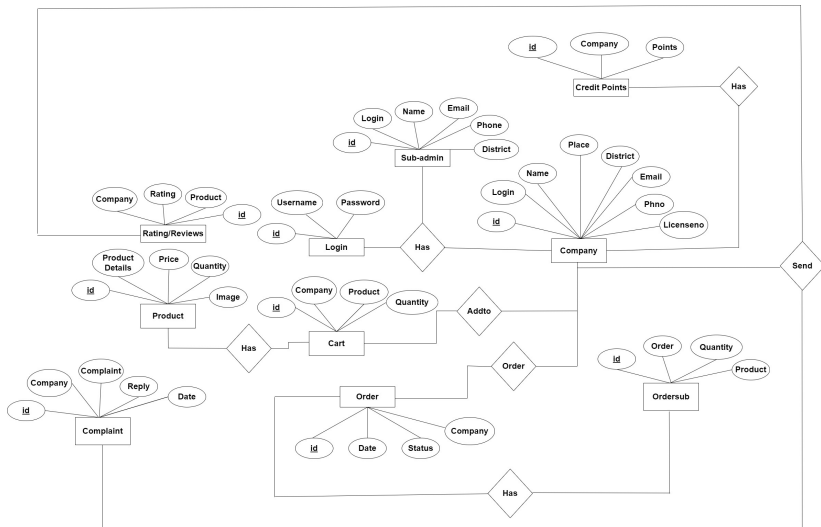


DATAFLOW DIAGRAM

- DFD Level 2.3



ER DIAGRAM



The methods and techniques used are:

- Ethereum
- Solidity
- Truffle
- Web3
- Smart contract

PROGRESS IN PROJECT

- Breaking the project into admin, sub-admin, and company modules facilitates modular development, simplifying the coding process and enhancing manageability.
- Specialization is streamlined as developers can focus on specific modules, optimizing expertise and improving overall quality.
- Integration of independently developed modules is seamless, ensuring a step-by-step and error-resistant approach to forming the complete system.

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Environment

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**Earth provides enough
to satisfy every man's
needs, but not every
man's greed.**





- Login

Welcome to environ

Complete solution

The environment is where we all meet; where we all have a mutual interest; it is the one thing all of us share

Username	<input type="text"/>
Password	<input type="password"/>
<input type="button" value="Login"/>	
Don't have an account signup Now?	

• Admin Interface


123 Street, New YorkEmail@example.com

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Environment

HomeSubadminProductsCompanyOrdersComplaintChange passwordManipulation

Earth provides enough
to satisfy every man's
needs, but not every
man's greed.



• SubAdmin Interface


123 Street, New YorkEmail@Example.com

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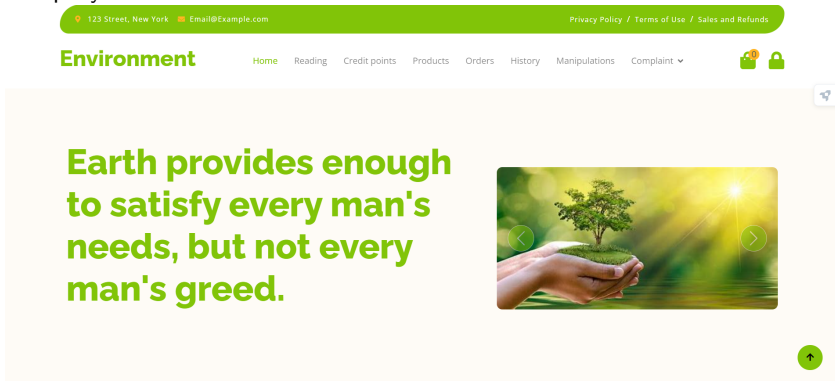
Environment

HomeVerify CompanyVerified CompanyNew Manipulation ListManipulation List

Earth provides enough
to satisfy every man's
needs, but not every
man's greed.



- Company Interface



PROGRESS IN PROJECT

Blockchain Interface

The screenshot displays the Ganache desktop application. The top navigation bar includes icons for ACCOUNTS, BLOCKS, TRANSACTIONS, CONTRACTS, EVENTS, and LOGS. A search bar on the right allows for searching by block numbers or transaction hashes. Below the navigation bar, a status bar shows current block 3, gas price 2000000000, gas limit 6721975, hardfork merge, network id 5777, RPC server URL, and mining status (AUTOMINING). The main content area shows the MNEMONIC (people candy museum snow pilot voyage verify alert between uniform misery about) and the HD PATH (m44'60'0'0account_index). Below this, a table lists accounts with their addresses, balances (100.00 ETH), transaction counts, and indices. Each account entry includes a copy icon.

ADDRESS	BALANCE	TX COUNT	INDEX
0x479311A03f630bECbe5D7297338bCE02d6b64415	100.00 ETH	3	0
0x831095809A564D77b436cA415F4663D1c620a559	100.00 ETH	0	1
0x1694B95bAf6739a8F66b374c5C36965142159bd3	100.00 ETH	0	2
0x4Cc206dAbA1145129d79852B8aaEBeeAd112e884	100.00 ETH	0	3
0x2C783Eaba9e6828f72fdE94A503695Cd21556f84	100.00 ETH	0	4
0x7a6B96A401801Af98253c650BAB5E92A98c9be9B	100.00 ETH	0	5
0x7F5B88C35b70216EbE81Bbc8750bBa58a0AA6DF2	100.00 ETH	0	6

EXPECTED OUTCOMES

- Blockchain's immutability guarantees the tamper-proof status of environmental data, preserving its integrity.
- Evaluating security features like encryption and consensus mechanisms is essential to gauge blockchain's effectiveness in safeguarding sensitive environmental information.
- The outcome highlights how blockchain's robust security measures maintain the accuracy and reliability of monitoring data.

CONCLUSION

- Our platform promotes environmental sustainability and responsible business practices.
- Blockchain technology ensures secure and transparent data storage.
- EcoTokens incentivize eco-friendly behavior and product adoption.
- Future innovations include advanced data analytics and IoT integration.
- The project's scope extends to global adoption, regulatory compliance, and environmental education.

REFERENCE

- [1] bdelsalam, Mohamed, Amira M. Idrees, and Marwan Shokry. "A Proposed Model for Improving the Reliability of Online Exam Results Using Blockchain." IEEE Access (2023).
- [2] u, Feng, et al. "A Copyright-Preserving and Fair Image Trading Scheme Based on Blockchain." Tsinghua Science and Technology 28.5 (2023): 849-861.
- [3] ehman, Muhammad, et al. "A cyber secure medical management system by using blockchain." IEEE Transactions on Computational Social Systems (2022).