Diamond Zone Project

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What is the problem you are trying to solve?

The Diamond Exchange Center relies on physical "delivery notes" for memo purposes before finalizing purchases. This process is inefficient, prone to errors, and hard to monitor.

Borrowing diamonds between individuals is a common activity that can occur multiple times throughout the workday, often involving interactions with numerous clients and sometimes even while on the move. It involves manual documentation and physical handling, making it challenging to manage inventory, track transactions, and ensure clear communication between merchants. Additionally, the lack of a digital system creates potential disputes and limits scalability.

How do you intend to approach the problem?

We propose a digital platform for diamond trading that leverages blockchain technology and smart contracts to streamline the borrowing, selling, and inventory management process.

Each diamond merchant will have a user account with an inventory management system where they can list their diamonds and manage transactions. Borrowing requests will be initiated and approved digitally. Instead of relying on a physical "delivery note," which is prone to human error, loss, and lack of traceability. Diamond merchants will have the ability to utilize digital smart contracts for borrowing and transactions agreements. These smart contracts provide an immutable, automated, and secure way to manage the terms and conditions of the transaction.

In the Diamond Zone project, Blockchain plays a central role in ensuring transparency, security, and efficiency in diamond trading. By leveraging Ethereum's robust ecosystem, the platform utilizes smart contracts to automate agreements between merchants, ensuring immutable and tamper-proof transactions. Blockchain's decentralized nature eliminates reliance on a single point of control, reducing risks such as fraud and disputes. Additionally, every action recorded on the Blockchain is easily traceable, fostering trust among merchants and creating a reliable audit trail. This integration of Blockchain not only modernizes traditional diamond trading practices but also establishes a foundation for sustainable growth and innovation in the industry.

Who are the expected users of the application?

The platform is designed to serve all those involved in the diamond trade, providing a unified, digital solution for managing inventory and facilitating transactions.

Diamond merchants and companies will use the platform to manage their diamond inventory, initiate borrowing requests or respond to borrowing requests from other merchants, and track the status of transactions.

What will be the main features and flows of the users?

Features:

1. **User Registration**:

   Profile for each diamond merchant, including:
   - ◊ Company name
   - ◊ License number
   - ◊ Additional identification details (e.g., digital wallet address)

   Identity verification through a KYC (Know Your Customer) mechanism before joining the system.

2. **Diamond Inventory Management**:

   The **Diamond Zone** platform offers a comprehensive inventory management system tailored specifically to the needs of diamond merchants. Key functionalities include:

- ♦ Merchants can seamlessly add diamonds to their inventory by providing detailed attributes for each diamond, such as:
  - ◊ Weight (carats), shape, color, clarity, cut, polish, Symmetry, UV
  - ◊ Certification details
  - ◊ Cost, Supplier, Buying date, expenses
- ♦ Merchants can modify the details of diamonds already in their inventory to reflect changes such as updated certification, re-evaluations, or ownership transfers.
- ♦ A dedicated analytics dashboard provides merchants with insights into their inventory, including:
  - ◊ Total purchases this month
  - ◊ Total sales this month
  - ◊ Cash flow summary (including income and future payments)

3. **Borrowing Requests**:

- Merchants can browse the inventory of other merchants and initiate borrowing requests for specific diamonds directly through the platform. Each request includes the diamond's details, the proposed borrowing period, and any additional terms or notes.
- Lending merchants are notified of new borrowing requests and can review the terms, including proposed duration and conditions. They can choose to approve, deny, or negotiate the terms of the request.
- Once a request is approved, the system automatically updates the status of the diamond in the inventory to "Borrowed," and a smart contract is generated to formalize the agreement.
- Both parties can track the status of the borrowing agreement, with reminders for key actions, such as returning the diamond or extending the borrowing period.

4. **Smart Contracts**:

Smart contracts are a core component of the Diamond Zone platform, ensuring secure, automated, and transparent transactions between merchants. Key functionalities include:

- Upon mutual approval of a borrowing or selling request, the platform automatically generates a smart contract.
- Tracking of the diamond’s status: Borrowed, Returned, or Sold.
- Smart contracts automate the enforcement of terms.

By leveraging smart contracts, the Diamond Zone platform significantly reduces reliance on manual processes, increases efficiency, and ensures that all transactions are conducted in a secure and trustworthy manner.

5. **Documentation and Monitoring:**

- All actions and transactions on the platform are securely recorded on the Blockchain, ensuring they cannot be tampered with or altered. This creates a trustworthy and transparent record of all activities.
- Merchants can search and display past transactions.
- The system provides merchants with tools to monitor active agreements, track pending actions, and receive updates or reminders for deadlines, such as payment or return dates.
- Blockchain-based documentation ensures full traceability, making it easier for merchants to track their inventory.

User Flows:

1. Merchant A selects a diamond from Merchant B's inventory and clicks "Request Borrowing."

2. Merchant B receives the request and approves it.

3. Both merchants digitally sign the borrowing agreement, which is recorded as a smart contract on the blockchain.

4. If the diamond is purchased, the contract is marked as "Sold." If returned, both parties confirm, and the diamond is marked as "Returned."

Are there any external dependencies?

1. **Blockchain Network**:

   - Ethereum for deploying smart contracts and recording transactions.

2. **Hosting and Backend Services:**

   - Cloud services for hosting the web application and storing inventory data.

3. **Smart Contract Development:**

   - Using Solidity for writing and deploying smart contracts.

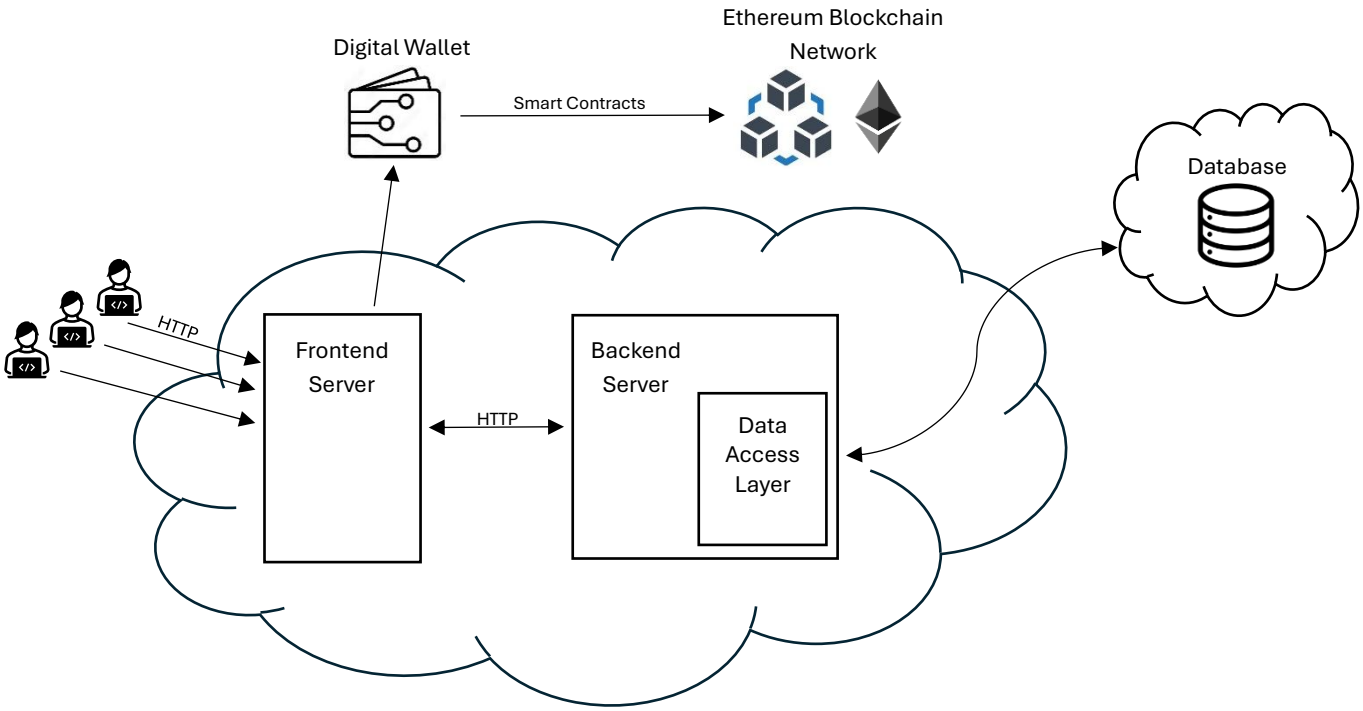
4. **Payment Integration (optional):**

   - Integration with cryptocurrency payment systems to generate invoices for each transaction.

Market Review and Comparison

Several blockchain-based platforms have been developed in the diamond industry to enhance transparency and trust.
Tracr by De Beers provides full traceability of diamonds from mine to retail, but it is mostly limited to De Beers' ecosystem.
Everledger focuses on registering and authenticating luxury assets such as diamonds, gemstones, and fine art using blockchain and NFTs, yet it emphasizes provenance and insurance rather than everyday trade operations.
Diamante Blockchain offers a B2B platform for digital payments and smart contracts, but its adoption is still limited, and it focuses primarily on transactions rather than inventory workflows.
In contrast, our solution addresses the daily operational needs of merchants by combining **inventory management, borrow/return processes, and smart contract–based trade approvals** into one accessible system. This approach not only ensures transparency and security but also digitizes the traditional "delivery note" workflow, offering a unique advantage over existing solutions.

Central Architecture



Blockchain Technologies Overview

Blockchain

The variety of technologies in the Blockchain field is growing daily. Along with the expansion of major networks such as Bitcoin, Ethereum, Cardano, and BSC, new networks emerge to address familiar challenges in the older networks.

Blockchain's decentralized nature ensures that no single entity has full control over the data, making it highly secure against tampering and cyberattacks. Transactions recorded on the Blockchain are immutable and transparent, enabling participants to verify information independently without relying on intermediaries. This makes Blockchain particularly suited for industries where trust, transparency, and accountability are crucial, such as finance, supply chain management, and, of course, diamond trading.

Ethereum

Ethereum is a Blockchain network first introduced in 2013 by its founder, Russian-Canadian software engineer Vitalik Buterin. Ethereum is an open-source platform based on Blockchain technology, enabling the creation of smart contracts and the use of non-fungible tokens (NFTs) to execute transactions and agreements on the network without relying on a central entity, such as banks, to complete the transaction.

Advantages:

- **Decentralization**: Ethereum is a decentralized network that enhances user privacy, with information not centralized on a single server.
- **Large Developer Community**: Ethereum is an open-source project with the largest developer community in the world, continuously improving the network. It has advanced documentation and monitoring, along with proven support and experience, surpassing alternatives supporting smart contracts.
- **Smart Contracts**: These are executed automatically once both parties agree on predefined terms.

Disadvantages:

- High operational costs for transaction processing.
- Long waiting times ranging from 15 seconds to 5 minutes.

Solidity

Solidity is a high-level, object-oriented programming language that enables developers to implement various types of smart contracts. Solidity was developed by the Ethereum core development team and was significantly influenced in its early days by languages like Python, JavaScript, and C++. Similar to some of these languages, Solidity has its own virtual machine, the Ethereum Virtual Machine (EVM), which allows the execution of the Solidity compiler.

Advantages:

- **Scripting Language**: Relatively easy to learn.
- **Inheritance**: Solidity supports inheritance between different types of contracts, providing flexibility and enabling more readable and maintainable code.
- **High Security**: Thanks to built-in security functions in the language.

Disadvantages:

- A relatively new language.
- Like JavaScript, the language does not support multithreading.

Smart Contracts

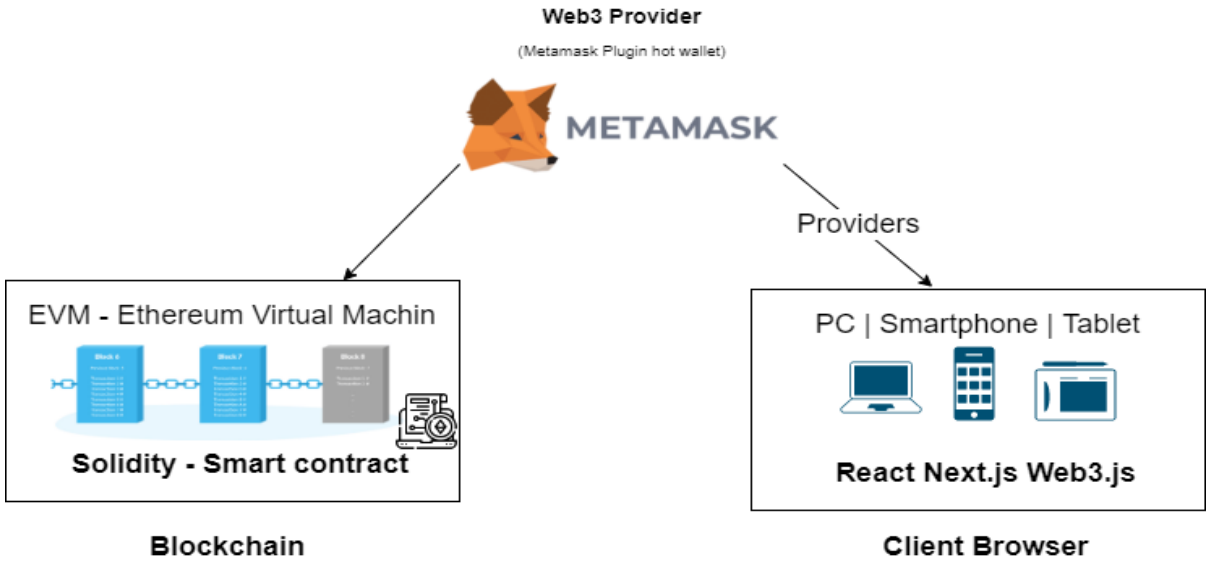
A smart contract is a digital agreement—a piece of code that specifies a business operation automatically executed when predefined conditions are met. It is stored on a Blockchain network. A smart contract is public, immutable after publication, and executed only after the predefined conditions (e.g., both parties approving the transaction) are verified by the Blockchain network.

The advantage of using smart contracts is that both parties in the transaction are protected against transaction denial or payment network failures. It also eliminates the dependence of either party on banks, as smart contracts enable the exchange of digital assets for compensation—in this case, enabling secure and automated execution of diamond transactions.

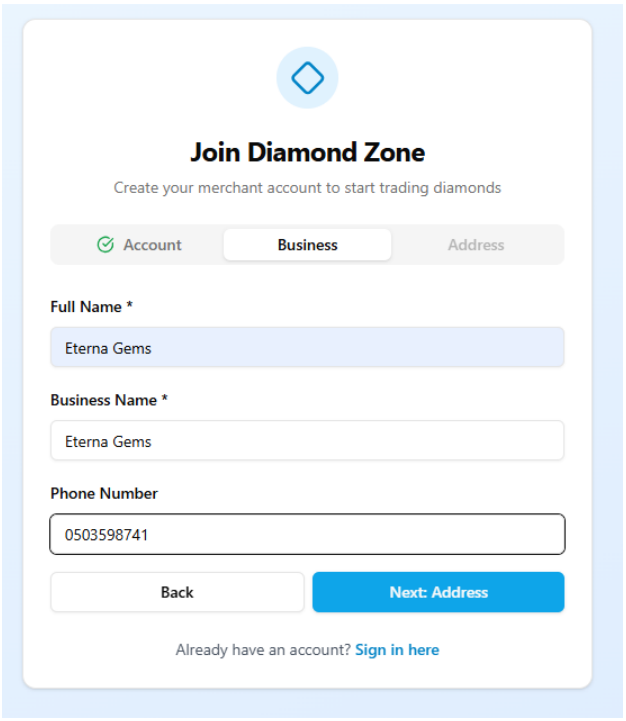
The smart contract is stored on the Ethereum network called Rinkeby, which allows the storage of various types of smart contracts without cost.

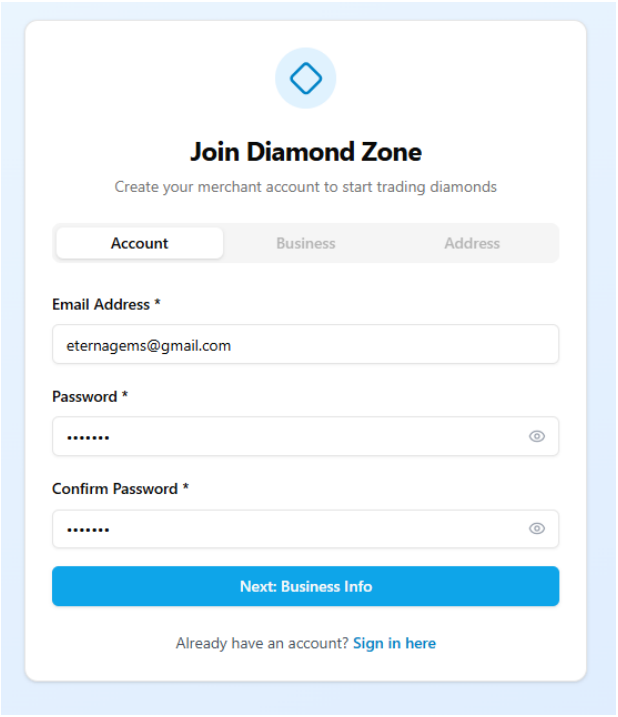
Working with Smart Contracts

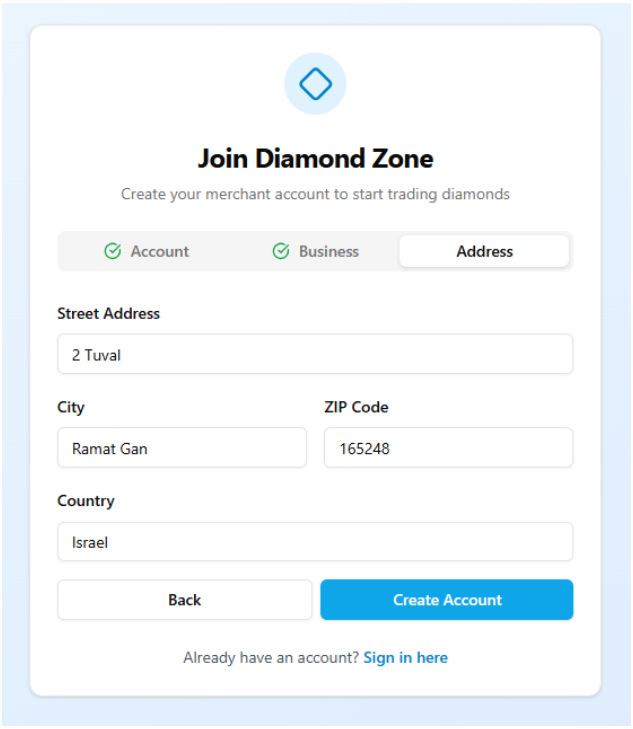
To perform operations in the system, both sellers and buyers must use a "hot wallet"—a digital wallet that allows storing various digital assets and cryptocurrencies. This wallet is accessible from anywhere via the internet and through the wallet extension, MetaMask. The hot wallet acts as an interface between the user interface and the Blockchain world, allowing users to sign and approve transactions.



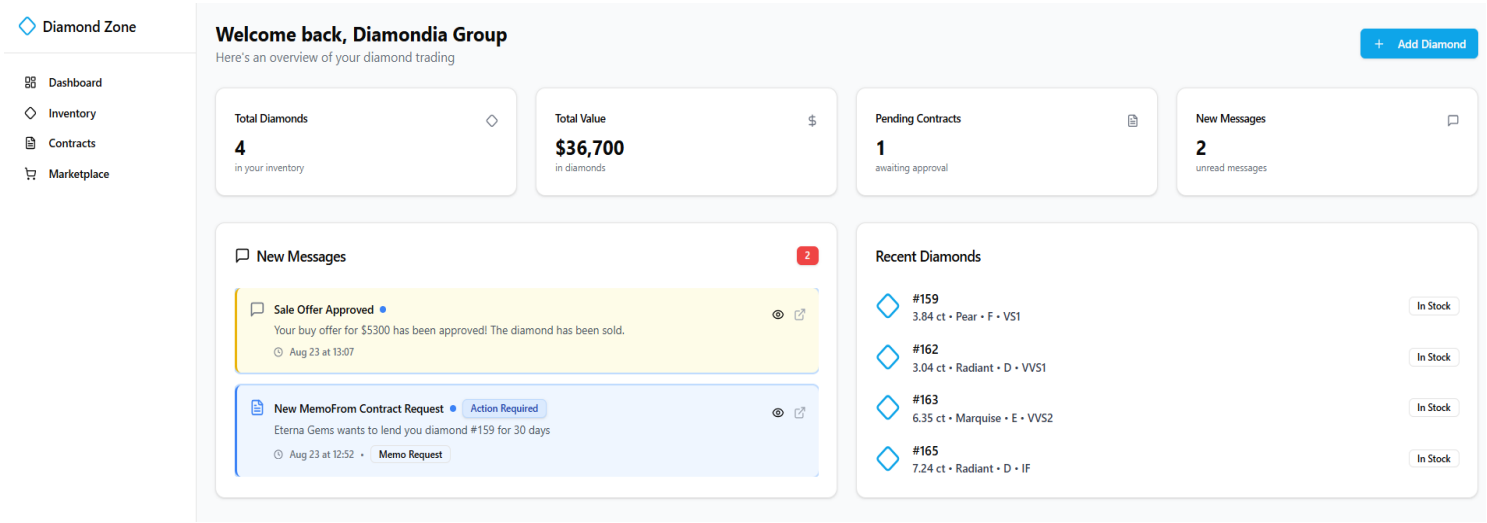
Create Account



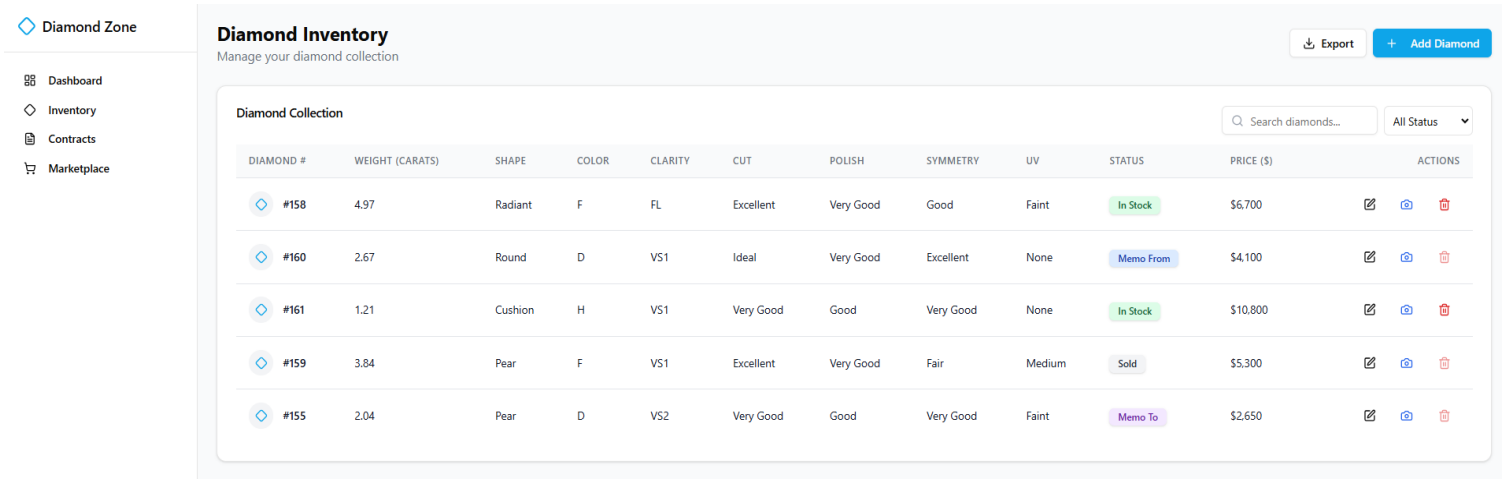




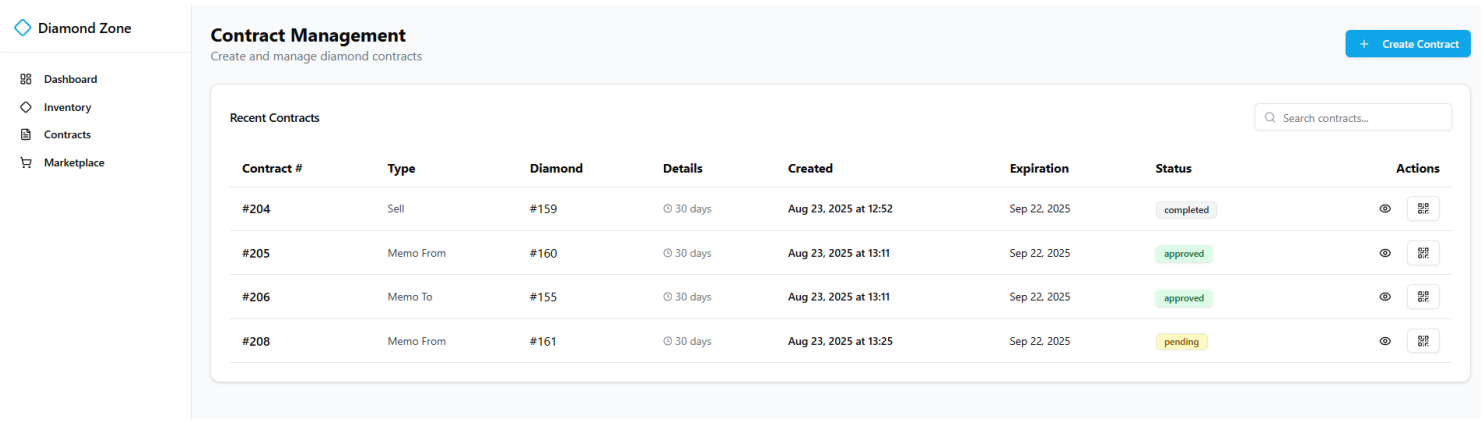
Dashboard

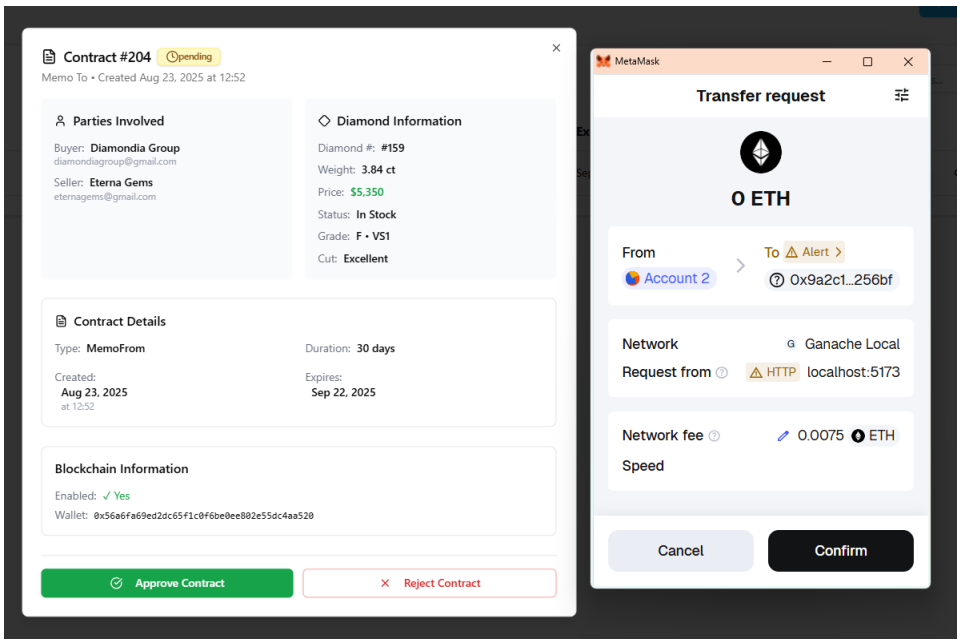


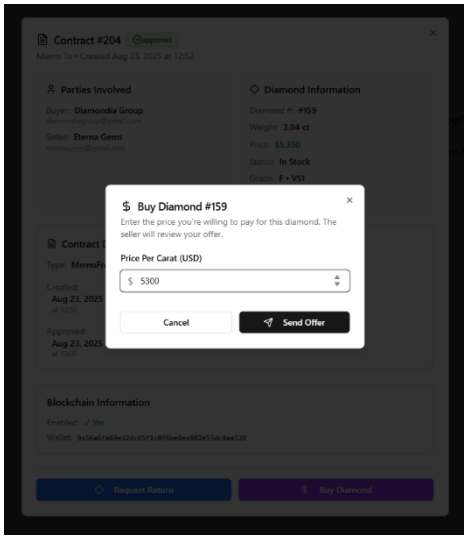
Inventory

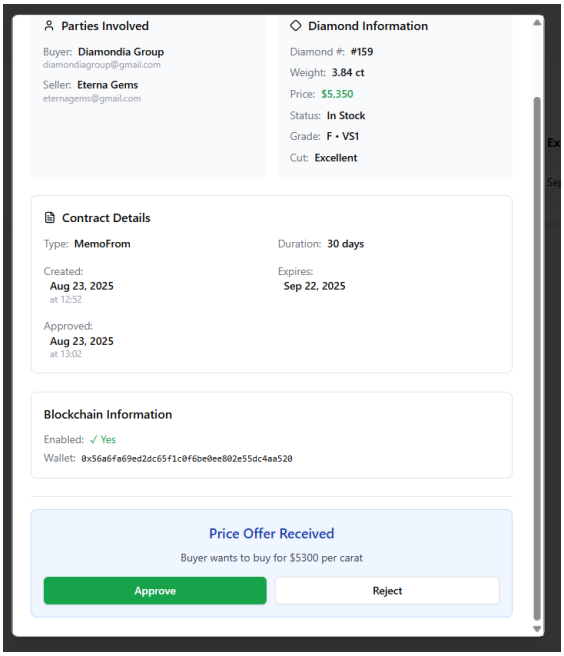


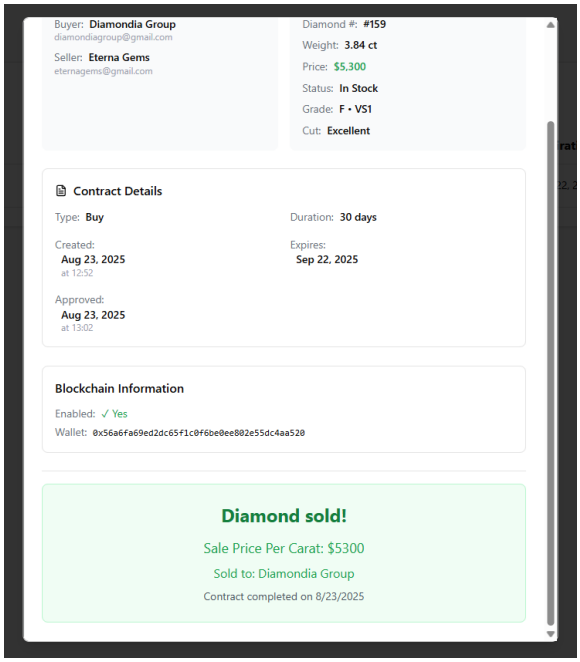
Contracts


Diamond Zone
Dashboard
Inventory
Contracts
Marketplace
Contract Management
Create and manage diamond contracts
Create Contract
Recent Contracts
Search contracts...
Contract # Type Diamond Details Created Expiration Status Actions
#204 Sell #159 30 days Aug 23, 2025 at 12:52 Sep 22, 2025 completed
#205 Memo From #160 30 days Aug 23, 2025 at 13:11 Sep 22, 2025 approved
#206 Memo To #155 30 days Aug 23, 2025 at 13:11 Sep 22, 2025 approved
#208 Memo From #161 30 days Aug 23, 2025 at 13:25 Sep 22, 2025 pending

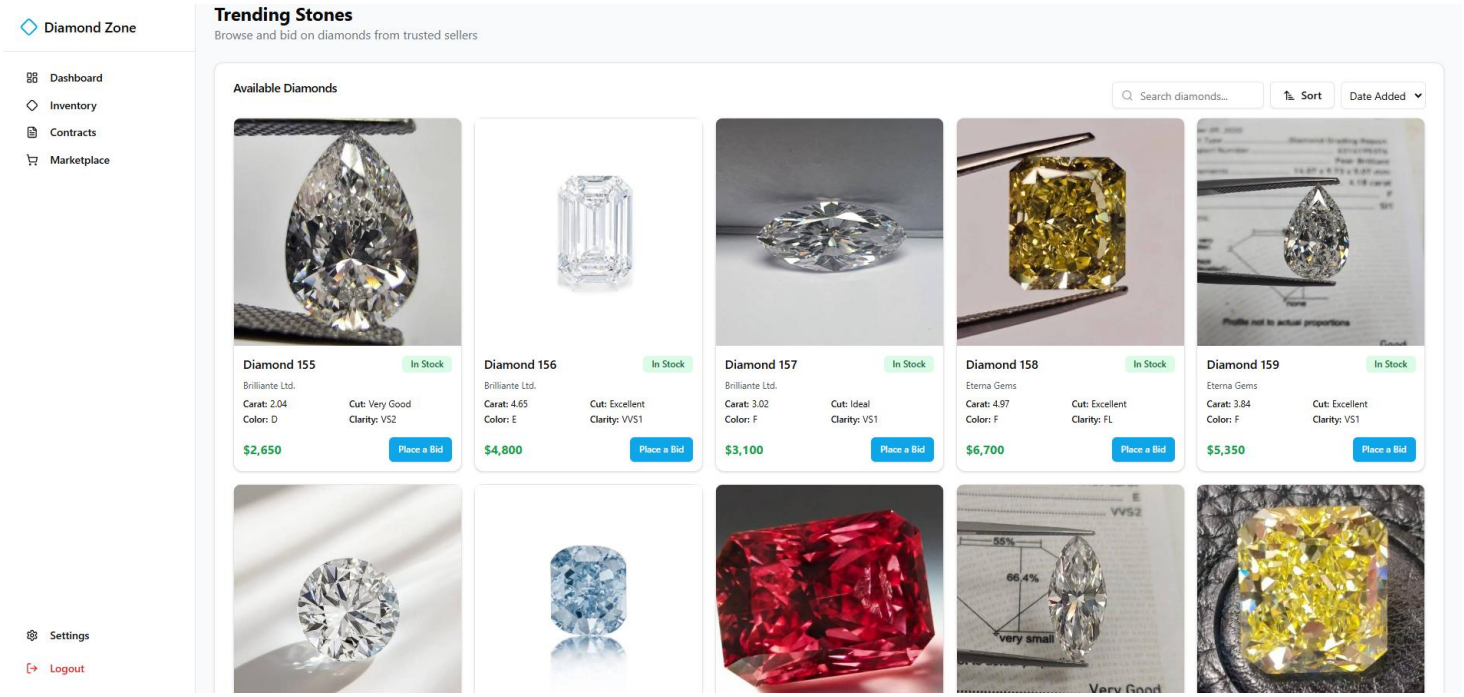

Contract #204 pending
Memo To • Created Aug 23, 2025 at 12:52
Parties Involved
Buyer: Diamondia Group
diamondiagroup@gmail.com
Seller: Eterna Gems
eternagems@gmail.com
Diamond Information
Diamond #: #159
Weight: 3.84 ct
Price: $5,350
Status: In Stock
Grade: F • VS1
Cut: Excellent
Contract Details
Type: MemoFrom
Duration: 30 days
Created: Aug 23, 2025 at 12:52
Expires: Sep 22, 2025
Blockchain Information
Enabled: ✓ Yes
Wallet: 0x56a6fa69ed2dc65f1c0f6be0ee802e55dc4aa520
Approve Contract
Reject Contract
MetaMask
Transfer request
0 ETH
From Account 2
To Alert 0x9a2c1...256bf
Network Ganache Local
Request from HTTP localhost:5173
Network fee 0.0075 ETH
Speed
Cancel
Confirm

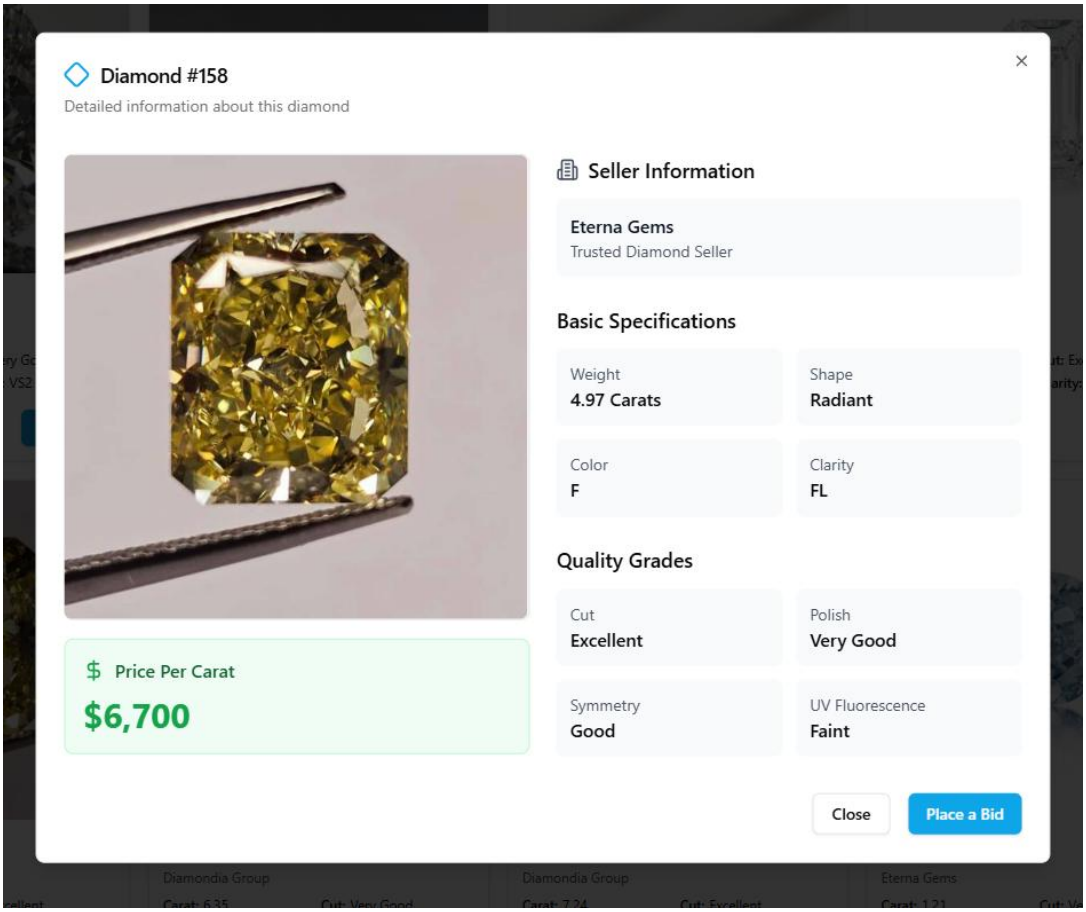

Buy Diamond #159
Enter the price you're willing to pay for this diamond. The seller will review your offer.
Price Per Carat (USD)
$ 5300
Cancel
Send Offer

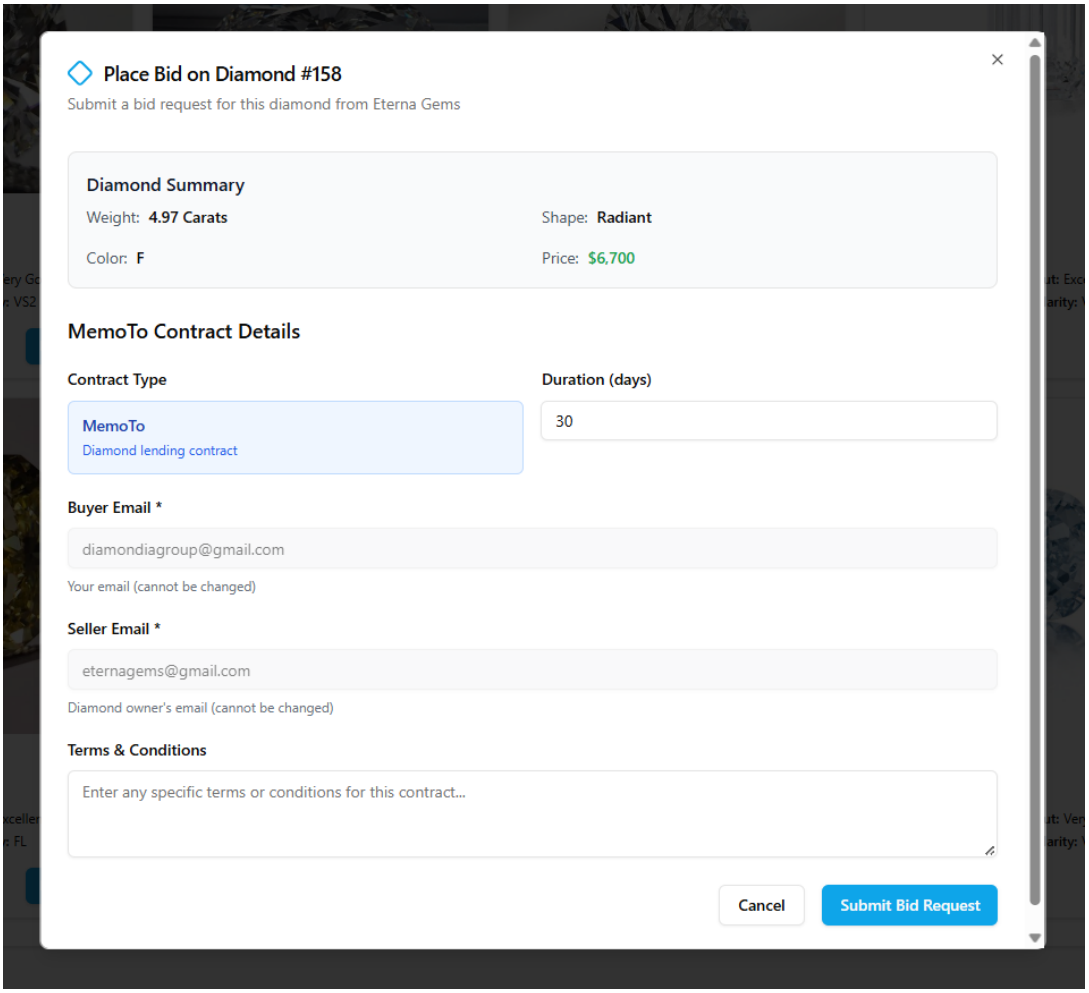

Parties Involved
Buyer: Diamondia Group
diamondiagroup@gmail.com
Seller: Eterna Gems
eternagems@gmail.com
Diamond Information
Diamond #: #159
Weight: 3.84 ct
Price: $5,350
Status: In Stock
Grade: F • VS1
Cut: Excellent
Contract Details
Type: MemoFrom
Duration: 30 days
Created: Aug 23, 2025 at 12:52
Expires: Sep 22, 2025
Approved: Aug 23, 2025 at 13:02
Blockchain Information
Enabled: ✓ Yes
Wallet: 0x56a6fa69ed2dc65f1c0f6be0ee802e55dc4aa520
Price Offer Received
Buyer wants to buy for $5300 per carat
Approve
Reject


Buyer: Diamondia Group
diamondiagroup@gmail.com
Seller: Eterna Gems
eternagems@gmail.com
Diamond #: #159
Weight: 3.84 ct
Price: $5,300
Status: In Stock
Grade: F • VS1
Cut: Excellent
Contract Details
Type: Buy
Duration: 30 days
Created: Aug 23, 2025 at 12:52
Expires: Sep 22, 2025
Approved: Aug 23, 2025 at 13:02
Blockchain Information
Enabled: ✓ Yes
Wallet: 0x56a6fa69ed2dc65f1c0f6be0ee802e55dc4aa520
Diamond sold!
Sale Price Per Carat: $5300
Sold to: Diamondia Group
Contract completed on 8/23/2025

Marketplace






Place Bid on Diamond #158
Submit a bid request for this diamond from Eterna Gems
Diamond Summary
Weight: 4.97 Carats
Shape: Radiant
Color: F
Price: $6,700
MemoTo Contract Details
Contract Type
MemoTo
Diamond lending contract
Duration (days)
30
Buyer Email *
diamondiagroup@gmail.com
Your email (cannot be changed)
Seller Email *
eternagems@gmail.com
Diamond owner's email (cannot be changed)
Terms & Conditions
Enter any specific terms or conditions for this contract...
Cancel
Submit Bid Request

Summery

The Diamond Zone system, as we described, is an accessible platform that can be used from any device without requiring integration. The system is available to the diamond trading community for diamond trade and inventory management.

The system is based on Blockchain infrastructure and smart contracts for executing diamond trade transactions. It allows any diamond merchant with a computer and a digital wallet to trade diamonds and utilize the services on the site without requiring prior knowledge of Blockchain, smart contracts, or code reading.

The purpose of the system is to enable diamond merchants to centralize the community's interests into a single platform, enhance transaction transparency, and bring the diamond trading community to the forefront of today's technology.

In developing the idea, we are collaborating with members of the Diamond Exchange in Israel to tailor the product to their needs.

The challenges ahead include marketing the product to members of the Diamond Exchange in Israel. Diamond merchants currently use various platforms, and our product provides a solution in a single platform. Thus, transitioning to our platform may be accompanied by challenges.

Facing these challenges, launching the Diamond Zone system requires a strong and effective marketing strategy, particularly among members of the Israeli Diamond Exchange. Our goal is to convince the community that transitioning to our platform is not just a technological change but an improvement in transparency, efficiency, and reliability in diamond transactions.

The Diamond Zone system provides a platform that unifies all trading and inventory management activities in one place, without requiring prior knowledge of Blockchain technologies, while maintaining user-friendliness and accessibility from any device.

Our vision is to bring the diamond trading community to the forefront of modern technology, creating a new standard for diamond trade while preserving the needs of users and ensuring a simple and accessible user experience.