

# Software Requirements Specification

for

## ChainStore

Version 1.0

Prepared by

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## 1 Introduction

### 1.1 Document Purpose

This SRS document outlines the software requirements for an ecommerce platform that operates on the web3 blockchain. The current release version of the platform is v1.0. It aims to provide a decentralized and secure online marketplace for buyers and sellers. The scope of this SRS covers the entire platform, including all subsystems and functionalities.

### 1.2 Product Scope

This Web3 ecommerce platform, Mirrorball, is a decentralised online marketplace that leverages blockchain technology and smart contracts to facilitate secure and transparent transactions between buyers and sellers. The platform provides a direct peer-to-peer environment, eliminating intermediaries such as banks or payment processors, and allowing users to maintain control over their own data and funds. The platform also offers enhanced privacy and security features, such as the ability to encrypt personal and financial data using cryptographic protocols.

Mirrorball will be a decentralized application (dApp) built on blockchain technology. The platform will allow users to buy and sell products using cryptocurrencies and other digital assets. The platform will provide a secure and transparent environment for transactions by leveraging blockchain's immutable ledger technology. The platform will support various features, including a user-friendly interface, product listings, product search, shopping cart, checkout, and order management.

The platform will have two types of users: buyers and sellers. Buyers will be able to browse and search for products, add items to their cart, and place orders. Sellers will be able to list products for sale, manage their inventory, and fulfill orders. The platform will also have an admin panel that will enable the platform owner to manage user accounts, monitor transactions, and perform other administrative tasks.

### 1.3 Intended Audience and Document Overview

The primary audience for this SRS document includes the development team responsible for building the web3 ecommerce platform. Other stakeholders, such as product owners, project managers, investors, quality assurance testers and regulatory authorities, may also refer to this document to understand the requirements and functionalities of the platform along with the client.



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We recommend that readers begin with the Overview section and then proceed to the sections that are most relevant to their role in the development process. Developers may be most interested in the Technical Requirements section, while project managers may find the General Requirements and User Requirements sections most pertinent. Quality assurance professionals may wish to read all sections to ensure comprehensive testing and validation of the platform.

When reading this document, it is recommended to start with the Introduction section to understand the purpose and scope of the document. After that, the Overall Description section provides a broad understanding of the platform and its components. The Specific Requirements section provides detailed requirements for developers and project managers, while the Non-functional Requirements section is pertinent to both technical and business stakeholders. Finally, the Other Requirements section provides any additional information that may be relevant to specific stakeholders.

## **1.4 Definitions, Acronyms and Abbreviations**

### **1.4.1 API**

Application Programming Interface

### **1.4.2 Blockchain Technology**

A system in which a record of transactions, especially those made in a cryptocurrency, is maintained across computers that are linked in a peer-to-peer network.

### **1.4.3 dApp**

Decentralized applications (dApps) are digital applications or programs that exist and run on a blockchain or peer-to-peer (P2P) network of computers instead of a single computer. DApps (also called "dapps") are thus outside the purview and control of a single authority.

### **1.4.4 Ecommerce**

Ecommerce (electronic commerce) refers to all online activity that involves the buying and selling of products and services.

### **1.4.5 Ethereum**

Ethereum is a decentralized blockchain platform that establishes a peer-to-peer network that securely executes and verifies application code, called smart contracts.

### **1.4.6 HTTPS**

Hypertext Transfer Protocol Secure



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#### **1.4.7 IPFS**

The InterPlanetary File System (IPFS) is a protocol, hypermedia and file sharing peer-to-peer network for storing and sharing data in a distributed file system.

#### **1.4.8 MetaMask**

MetaMask is a software cryptocurrency wallet used to interact with the Ethereum blockchain. It allows users to access their Ethereum wallet through a browser extension or mobile app, which can then be used to interact with decentralized applications.

#### **1.4.9 Smart Contracts**

Smart contracts are simply programs stored on a blockchain that run when predetermined conditions are met.

#### **1.4.10 Solidity**

Solidity is an object-oriented programming language for implementing smart contracts on various blockchain platforms, most notably, Ethereum.

#### **1.4.11 Web3**

Web3 (also known as Web 3.0) is an idea for a new iteration of the World Wide Web which incorporates concepts such as decentralization, blockchain technologies, and token-based economics.

### **1.5 References and Acknowledgments**

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5. R.S. Kumar, "An overview of the expected influence of web 3.0 on e-commerce and allied domains."



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## 2 Overall Description

### 2.1 Product Perspective

The web3 ecommerce platform “Mirrorball”, is a new, self-contained product designed to provide a secure and decentralized ecommerce experience for both buyers and sellers. Mirrorball is built on top of blockchain technology and utilizes smart contracts to facilitate transactions, ensuring that all parties involved in a transaction can trust the authenticity of the exchange.

Mirrorball is not a replacement for any existing systems but is instead an innovative solution that provides a new way of conducting e-commerce transactions. Its aim is to provide a platform that is secure, transparent, and cost-effective. The platform will enable small businesses and individuals to participate in the global economy without the need for intermediaries.

Mirrorball will allow buyers to purchase goods and services with cryptocurrency, providing a new level of financial privacy and security. Sellers will be able to receive payments in cryptocurrency, which they can then exchange for their local currency or hold as an investment.

#### 2.1.1 System Interface

The platform will be built on top of a blockchain network such as Ethereum or Binance Smart Chain, which will serve as the underlying technology for recording all transactions and interactions. The platform's smart contracts will be written in Solidity, while the frontend will be developed using modern web development frameworks such as React.

#### 2.1.2 User Interface

The new system shall provide a very intuitive and user-friendly interface to the users, where they can easily browse and search for products, view product descriptions, and make purchases using cryptocurrencies. The platform shall also provide a seller dashboard where sellers can easily manage their inventory, view their sales reports, and fulfill orders.

#### 2.1.3 Hardware Interface

##### a) Server-side

The platform will be hosted on a decentralized network, which means that the hardware requirements will be minimal. The platform's smart contracts will be deployed on the blockchain network, while the frontend will be hosted on IPFS.

##### b) Client-side

Users will require an internet-connected device with a modern web browser that supports Web3 technologies such as MetaMask or WalletConnect.

#### 2.1.4 Software Interface

##### a) Server-side



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The platform's smart contracts will interact with the blockchain network to record all transactions and interactions. The platform shall also use a decentralized storage solution such as IPFS to store product images and descriptions.

b) Client-side

The platform shall interact with Web3 wallets such as MetaMask or WalletConnect to enable users to make transactions using cryptocurrencies.

#### **2.1.5 Communication Interfaces**

The platform shall use the Web3 API to communicate with the blockchain network and Web3 wallets. The platform shall also use HTTPS to encrypt all communications between the client and server.

#### **2.1.6 Memory Constraints**

Memory constraints will come into play when the size of the IPFS storage grows to a considerable size. However, since IPFS is a decentralized storage solution, the platform can easily scale up its storage capacity by adding more nodes to the network.

#### **2.1.7 Operations**

The platform shall have operations to ensure the security and privacy of all transactions. The platform shall also have backup and recovery procedures in place to protect against data loss or corruption.

#### **2.1.8 Site Adaptation Requirements**

The platform shall be designed to be easily adaptable to different languages and currencies, enabling users from different countries to use the platform without any difficulty.

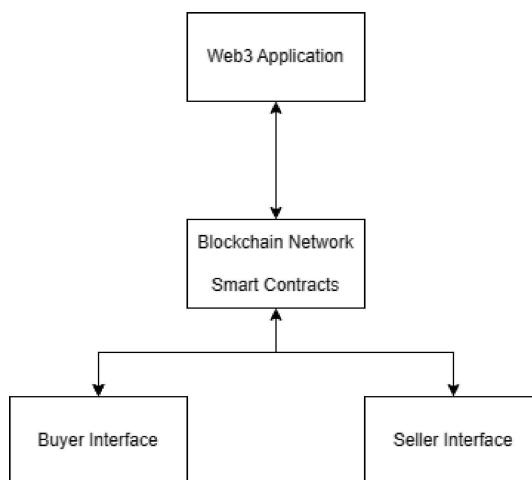


Figure 1: Major components of Mirrorball and how it interacts with the environment



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## 2.2 Product Functionality

### 2.2.1 Major Functions of the System

Major Functions of the System include:

- User registration and account management
- Product browsing and search functionality
- Shopping cart management
- Order placement and payment processing
- Order tracking and shipment management
- Review and rating system for products
- Seller account management and product listing
- Inventory management for sellers
- Customer support and feedback management
- Marketing and promotional tools for sellers

### 2.2.2 Data Flow of the Application

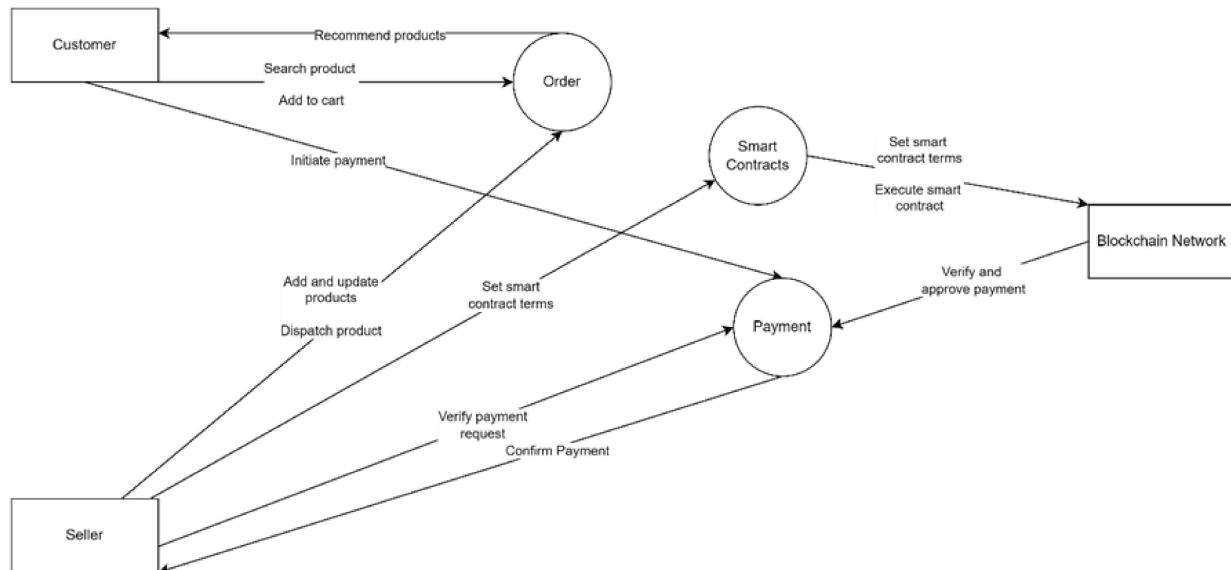


Figure 2: Data Flow Diagram of the Application

## 2.3 Users and Characteristics

### 2.3.1 Buyers

Buyers are the primary users of the ecommerce platform. They may have varying levels of technical expertise and educational background, but all share the common goal of purchasing goods or services. They may also differ in terms of their frequency of use, with some using the



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platform on a daily basis and others only occasionally. Security is an important concern for buyers, as they want to be assured that their personal and financial information is kept confidential and secure.

### **2.3.2 Sellers**

Sellers are the merchants who use the platform to sell their products or services. They may be individuals or businesses, and may have varying levels of technical expertise. They are responsible for managing their own product listings, inventory, and pricing on the platform. Security and privacy are also important concerns for sellers, as they want to protect their own financial and proprietary information.

### **2.3.3 Customer Support Representatives**

Customer support representatives are responsible for providing assistance to buyers and sellers who encounter issues while using the ecommerce platform. They may have varying levels of technical expertise, but should be skilled in communicating with users in a helpful and professional manner. They may also require access to sensitive user information in order to resolve certain issues, so security and privacy are also important concerns for them.

### **2.3.4 Technical Support Representatives**

Technical support representatives are responsible for providing assistance to users who encounter technical issues while using the platform. They require a high level of technical expertise and familiarity with the platform's underlying technology. They may also be responsible for maintaining the platform's infrastructure and resolving issues related to scalability and reliability.

### **2.3.5 Administrators**

Administrators are responsible for managing the platform and ensuring that it is running smoothly. They may have varying levels of technical expertise, but should be familiar with the platform's underlying technology and able to make changes to its configuration as needed. They are also responsible for ensuring the security and privacy of user data, as well as maintaining compliance with relevant regulations and standards.

### **2.3.6 Marketing and Sales Personnel**

Marketing and sales personnel are responsible for promoting the platform and attracting new users. They may have varying levels of technical expertise, but should be skilled in communicating the platform's value proposition to potential users. They may also be responsible for developing and managing marketing campaigns and partnerships with other businesses or organizations.

### **2.3.7 Data Analysts**

Data analysts are responsible for analyzing user data and providing insights to help improve the platform's performance and user experience. They require a high level of technical expertise



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and familiarity with data analysis tools and techniques. They may also be responsible for developing and maintaining the platform's analytics infrastructure.

The most important users for the ecommerce platform are the buyers and sellers, as they are the primary users who generate revenue for the platform. Customer support representatives and technical support representatives are also critical for ensuring a positive user experience and resolving issues that may arise. Administrators are important for ensuring the platform's overall security, compliance, and reliability. While marketing and sales personnel and data analysts are important for promoting and improving the platform, they are generally less critical for the day-to-day functioning of the platform compared to the other user groups.

## **2.4 Operating Environment**

Mirrorball is a decentralized application that aims to provide a secure, transparent and efficient ecommerce solution using blockchain technology. The platform allows buyers and sellers to interact with each other directly, without the need for intermediaries, such as payment gateways or escrow services. The platform will be built using the following technologies:

- Ethereum blockchain
- Solidity smart contract language
- React.js framework

### **2.4.1 Hardware Platform**

Mirrorball is a decentralized application that runs on the Ethereum blockchain. Therefore, it can be accessed from any device that supports an Ethereum wallet, such as MetaMask or MyEtherWallet.

### **2.4.2 Operating System and Versions**

Mirrorball can be accessed from any operating system that supports an Ethereum wallet. This includes but is not limited to:

- Windows (7, 8, 10)
- MacOS (10.13 High Sierra and later)
- Linux (Ubuntu, Debian, Fedora, etc.)

### **2.4.3 Software Components**

Mirrorball relies on several software components and applications to function properly. These include:

- Ethereum network nodes
- Ethereum wallet software (MetaMask, MyEtherWallet, etc.)
- Web3.js library for Ethereum interaction



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- React.js framework for frontend development
- Solidity smart contract language for smart contract development
- IPFS (InterPlanetary File System) for file storage and retrieval

#### 2.4.4 Subsystem Interconnections

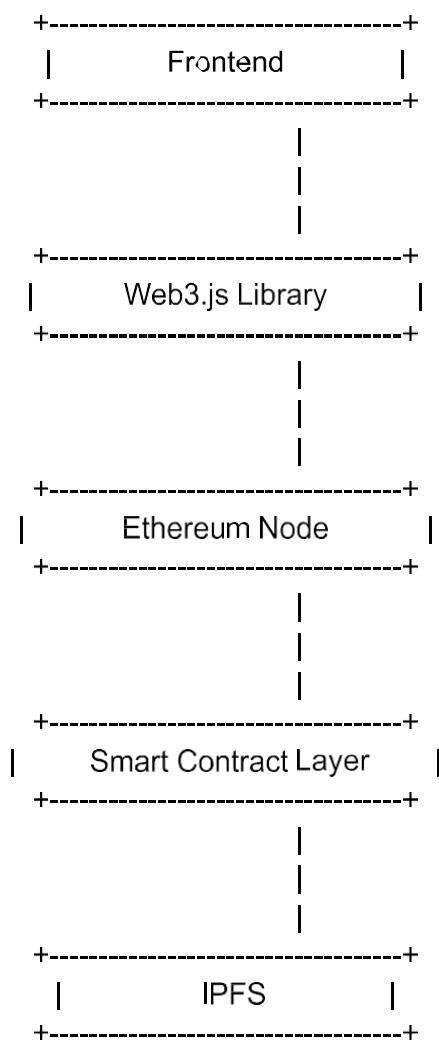


Figure 3: Major Components of Mirrorball and their Interconnections

#### 2.4.5 External Interfaces

The Web3 Ecommerce Platform interacts with several external interfaces, including:

- Ethereum network nodes



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- Ethereum wallet software (MetaMask, MyEtherWallet, etc.)
- Payment gateways (PayPal, Stripe, etc.) for fiat currency payments
- Shipping carriers (UPS, FedEx, etc.) for product shipments
- APIs for product information retrieval

Thus, the Web3 Ecommerce Platform operates in a decentralized environment that relies on several software components and applications to function properly. The platform leverages blockchain technology to provide a secure and transparent ecommerce solution that eliminates the need for intermediaries. The platform can be accessed from any device that supports an Ethereum wallet, and it interacts with several external interfaces to provide a seamless ecommerce experience.

## **2.5 Design and Implementation Constraints**

### **2.5.1 Memory Constraints**

Since the platform will be built on a blockchain network, memory constraints will be an important consideration. Smart contract code on the blockchain network must be kept to a minimum to ensure efficient use of resources.

### **2.5.2 Timing Constraints**

The platform will need to ensure that all transactions are processed in a timely manner. The blockchain network's speed will affect how quickly transactions are processed, and the platform will need to take this into account to ensure a smooth user experience.

### **2.5.3 Security Considerations**

The platform will need to ensure that user data and transactions are secure. This will involve implementing security measures such as encryption and authentication, as well as ensuring that smart contracts are secure and free from vulnerabilities.

### **2.5.4 Communication Protocols**

The platform will need to communicate with the blockchain network, as well as with other external systems such as payment processors. The platform will need to use appropriate communication protocols to ensure that data is transmitted securely and reliably.

### **2.5.5 Language Requirements**

Smart contracts will be written in Solidity, and the frontend will be developed using modern web development frameworks such as React. Developers working on the platform will need to be proficient in these languages and frameworks.

### **2.5.6 Design Conventions/Programming Standards**

The platform will need to adhere to design conventions and programming standards to ensure consistency and maintainability. The customer's organization may have their own standards that



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the platform will need to adhere to, or the platform may need to follow industry-standard conventions and best practices.

### **2.5.7 Parallel Operations**

The platform will need to handle multiple transactions and interactions simultaneously. The blockchain network's ability to handle parallel operations will be an important consideration when designing the platform.

### **2.5.8 Third-Party Interfaces**

The platform may need to interface with third-party systems such as payment processors or shipping providers. The platform will need to ensure that these interfaces are secure, reliable, and meet the requirements of the external systems.

## **2.6 User Documentation**

For the SRS of a web3 ecommerce platform, the user documentation components that will be delivered along with the software include user manuals, on-line help, and tutorials. The user manuals will provide step-by-step instructions on how to use the ecommerce platform, including how to create an account, browse products, add items to the cart, checkout, and track orders. The on-line help will be available through the platform itself, providing users with quick access to answers to common questions and issues they may encounter while using the platform. The tutorials will provide users with more in-depth information on how to use specific features of the platform, such as how to set up and manage a store or how to use the platform's smart contract functionality. The user documentation will adhere to established standards and delivery formats, such as the W3C's Web Content Accessibility Guidelines (WCAG) and the Portable Document Format (PDF).

## **2.7 Assumptions and Dependencies**

### **2.7.1 Assumptions**

- Users of the platform are familiar with using cryptocurrencies and are comfortable using digital wallets to make purchases.
- The platform will have reliable access to the blockchain network it is built on and that there will be no major technical issues with the network.
- The platform will be used primarily by users with internet-connected devices and modern web browsers that support Web3 technologies.
- The platform will not need to integrate with any legacy systems or platforms.
- Sellers will be able to handle cryptocurrency payments and are comfortable exchanging them for their local currency or holding them as investments.



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- The platform will not have to comply with any specific legal or regulatory requirements beyond standard ecommerce regulations.

### **2.7.2 Dependencies**

- The platform will rely on the stability and security of the chosen blockchain network and any third-party software libraries used in the development process.
- The platform will need to integrate with digital wallets such as MetaMask or WalletConnect, and any other third-party payment providers that may be used.
- The platform's frontend will be hosted on IPFS, so the availability and performance of IPFS will be a critical dependency.
- The platform will rely on modern web development frameworks such as React, which will need to be kept up-to-date and maintained to ensure compatibility and security.

## **3 Specific Requirements**

### **3.1 External Interface Requirements**

#### **3.1.1 User Interfaces**

##### **3.1.1.1 Buyer Interface**



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The buyer interface will allow buyers to browse products, search for specific items, add items to their cart, and checkout. The interface should have a clean and simple design, with clear navigation and search functionality. Sample screens may include a home page featuring top products, a search results page, a product detail page, and a shopping cart and checkout page. The checkout page will include a crypto payment interface that will allow buyers to pay for their purchases using cryptocurrencies. The crypto payment interface should be designed to be user-friendly, secure, and efficient.

#### **3.1.1.2 Seller Interface**

The seller interface will allow sellers to manage their product listings, view sales and revenue data, and interact with customers. The interface should have a dashboard-like design, with an overview of sales data and product performance. Sample screens may include a product listing management page, a sales dashboard, and a customer interaction page. The seller interface should also include a crypto payment interface that will allow sellers to receive payments for their products in cryptocurrencies. The crypto payment interface should be designed to be easy to use and secure.

#### **3.1.1.3 Customer Support Interface**

The customer support interface will allow customer support representatives to view and manage support requests from buyers and sellers. The interface should have clear and organized ticket management functionality, with the ability to assign and escalate tickets as needed. Sample screens may include a ticket management dashboard, a ticket detail page, and a customer profile page. The customer support interface should also include a crypto payment interface that will allow customer support representatives to issue refunds or process payments to buyers or sellers using cryptocurrencies.

#### **3.1.1.4 Technical Support Interface**

The technical support interface will allow technical support representatives to view and manage technical support requests from buyers and sellers. The interface should have clear and organized ticket management functionality, with the ability to escalate tickets to engineering teams as needed. Sample screens may include a ticket management dashboard, a ticket detail page, and a system configuration page. The technical support interface should also include a crypto payment interface that will allow technical support representatives to issue refunds or process payments to buyers or sellers using cryptocurrencies.

#### **3.1.1.5 Administrator Interface**

The administrator interface will allow administrators to manage the overall platform configuration, security, and compliance. The interface should have a hierarchical design, with different levels of access and functionality for different types of administrators. Sample screens may include a system configuration page, a security and compliance management page, and a user management page. The administrator interface should also include a crypto payment



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interface that will allow administrators to manage and monitor crypto transactions on the platform.

MIRRORBALL

Drops Marketplace Featured



# Digitally Authentic Goods

the best of digital culture.

Browse Marketplace



Figure 4.1 Landing Page



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Featured drops. All Explore all drops

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Upcoming August 20 at 10am CET

**Collezione Genesi**

This bespoke, hand-crafted collection was personally designed by Domenico Dolce and Stefano Gabbana exclusively for UNXD.

@Dolce&Gabbana + 5 creators Get notified

---

Now live! 01d 14h 23min left

**Icons Unmasked II Open Editions**

Each shoe is represented by a 3D NFT of the shoe design, created by the MNTD studio. The MNTD platform is loaded with all of the shoes.

@Dolce&Gabbana + 5 creators

Figure 4.2 Featured Page

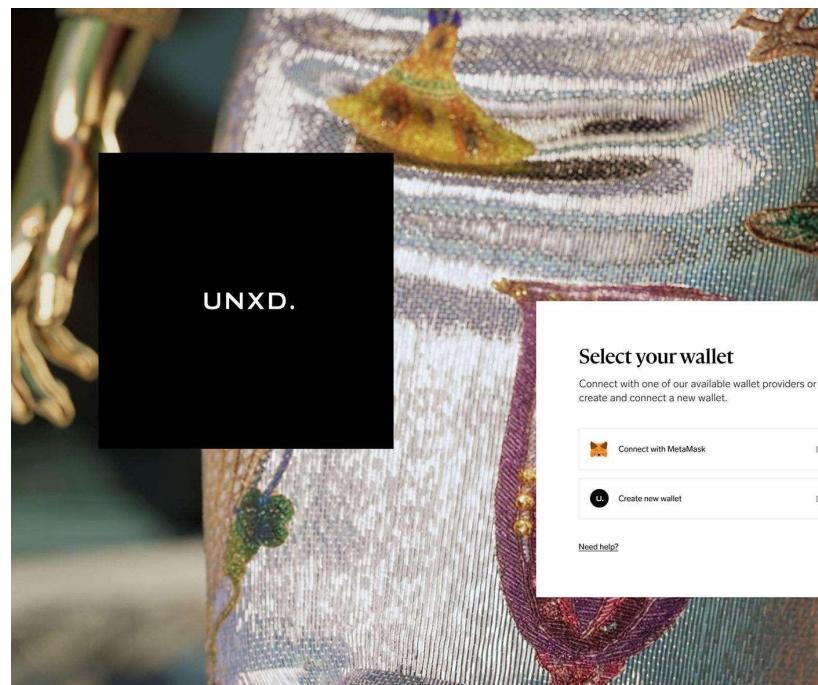


Figure 4.3 Wallet Connection Page



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## Accept Offer

It is a long established fact that a reader will be distracted by the readable content of a page when looking at its layout.

Figure 4.4 View Product Page

### 3.1.2 Hardware Interfaces

#### 3.1.2.1 Payment gateway interface

This interface allows the web3 ecommerce platform to communicate with the payment gateway to process payments securely and efficiently.

The interface supports various payment methods, including credit cards, debit cards, and cryptocurrencies.

The interface uses secure protocols to ensure the safety of transactions.

The interface integrates with the platform's checkout system to provide a seamless payment experience for users.

#### 3.1.2.2 Cryptocurrency wallet interface

This interface allows the web3 ecommerce platform to communicate with users' cryptocurrency wallets to process payments using digital currencies.

The interface supports various types of cryptocurrencies, including Bitcoin, Ethereum, and Litecoin.

The interface uses secure protocols to ensure the safety of transactions and user data.

The interface integrates with the platform's checkout system to provide a seamless payment experience for users.

#### 3.1.2.3 Barcode scanner interface

This interface allows the web3 ecommerce platform to communicate with barcode scanners to scan product barcodes for inventory management and order fulfillment purposes.



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The interface supports various types of barcode scanners, including handheld and stationary devices.

The interface uses libraries that provide easy integration with the platform's inventory management and order fulfillment systems.

#### **3.1.2.4 RFID reader interface**

This interface allows the web3 ecommerce platform to communicate with RFID readers to track products and manage inventory.

The interface supports various types of RFID readers, including handheld and stationary devices.

The interface uses libraries that provide easy integration with the platform's inventory management system.

#### **3.1.2.5 Printer interface**

This interface allows the web3 ecommerce platform to communicate with printers to generate receipts, shipping labels, and other documents.

The interface supports various types of printers, including thermal and inkjet printers.

The interface uses libraries that provide easy integration with the platform's order fulfillment and shipping systems.

#### **3.1.2.6 Mobile device interface**

This interface allows the web3 ecommerce platform to communicate with users' mobile devices to provide a mobile-responsive experience and push notifications.

The interface supports various types of mobile devices, including smartphones and tablets.

The interface uses libraries that provide easy integration with the platform's mobile app and notification systems.

### **3.1.3 Software Interfaces**

The software interface will be designed to work with a web3 ecommerce platform, which will run on a server with an operating system such as Linux or Windows. The interface will be built using programming languages and frameworks such as JavaScript, React, and Node.js.

The interface will communicate with the operating system through system calls and APIs provided by the operating system. For example, to facilitate crypto payments, the interface may need to interact with the operating system's cryptographic libraries to generate and verify digital signatures.

The interface will also interact with databases that store information about products, orders, and users. The database may be hosted on the same server as the web3 ecommerce platform or on a separate server.

In terms of data items or messages coming into the system and going out, the interface will receive requests from the web3 ecommerce platform to initiate crypto payments, and it will send responses back to the platform indicating the status of the payment transaction.

The interface will also need to communicate with external services, such as crypto wallets and payment processors, to facilitate the payment transactions. The nature of these communications will depend on the specific services being used.



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Data that will be shared across software components will include information about the products being sold, user account information, and order information. This data may be stored in a database or exchanged between the web3 ecommerce platform and the interface using APIs.

### **3.1.4 Communications Interfaces**

Mirrorball will require various communication interfaces to enable interaction with external entities. These interfaces will include email, web browser, and network server communication protocols such as HTTP and FTP. The platform will also need to support electronic forms to facilitate the entry of user information. To ensure secure communication, the platform will use encryption for data transfer. The specific encryption standards will be determined based on industry best practices and will be regularly reviewed and updated to maintain the highest level of security.

In addition to encryption, the platform will also implement authentication and authorization mechanisms to ensure that only authorized users have access to sensitive information. The platform will use standard communication protocols such as SSL/TLS to establish secure connections between the web server and the client browser. To ensure that data is transferred efficiently, the platform will implement data transfer rates that are consistent with industry standards. The platform will also use synchronization mechanisms to ensure that data is transferred correctly and that any changes made are reflected in real-time across all systems.

## **3.2 Functional Requirements**

### **3.2.1 User Management**

- The platform shall allow users to register for an account with email and password.
- The platform shall provide users with the ability to edit and update their personal information.
- The platform shall allow users to view their order history and track the status of their current orders.
- The platform shall provide users with the ability to leave reviews and ratings for products.

### **3.2.2 Product Management**

- The platform shall allow sellers to add and remove products from the catalog.
- The platform shall allow sellers to update product information, such as price and availability.
- The platform shall allow sellers to manage product categories and subcategories.
- The platform shall allow sellers to search for products using keywords and filters.

### **3.2.3 Ordering and Payment**

- The platform shall allow users to add products to a shopping cart and checkout.
- The platform shall support multiple payment methods, including cryptocurrency payments.



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- The platform shall generate a unique address for each cryptocurrency transaction and store the transaction data on the blockchain.
- The platform shall allow users to view the status of their payment transactions and receive confirmation of successful payments.

### **3.2.3 Blockchain Integration**

- The platform shall integrate with a blockchain to securely store transaction data and provide transparency and immutability.
- The platform shall allow administrators to view transaction data on the blockchain and verify the authenticity of payments.
- The platform shall use smart contracts to automate payment processes and ensure the fair exchange of value.

### **3.2.4 Security and Privacy**

- The platform shall implement secure communication protocols to protect user data and prevent unauthorized access.
- The platform shall use encryption to ensure the confidentiality of user data and payment transactions.
- The platform shall implement authentication and authorization mechanisms to control access to sensitive data and functions.
- The platform shall comply with relevant data protection regulations and guidelines, such as GDPR and CCPA.

### **3.2.5 Analytics and Reporting**

- The platform shall provide administrators with insights and analytics on user behavior and sales performance.
- The platform shall generate reports on product popularity, sales trends, and revenue.
- The platform shall allow administrators to export data for further analysis and processing.

## **3.3 Behaviour Requirements**

### **3.3.1 Use Case View**

#### **3.3.1.1 Use case diagram**



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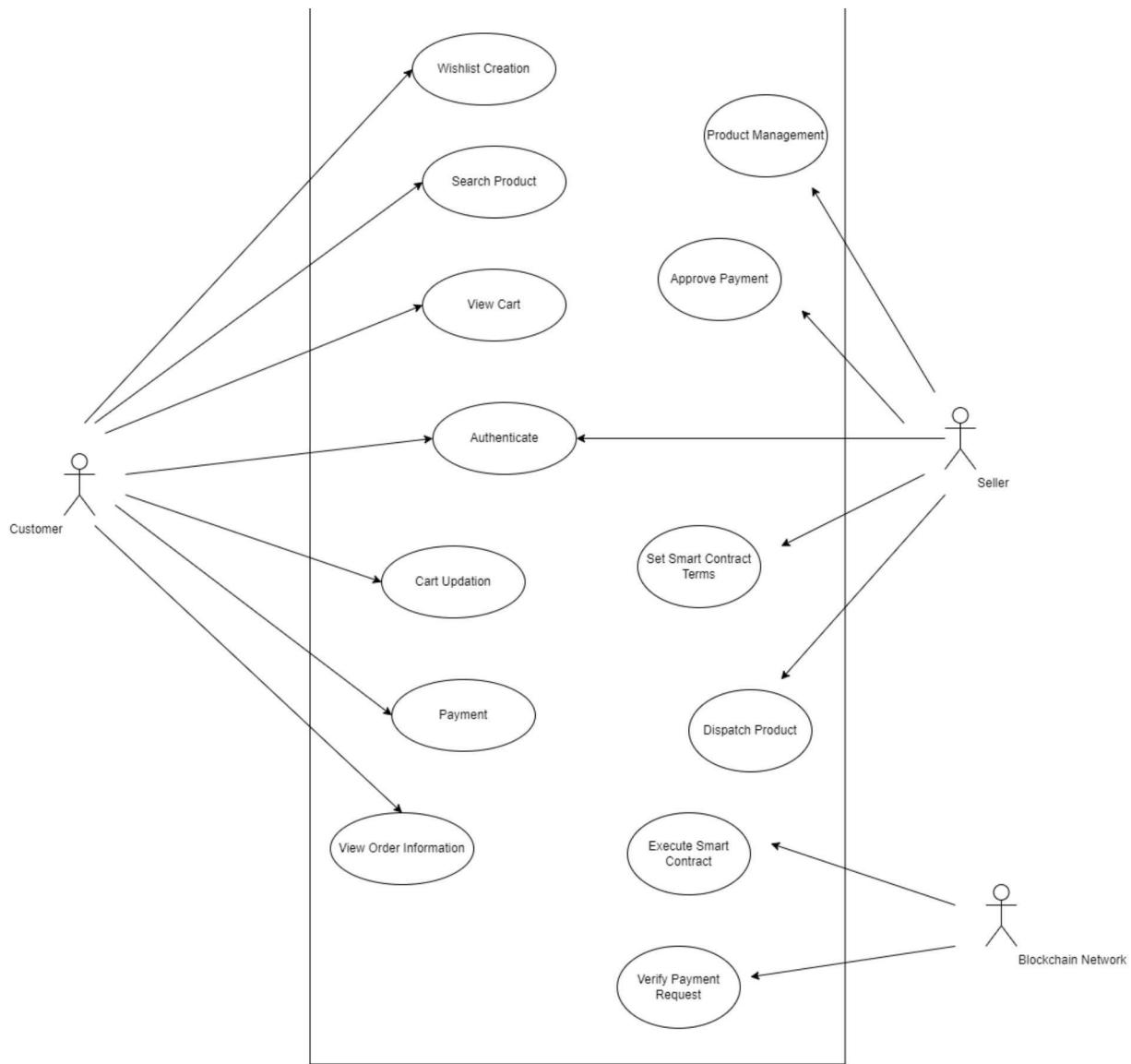


Figure 5: Use Case Diagram



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## 4 Other Non-functional Requirements

### 4.1 Performance Requirements

#### 4.1.1 Speed

Users expect the ecommerce application to be fast and responsive. Transactions should be processed quickly, and users should not experience long wait times.

#### 4.1.2 Scalability

The application should be able to handle a large number of users and transactions without experiencing performance issues. This is especially important during peak times such as holidays or flash sales.

#### 4.1.3 Security

Users want to know that their personal and financial information is secure. The application should have robust security features, such as encryption and multi-factor authentication, to prevent hacking and other forms of cyberattacks.

#### 4.1.4 Transparency

Blockchain technology allows for increased transparency in ecommerce transactions. Users should be able to track their purchases and ensure that they are getting what they paid for.

#### 4.1.5 Low fees

Blockchain technology can potentially reduce the fees associated with ecommerce transactions. Users expect to pay reasonable fees for their transactions and do not want to be charged exorbitant amounts.

#### 4.1.6 Reliability

Users expect the ecommerce application to be available and accessible whenever they need it. The application should have high uptime and minimal downtime.

#### 4.1.7 Ease of use

The ecommerce application should be intuitive and easy to navigate. Users should be able to find what they are looking for quickly and easily, and the checkout process should be straightforward and streamlined.



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## 4.2 Safety and Security Requirements

### 4.2.1 Privacy

Users want their personal and financial information to be kept private and secure. The ecommerce application should have robust privacy features, such as encryption and data protection, to prevent unauthorized access to user information.

### 4.2.2 Data integrity

Users expect the ecommerce application to be tamper-proof and to maintain data integrity. Blockchain technology provides a secure, decentralized ledger that ensures the accuracy and immutability of data.

### 4.2.3 Authentication

Users want to know that their transactions and interactions with the ecommerce application are secure. The application should have strong authentication mechanisms, such as multi-factor authentication, to prevent unauthorized access to user accounts.

### 4.2.4 Fraud prevention

Users expect the ecommerce application to have measures in place to prevent fraudulent activities, such as fake transactions or counterfeit products. The blockchain technology provides an auditable, tamper-proof record of all transactions, which helps prevent fraud.

### 4.2.5 Compliance

Users want to know that the ecommerce application is compliant with relevant laws and regulations, such as anti-money laundering (AML) and know-your-customer (KYC) regulations. The application should have measures in place to ensure compliance and prevent illegal activities.

### 4.2.6 Secure payments

Users expect the ecommerce application to have secure payment options, such as cryptocurrency payments, that prevent fraudulent activities and protect their financial information.

### 4.2.7 Protection against cyberattacks

Users expect the ecommerce application to be protected against cyberattacks, such as hacking and phishing attempts. The application should have strong security features, such as firewalls and intrusion detection systems, to prevent and mitigate cyberattacks.



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## 4.3 Software Quality Attributes

### 4.3.1 Reliability

Users expect the ecommerce application to be reliable and available whenever they need it. To achieve reliability, the application should be tested thoroughly and have a high uptime percentage. Also, a fault-tolerant architecture should be adopted that ensures that the system remains operational even in the event of hardware or software failures.

### 4.3.2 Scalability

The application should be able to handle a large number of users and transactions without experiencing performance issues. To achieve scalability, the application architecture should be designed to scale horizontally and vertically, and load testing should be performed to ensure that the system can handle a high volume of traffic.

### 4.3.3 Maintainability

The ecommerce application should be easy to maintain and update. To achieve maintainability, the application should be well-documented, modular, and have a clear separation of concerns. Also, continuous integration and delivery (CI/CD) practices should be adopted to facilitate the release of updates and new features.

### 4.3.4 Usability

The ecommerce application should be easy to use and navigate. To achieve usability, the application should have an intuitive user interface, clear navigation, and provide users with helpful feedback. User testing should be performed to ensure that the application is user-friendly and meets the needs of the target audience.

### 4.3.5 Security

The ecommerce application should be secure and protect user data and transactions. To achieve security, the application should implement best practices for security, such as encryption, multi-factor authentication, and regular security audits. Also, compliance with relevant laws and regulations should be ensured.

### 4.3.6 Performance

The ecommerce application should perform well and respond quickly to user requests. To achieve performance, the application should be optimized for speed and have a high throughput. Also, caching, indexing, and other performance-enhancing techniques should be used.

### 4.3.7 Testability

The ecommerce application should be easy to test and debug. To achieve testability, the application should be designed with testing in mind, and automated testing should be used to reduce the time and effort required for testing and debugging. Also, unit testing, integration



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testing, and end-to-end testing should be performed to ensure that the application meets the required quality standards.