Indian Institute of Information Technology, Lucknow

भारतीय सूचना प्रौद्योगिकी संस्थान, लखनऊ

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Blockchain Project

"Spheroid"

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Introduction to the Blockchain Proposal Assignment

Blockchain is rapidly transforming how various services are delivered, providing opportunities for innovation and disruption. This assignment invites you to harness your creativity and understanding of the blockchain ecosystem to propose a new company that addresses current challenges and leverages technological advancements using Blockchain

This proposal assignment offers you the opportunity to apply your knowledge in a practical context. You will explore the intricacies of the value chain, regulatory environments, and market dynamics to design a compelling Blockchain-based solution. Through this exercise, you will gain insights into the startup ecosystem, strategic analysis, and the challenges of launching a new venture

Your proposal will be evaluated on its originality, depth of analysis, feasibility, and the potential impact of your Blockchain-based solution. This is an opportunity to showcase your ability to innovate and think strategically, preparing you for future endeavors in the rapidly evolving Blockchain landscape

Assignment Objectives:

- To develop a comprehensive understanding of blockchain and identify opportunities for innovation
- To analyze regulatory frameworks and their implications on Blockchain-based operations
- To design a technological solution that addresses existing pain points and enhances user experience
- To assess market potential and devise strategies for competitive positioning and growth
- To articulate a clear and actionable plan for launching and sustaining a Blockchain startup

By the end of this assignment, you will have crafted a detailed proposal that not only demonstrates your theoretical knowledge but also your ability to apply it in real-world scenarios. We encourage you to think creatively and challenge existing norms, pushing the boundaries of what is possible in Blockchain-based solutions

Assignment Outline: Blockchain Proposal 'Spheroid'

1. Area of Focus: Commerce

Commerce is the backbone of the global economy, covering a vast array of transactions between merchants and consumers. Despite advancements in digital payments and e-commerce platforms, the sector still faces challenges related to security, transparency, efficiency, and regulatory compliance. Spheroid aims to address these issues by creating a secure, transparent, and user-friendly chain tailored specifically for commerce

2. Idea Description

Blockchain has the potential to improve all commerce-based services drastically. With blockchain, anyone can create more efficient services that are **non-custodial, decentralized, and free of rent-seeking middlemen**. However, all these benefits are dwarfed by the constant scams, smart contract hacks, and rug pulls plaguing the industry. If these problems are insufficient, the current UX forces users to safeguard and manage complex cryptographic keys or risk all their funds. (A simple example of this is that more than $30B was lost in 2022 alone)
Spheroid is an Arbitrum Orbit based L2 solution designed specifically for commerce, aimed at enhancing the security, transparency, and efficiency of commercial transactions. With its scalability and low transaction costs, we provide a dedicated infrastructure that caters to the unique needs of merchants and consumers such as instant payments and settlements, customer loyalty programs, and dispute resolution

Key features:

- **KYC Integration:** Mandatory KYC for all users and merchants to ensure trust and regulatory compliance

- **Merchant registry:** Merchants can register on a global registry, ensuring a standardized and transparent onboarding process

- **Walletless:** Traditional crypto wallets are known to create a 72%+ drop off in user adoption as they require users to download plugins, follow a series of complex setups, and confusing pop-ups, require users to understand and safely store seed phrases, and their UX, general, is hard for non-technical users. Hence

we are building Spheroid as a wallet less blockchain that abstracts away these complexities with chain abstraction implemented at a core and protocol level

- **Loyalty:** Merchants can issue loyalty tokens directly on-chain (instead of using centralized databases), enabling secure and transparent reward systems, as well as the points/rewards remain tradable or transferable without permissions

- **Payments and Settlements:** With cryptocurrency, payments can be facilitated and settled instantly, reducing transaction times from days to seconds, and with the onramp-offramp functionality both merchants and consumers can spend or accept money in any currency they want from any part of the world

- **Loans:** Users can access loans through Defi mechanisms, improving financial flexibility and supporting commerce growth (already proven effective in e-commerce with services like BNPL, etc)

- **Anti-money laundering (AML) compliance:** AML checks are conducted at the sequencer stage before transactions are submitted to the chain, ensuring regulatory compliance

- **Disputes:** We utilize smart contracts to enforce terms of agreements automatically, minimizing the need for intermediaries in dispute resolution, and all the resolutions remain secure and transparent which can be challenged later

- **Taxation:** We integrate automated tax calculation tools that comply with regional tax regulations and ensure all tax and invoicing processes adhere to local and international regulations, ensuring accurate and timely tax reporting for merchants

- **Invoicing:** Spheroid generates immutable and transparent invoices, facilitating easier auditing and compliance for both merchants and users

3. Domain Understanding

a. The value chain for blockchain-based commerce includes several key stages:

    - **User onboarding and Identity verification:**
      The first step is user registration to the system by performing a Know Your Customer process. KYC ensures that all participants are verified, reducing fraud and ensuring compliance with legal and regulatory frameworks. This

is a simple web2-like process, with account abstraction hiding complex blockchain interactions

- **Payment processing:**
  Spheroid enables instant payments and settlements using stablecoins, making it ideal for global commerce. This also eliminates the need for traditional financial intermediaries which reduces the transaction costs and delays often associated with cross-border payments

- **Merchant registration and management:**
  Merchants are required to register with a global on-chain registry to ensure transparency and traceability. They undergo a KYC process, where they need to provide necessary business details such as registration information and country of governance. This makes the system robust and compliant with regional laws while empowering merchants to manage their operations

- **Loyalty and rewards management:**
  Spheroid has on-chain loyalty programs that allow merchants to offer rewards to customers, creating better engagement and retention. Blockchain ensures that these loyalty programs are interoperable and transparent and give customers complete visibility of their earned rewards

- **Tax and Invoice management:**
  Taxes and invoices, everything is handled automatically through the blockchain. Automatic calculation, deduction, and reporting of taxes, as well as invoice generation, all on-chain for transparency. This means that merchants don't need to rely on or trust manual processes or third-party software. Spheroid's system ensures transparency in tax calculations and provides verifiable and immutable invoices

- **Commerce management:**
  Spheroid is a unified platform that lets users manage their commerce activities in one place. This includes tracking purchases, monitoring loyalty programs, and managing payments. The simplicity and ease of having a single interface for all commerce-related tasks makes it user-friendly and efficient

- **Financing solutions:**
  Spheroid provides on-chain credit mechanisms that allow users and

merchants to access quick and fair loans. It eliminates traditional barriers to financing by assessing creditworthiness through blockchain data and provides fast, transparent solutions for liquidity challenges

Spheroid fits seamlessly into this value chain by integrating these stages on a specialized Arbitrum Orbit-based chain optimized for commerce. The platform provides a fully compliant and user-friendly ecosystem that eliminates the complexity of blockchain adoption through account abstraction and Web2-like interfaces

b. The current commerce value chain relies heavily on centralized intermediaries and suffers from the following pain points:
    - **Identity verification challenges:**
      Verification processes for both users and merchants are fragmented across multiple platforms, leading to inconsistencies and making it easier for fraudulent activities to occur. There is a lack of standardized, robust KYC mechanisms, which undermines trust in the system

    - **High transaction costs:**
      Cross-border payments often involve multiple intermediaries like banks and payment processors. Each intermediary imposes fees, and the process is slow, sometimes taking days to finalize transactions. This increases costs for both merchants and users

    - **Lack of transparency:**
      Merchant operations, loyalty programs, and tax calculations often lack visibility. Users cannot easily verify their loyalty rewards, merchants face disputes over opaque tax calculations, and there is little accountability for how data and payments are handled

    - **Customer retention issues:**
      Traditional loyalty programs are operated independently by merchants, creating silos. Customers are **unable to use or transfer loyalty rewards** across platforms, limiting their value and reducing customer engagement

    - **Inefficient tax and invoice processes:**
      Tax calculations and invoicing often rely on manual processes or outdated software, leading to errors and inefficiencies. These inefficiencies cost time and money for merchants while complicating compliance with tax

regulations

- **Limited financial access:**
  Many small businesses and users face difficulty accessing loans or credit due to rigid assessment criteria and high interest rates imposed by traditional financial institutions. This lack of access to financial resources hinders growth and economic participation

c. Spheroid will address and disrupt the following steps:
   - **Identity verification (user and merchant):**
     - Objective**:** To ensure the platform's ecosystem remains secure, fraud-proof, and legally compliant
     - Implementation:
       - Users: For a frictionless onboarding experience, users only need to submit basic information like government-issued IDs through Web2-style interfaces (eg: mobile apps or websites) We have implemented account abstraction to ensure that users don't have to interact directly with private keys
       - Merchants: A more comprehensive KYC process is in place for merchants, requiring them to provide business registration numbers, tax identification, and proof of their legal jurisdiction. This step ensures that all merchants are verifiable and operating legally
     - Impact**:**
       - Users can trust our platform as all participants are authenticated
       - This reduces fraud and scams in the system as all actors are accountable
       - Makes the platform align with global regulatory standards for financial and commercial transactions

   - **Payment processing:**
     - Objective**:** To create a smooth and cost-efficient payment infrastructure
     - Implementation**:**
       - Payments are processed using stablecoins to minimize volatility and ensure predictability in transactions
       - Spheroid eliminates intermediaries that enable direct transactions between users and merchants

        - The use of smart contracts automates settlements which pimples fund transfers instantly once the conditions are met
    - Impact**:**
        - This drastically reduces transaction fees by bypassing traditional payment processors and banking intermediaries
        - Accelerates settlement times which makes cross-border transactions near instant
        - Improves financial inclusion by allowing anyone with internet access to transact without needing a bank account

- **Merchant Registration**
    - Objective**:** To streamline merchant onboarding while maintaining transparency and accountability.
    - Implementation**:**
        - Merchants can register on the platform via a global registry, providing verifiable business details such as registration certificates and tax documents.
        - Account abstraction allows merchants to interact with the blockchain without needing technical expertise by using web2 style interfaces for ease of use
    - Impact**:**
        - This simplifies the onboarding process, reducing the time and effort required for merchants to start using the platform
        - Ensures that all registered merchants are credible and compliant with the necessary legal requirements
        - Provides confidence to the users to transact with verified merchants only

- **Loyalty programs:**
    - Objective**:** To increase customer retention and engagement through transparent, interoperable loyalty mechanisms
    - Implementation**:**
        - Merchants can set up loyalty programs directly on-chain which allow customers to earn and redeem points or tokens
        - These loyalty rewards are stored in users' wallets, over which users have full control and ownership
        - Interoperability across merchants enables customers to use rewards earned from one merchant with other participating businesses
    - Impact**:**

        - Increases user engagement by offering transparent and easy-to-use rewards programs
        - Builds long-term relationships between merchants and customers
        - Promotes collaboration among merchants by enabling shared loyalty ecosystems

- **Tax and invoice management:**
    - Objective**:** To automate and standardize tax compliance and invoicing processes and reduce administrative burdens
    - Implementation**:**
        - On our platform taxes are calculated in real time based on pre-configured smart contracts, which factor in local tax laws and merchant-specific requirements
        - Invoices are generated automatically and stored on-chain, ensuring that they are immutable and easily accessible for audits
    - Impact**:**
        - Reduces errors associated with manual tax reporting and invoicing
        - Simplifies compliance for merchants and offers the government a greater transparency into taxable transactions
        - Saves time and resources for merchants, allowing them to focus on growing their businesses

- **Unified commerce management:**
    - Objective**:** To provide a centralized platform for managing all commerce-related activities in one place
    - Implementation**:**
        - Users can access a dashboard to view transaction histories, track loyalty rewards, and manage purchases
        - Merchants are also provided with tools to monitor sales, loyalty program participation, and customer behavior in real-time
    - Impact**:**
        - Enhances user convenience by consolidating multiple functionalities into a single platform
        - Offers merchants actionable insights into their operations to help them make data-driven decisions
        - Improves overall user satisfaction by reducing the need for third-party tools and fragmented systems.

- **Financial accessibility:**

- Objective**:** To empower users and merchants with easy access to financing options
- Implementation**:**
  - Onchain credit scoring systems assess users' and merchants' creditworthiness based on their transaction histories and behavioral data
  - Smart contracts enable quick disbursal of loans with predefined terms which eliminates the need for intermediaries.
- Impact**:**
  - Opens up financing opportunities for underbanked and unbanked populations who lack traditional credit histories
  - Provides small businesses with the liquidity needed to expand their operations without going through cumbersome loan approval processes
  - Ensures fairness and transparency in loan disbursements and repayments

4. Geography and Regulation (Mandatory)

Spheroid's geographical focus is based on a combination of mature blockchain markets, emerging economies with growing e-commerce sectors, and regions with favorable regulatory frameworks for blockchain and digital finance

- **Primary focus: United States and European Union (EU):**

  The U.S. and EU markets being the largest digital economy and a home for the thriving blockchain and fintech ecosystem provide a strong foundation for Spheroid's blockchain commerce model. Their advanced blockchain ecosystems, established commerce infrastructure, and high adoption rates of digital payment solutions offer Spheroid an initial growth market

- **Secondary focus: Emerging Markets (eg: Southeast Asia, Latin America)**

  Emerging markets are high-growth regions with increasing demand for e-commerce and blockchain solutions. Southeast Asian, and LATAM countries offer high potential for adoption (recent mass adoption in countries like Thailand, Vietnam, and Argentina serves as an example), particularly with mobile-first users and businesses seeking efficient, low-cost solutions for cross-border transactions, tax automation, and loyalty programs.

Regulatory bodies and their role

The following regulatory bodies oversee blockchain, financial technologies, KYC, and e-commerce compliance in these geographies:

United States

1) **Financial Crimes Enforcement Network (FinCEN):** FinCEN ensures that blockchain platforms comply with Anti-Money Laundering (AML) and Counter-Terrorism Financing (CTF) regulations. This is particularly relevant for Spheroid as it involves financial transactions through stablecoins and the facilitation of payments
2) **Securities and Exchange Commission (SEC):** The SEC oversees the regulatory compliance of tokenized assets and security tokens. Spheroid's platform may need to ensure its token offerings (if applicable) comply with SEC rules regarding securities and their registration
3) **Office of Foreign Assets Control (OFAC):** OFAC ensures that blockchain platforms comply with sanctions regulations, preventing transactions with parties involved in sanctioned activities. It regulates blockchain systems to ensure that no transactions occur with individuals or entities on sanctions lists and platforms to block or reject payments that violate U.S. sanctions
4) **Federal Trade Commission (FTC):** The FTC ensures consumer protection and fair trade in e-commerce, which is critical for Spheroid's blockchain-powered commerce platform

European Union

1) **European Securities and Markets Authority (ESMA):** ESMA oversees financial markets in the EU, including blockchain-based financial instruments such as tokenized assets, digital securities, and blockchain-powered finance. It governs blockchain financial instruments under the **Markets in Financial Instruments Directive (MiFID II)**
2) **European Data Protection Board (EDPB):** The EDPB ensures compliance with the **General Data Protection Regulation (GDPR)**, which regulates how personal data is processed within the EU. This applies directly to Spheroid's handling of KYC data and personal information
3) **European Central Bank (ECB):** The ECB supervises the use of stablecoins in the EU, particularly with their role in financial settlement systems and their potential impact on monetary policy. It ensures the

regulatory safety of stablecoins, which Spheroid uses for payments and settlements

India

1. **Reserve Bank of India (RBI):** The RBI regulates blockchain-based payment systems and stablecoins under the Payment and Settlement Systems Act and oversees digital financial products. It ensures the stability of the payment system by regulating the use of stablecoins and digital currencies for transactions and provides guidelines for KYC/AML compliance in the fintech and blockchain sectors
2. **Securities and Exchange Board of India (SEBI):** SEBI governs securities and tokenized assets in India. If Spheroid issues security tokens or digital bonds, SEBI's regulations would apply. Governs blockchain-related securities and tokenized assets. It regulates how blockchain platforms can offer and trade tokenized securities and oversees Initial Coin Offerings (ICOs) and other digital asset offerings

Global frameworks

1. **Financial Action Task Force (FATF):** FATF provides global guidelines on anti-money laundering (AML) and counter-terrorism financing (CTF) compliance, critical for ensuring blockchain platforms operate within international financial regulations. It establishes the Travel Rule, which requires crypto and blockchain-based fintech services to collect and transmit KYC Data for cross-border transactions

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Regulations that support or restrict Spheroid

Supportive regulations

1. **United States: Travel Rule (FinCEN):** The Travel Rule from FinCEN (Financial Crimes Enforcement Network) requires financial institutions, including blockchain platforms, to collect and transmit specific identifying information for transactions above a certain threshold (typically $3,000). This rule ensures that blockchain platforms adhere to Anti-Money Laundering (AML) and Counter-Terrorism Financing (CTF) standards

Spheroid's platform aligns well with the Travel Rule, as it mandates thorough KYC (Know Your Customer) verification for both merchants and users. This helps to prevent fraud and ensures that both merchants and users are identifiable and accountable. It can integrate the **Travel Rule** into its payment system, ensuring that cross-border transactions involving stablecoins or loyalty tokens meet FinCEN's compliance requirements. This fosters trust and transparency, encouraging the adoption of blockchain commerce systems

2. **European Union: MiCA Regulation:** The Markets in Crypto-Assets (MiCA) regulation is a comprehensive EU framework that governs crypto-assets (including stablecoins), tokenized assets, and blockchain technology. It focuses on creating a safe and transparent environment for the use of crypto-assets while balancing innovation and consumer protection

   MiCA provides clear regulatory guidelines for the issuance and use of **stablecoins**, which is a core feature of Spheroid's platform for payments and settlements. By aligning with MiCA, Spheroid can ensure that its use of stablecoins for transactions and merchant settlements adheres to EU standards for financial services

3. **India: RBI Guidelines for Digital Payments**: The **Reserve Bank of India (RBI)** has set out guidelines for digital payment systems, including the use of blockchain for efficient financial transactions. India is keen on promoting **financial inclusion** and leveraging blockchain for **secure digital payments**, provided these systems comply with RBI's oversight

   Spheroid can leverage blockchain technology for **secure, fast, and cost-effective digital payments**. The RBI's push for the adoption of blockchain-based payment systems provides a supportive regulatory framework for platforms like Spheroid that facilitate transactions using stablecoins and digital wallets. Additionally, **financial inclusion** is a key goal in India, and Spheroid's ability to provide users access to digital wallets, quick loans, and rewards programs could help serve underserved populations, aligning with India's vision for inclusive digital finance

Restrictive regulations

1. United States: SEC Classification of Tokens as Securities:

The **U.S. Securities and Exchange Commission (SEC)** has classified some **tokens** issued by blockchain platforms as **securities**. This means platforms must comply with securities regulations, including registration, disclosure, and reporting requirements if tokens are deemed to be investment assets. Spheroid's **loyalty tokens** issued by merchants could be classified as securities if they are not designed to comply with **SEC** regulations

Loyalty tokens must meet specific criteria, such as whether they provide any profits or ownership rights, to avoid being categorized as investment contracts.If the tokens are considered securities, Spheroid will need to register them with the SEC or ensure they meet exemptions, adding additional legal complexity and potentially affecting the ability of merchants to use them freely

2. European Union: GDPR Compliance (General Data Protection Regulation):

The **General Data Protection Regulation (GDPR)** is the EU's strict privacy and data protection law. It imposes regulations on how businesses collect, store, and manage the **personal data** of EU residents, with an emphasis on transparency, consent, and data minimization

Spheroid's use of **on-chain storage for KYC and transactional data** could face challenges under GDPR, which requires businesses to handle personal data with care. Storing personally identifiable information (PII) on the blockchain, where it is immutable and visible, can create compliance risks around data privacy and user consent. Spheroid must implement **data anonymization**, **user consent mechanisms**, and **data access controls** to ensure compliance with GDPR's strict data privacy requirements. Additionally, the immutability of blockchain data may conflict with the GDPR's **Right to Be Forgotten**

3. India: Cryptocurrency Restrictions*:*

While India has shown interest in adopting blockchain for digital payments, it remains **ambiguous** in its stance on cryptocurrencies. There have been discussions on potential bans or strict regulations for **cryptocurrencies** in the

country, affecting platforms that use cryptocurrencies or stablecoins in their payment systems

The lack of clear regulations on **stablecoins** and **cryptocurrencies** in India could create operational uncertainty for Spheroid. If India enforces a **ban or heavy restrictions** on the use of cryptocurrencies or stablecoins, Spheroid may face limitations in offering its core features in the Indian market. To address these issues, Spheroid would need to closely monitor the regulatory developments in India and adapt its offerings if cryptocurrency restrictions are enforced

5. Technology

Spheroid is an **L2 rollup** based on **Arbitrum Orbit** technology that settles on **Ethereum Mainnet** and ensures high throughput and low latency for commercial transactions. Spheroid will serve as a safe road to bridge the gap between traditional commerce and the blockchain-based commerce system. By default, Spheroid provides KYC, insurance, and AML & fraud monitoring at the core and protocol level and all users are KYC'ed, and the network runs AML on all of them continuously. Transactions can then only be performed by verified participants and are verified through services like **Onfido, Synaps, or Plaid.** Spheroid also has **chain abstraction** at the core and protocol level, and applications can offer easy onboarding and account creation through username-password, 2FA, or mobile device keys. Finally, Spheroid will provide institutions and developers with a **secure SDK ecosystem** to develop upon through which anyone can access all public and liquid protocols on the Ethereum Mainnet safely

Motivation:

- KYC, yet permissionless: Everyone can join the network and doesn't need permission from any single company or individual but with a clear rule at the entrance that participants in the network need to KYC and all the other participants in the network enforce this rule
- Non-custodial: Users retain ownership over their digital assets and data, the protocol and applications built on top must request access to personal data or assets and only the owner of the asset can grant the usage access
- Builtin Insurance: The network also offers **insurance against black swan events** to all the smart contracts and applications built on top of Spheroid. Sequencer fees from the network will be given as a yield to network underwriters for this purpose

Architecture:

1. **Arbitrum Stack:**
   The Arbitrum Orbit stack is the standardized, shared, and open-source development stack that powers Arbitrum. Spheroid settles on Mainnet Ethereum and has a fully compatible EVM but with a modified execution layer that reverts transactions not originating from KYC'ed addresses and collects all sequencer fees (gas) from all the transactions sent to the network. The chain's profit is the spread between all these fees and the cost of settling the batched transactions on Ethereum Mainnet

2. **KYC Architecture**:
   KYC Architecture relies on three components - NFT Smart Contract called SpheroidID, Identity Nodes, and the KYC Providers. Identity Nodes interact with the chain to issue a **soulbond NFT** to users who have completed the KYC process and use different KYC providers to store the user's private information

3. **Native Abstraction:**
   Spheroid integrates complex functionalities such as account management, signature handling, fee abstraction, and interoperability directly at the protocol level and enables the signing of transactions using email, biometrics (FaceID or Passkeys), EVM curve, Solana curve, etc. Spheroid also eliminates the concept of gas fees entirely for the end user and with its unique price abstraction feature, we aim to utilize familiar fiat-denominated pricing, eliminating asset volatility and improving commercial transactions

6. Customer and User Behavior

Spheroid aims to be the backbone of the blockchain-based commerce ecosystem, targeting a diverse range of users

- **Merchants**:
  - Small businesses, e-commerce platforms, local & global sellers, and service providers are seeking to streamline better payments, trust mechanisms, and operational efficiencies
  - Corporations and enterprises that aim to have advanced transparent tax systems, loyalty program management, compliance-ready infrastructure, transparent supply chain payments, and KYC-compliant global operations

- **Consumers**:

    - Frequent online shoppers and tech-savvy buyers who want transparent, secure fast financial transactions and streamlined purchasing experience
    - Consumers making international purchases who seek better exchange rates, faster settlements, and reduced payment friction
    - Loyalty enthusiasts are shoppers who value and actively engage with loyalty programs for rewards, discounts, and exclusive deals
    - Underbanked and unbanked users without access to traditional banking who can use Spheroid wallets to transact seamlessly using stablecoins
    - Financially Conscious Buyers looking to track spending habits, manage rewards, and consolidate all commerce into a single ecosystem

- **Financial institutions**
    - Banks and payment providers offer fiat on-off ramps and stablecoin conversions to merchants and consumers. Institutions or Defi platforms provide micro-loans to merchants and users based on their on-chain credit profiles
    - Accounting and tax firms use automated invoicing and tax data from the blockchain for seamless client reporting

Why users will find value in Spheroid

By integrating legally compliant KYC mechanisms, account abstraction, and on-chain tools, Spheroid ensures that merchants and consumers enjoy trust, transparency, and operational ease.

Merchants:

- **Global trust through KYC**: All merchants boarded into Spheroid must undergo a **KYC registry process**, ensuring verified identities and compliance with regional and global regulations. This registry builds trust among users, as verified merchants are perceived as credible and legitimate

- **Simplified payments & settlements**: Spheroid supports **instant stablecoin settlements**, eliminating delays caused by banking intermediaries. Transaction fees are kept minimal (**1%-1.5%**) compared to credit card fees (**2%-5%**), saving merchants significant costs

- **Quantified savings**: A medium-sized business with $1M annual revenue can save between **$10,000 and $40,000 annually** in transaction fees

- **On-chain loyalty programs**: Merchants can design and issue **customizable loyalty tokens** on-chain to reward repeat customers. These tokens can be tailored to specific promotions, ensuring engagement and retention
    - **Impact**: Retention rates for loyal customers can improve by **15%-20%**

- **Automated tax compliance & invoicing**: Taxes and invoices are **automatically calculated, filed, and stored on the blockchain** for seamless auditing and compliance and this automation reduces accounting overhead and improves transparency for regulatory bodies

- **Access to Financing**: Spheroid enables **quick loans for merchants**, utilizing their transaction history as collateral through smart contracts and this facilitates liquidity without relying on traditional banks or long approval processes

Consumers

- **Ease of Use**: Wallet creation is **simplified with web2 login methods** and **KYC integration**, hiding the complexities of blockchain and users do not need to manage **seed phrases**, instead, **2FA-secured logins** are used, enhancing security and convenience

- **Transparent commerce**: Every transaction, invoice, and loyalty reward is stored **immutably on-chain**, providing users with complete transparency and control

- **Integrated platform**: Users can manage **all commerce-related activity and rewards** through a unified platform (Spheroid Client), eliminating the need for multiple apps

- **Faster payments and refunds**: **Instant stablecoin payments** ensure no delays in purchases or refunds, avoiding the usual waiting period associated with traditional banks

- **Access to loans**: Consumers with a strong transaction history on Spheroid can unlock **microloans** or **buy now pay later options**, enabling financial flexibility

Who will pay for Spheroid services?

1. **Merchants**: As primary beneficiaries of Spheroid's services, merchants pay for KYC registration, transaction processing, loyalty program management, and optional tax automation tools

2. **Consumers**: Basic wallet use and transactions are **free using the native gas abstraction feature**, but users pay nominal fees for premium services like **micro loans** or financial management tools

3. **Third Parties**: Financial institutions, loan providers, and analytics firms will pay for **access to anonymized data** and APIs (with user consent)

Pricing structure for Spheroid services

Merchant fees

- **Registration fee**: one-time fee (depending on country and zone) for **KYC processing** and onboarding to the global merchant registry

- **Transaction fee**: **1%-1.5% per transaction**, significantly lower than traditional payment processors

- **Loyalty program management**: monthly fee (depending on country and zone) for basic **on-chain loyalty token** creation and management

- **(Optional) Tax & Invoicing tools**: (charges independent of country and zone)
    - **$20/month standard**: Basic tax compliance features
    - **$50/month standard**: Advanced features like detailed reporting and integration with accounting software

Consumer fees

1. **Basic**: Free for all users to store, transact, and manage rewards
2. **Premium services**:
    - **Microloans**: ~2%-5% interest per loan, depending on user risk profile
    - **BNPL services**: ~0%-5% interest, depending on user risk profile

Key differentiators of Spheroid

- **KYC and compliance-ready**: Spheroid ensures all users and merchants undergo KYC, providing a legally compliant and globally trusted ecosystem

- **Chain abstraction:** Merchants and users enjoy a web2-like experience with seamless wallet creation, abstracting the technical complexity of blockchain

- **Ecosystem efficiency:** The platform combines essential tools like on-chain loyalty programs, instant stablecoin settlements, and automated tax systems, providing unparalleled convenience, trust, and cost savings

- **Scam prevention:** The KYC registry prevents fraudulent activities, safeguarding users and merchants from scams and non-legitimate entities, and unnecessary chargebacks

7. Market and Strategic Analysis

Market Overview

Blockchain technology continues to revolutionize various sectors, with the commerce industry benefiting significantly from its capabilities. The global blockchain market, valued at over $10 billion in 2023, is expected to grow at a CAGR of 45.3%, reaching around $160 billion by 2034. This expansion is driven by the increasing need for secure, transparent, and efficient systems in business transactions, a problem Spheroid aims to solve

As blockchain technology becomes more mainstream, the demand for decentralized solutions surges, especially in sectors like finance, supply chain, and healthcare. In particular, blockchain's potential to remove middlemen, reduce fraud, and enhance transparency is attracting significant interest from commercial entities

The sector for blockchain in commerce is set to see considerable growth. Businesses are increasingly adopting blockchain to enhance their payment systems, loyalty programs, and customer relations, while consumers are drawn to the potential of reduced transaction costs and faster settlements. As Spheroid focuses on Arbitrum Orbit-based L2 solutions, its alignment with the growing demand for scalable, cost-effective, and secure blockchain solutions places it in an ideal position within this expanding market

Competitive Landscape

The blockchain market for commerce is becoming highly competitive, with several large players developing similar technologies. Companies like IBM and Microsoft are already investing heavily in blockchain solutions for business applications. However, many of these solutions often struggle with scalability and user experience, which presents an opportunity for new players like Spheroid to differentiate themselves

While traditional blockchain solutions focus primarily on large-scale cryptocurrencies and enterprise systems, Spheroid's focus is on a more specialized layer 2 solution for commerce. The scalability and low transaction costs make it a strong contender in an industry plagued by high gas fees and slow transaction speeds, particularly for smaller and medium-sized businesses

Market Needs and Challenges

- **Security and fraud prevention:** The rise of scams, hacks, and rug pulls in blockchain technology has significantly affected user trust. In 2024, over $30 billion was lost due to blockchain-related scams. Spheroid addresses these issues directly with its focus on security, ensuring that both merchants and consumers can engage in transactions without fear of fraud

- **User experience and Accessibility**: The complexity of managing private keys and securing funds in current blockchain systems is a major barrier to mainstream adoption. Spheroid's platform aims to simplify this by offering a user-friendly interface, allowing individuals and businesses to enjoy the benefits of blockchain without needing deep technical expertise

- **Regulatory concerns**: Regulatory frameworks surrounding blockchain and cryptocurrencies are still evolving globally. While some regions have introduced favorable regulations, others remain uncertain, creating a level of risk for blockchain-based startups. However, the trend of increased governmental support for blockchain initiatives (such as the European Union's Digital Finance Package) signals a positive shift

Target market and audience

Spheroid's target market includes both merchants and consumers who seek faster, more secure, and cost-effective transaction systems. This includes:

- **Small and medium enterprises (SMEs):** With a growing focus on decentralization and lower operational costs, SMEs are looking to blockchain to enhance their transaction and payment processes and accept cross-border payments

- **Consumers seeking transparency and Security:** As consumer demand for transparency grows, individuals are seeking more secure and efficient ways to engage with merchants, which blockchain solutions like Spheroid can provide

The market opportunity in the blockchain commerce space is vast. By tapping into this demand for improved security, transparency, and user experience, Spheroid is positioned to meet the needs of both small merchants and large enterprises alike

Strategic recommendations

- **Focus on partnerships:** To accelerate adoption, Spheroid should seek strategic partnerships with established players in the blockchain space and within industries like retail, finance, and healthcare. Partnering with companies that already have established consumer bases can provide faster access to market penetration
- **Incentives for early adoption:** Offer incentives such as reduced fees, bonus loyalty points, and exclusive access to tools and features for early adopters and implement referral incentives where existing users can earn rewards for bringing new merchants and consumers onto the platform (0.01% of all the transaction fee generated by the user/merchant for next 1 year)

- **Building trust:** Transparency and trust are crucial in blockchain adoption. Spheroid should invest in education and awareness campaigns to address the skepticism surrounding blockchain technologies, especially focusing on its security features and user-friendly interface

- **Expand geographically:** As blockchain adoption grows globally, expanding Spheroid's offerings to international markets, particularly in Asia and Europe, will provide access to the fastest-growing sectors in blockchain technology

Existing competitors with similar offerings

- **BitPay:** BitPay is a leading cryptocurrency payment processor that allows merchants to accept various cryptocurrencies as payment, while BitPay focuses on facilitating cryptocurrency payments, Spheroid is a standalone L2 that offers additional features such as walletless user experiences, automated taxation, and integrated loyalty program

- **Coinbase Commerce:** Coinbase Commerce enables merchants to accept multiple cryptocurrencies directly into a user-controlled wallet, simplifying the payment process, while it is part of coinbase ecosystem, providing additional services like trading and custodial wallets, Spheroid focuses exclusively on commerce functionalities

- **Shopify's crypto integration**: Shopify allows merchants to integrate cryptocurrency payment options, enabling customers to pay with digital currencies. While Shopify's integration is an add-on to its established e-commerce platform, Spheroid offers a dedicated blockchain infrastructure tailored for commerce with additional features like KYC, loyalty programs, and dispute resolution which are handled in a centralized manner with Shopify

Porter analysis for the current market

Porter's five forces model is a strategic framework to assess the competitive environment of an industry. For Spheroid, understanding these forces is crucial to developing strategies that enhance competitiveness.

Here's a detailed Porter analysis:

1. Threat of new entrants

The threat of new entrants in the blockchain and commerce space is moderate to high. Key factors influencing this include:

- **Low barriers to entry in blockchain development:** Open-source frameworks make it relatively easy for new developers to enter the market. However, building a robust, scalable solution like Spheroid requires significant investment in R&D

- **Regulatory challenges:** While barriers to entry are low technically, navigating global regulatory frameworks for blockchain adoption creates complexity for new entrants

- **Brand loyalty and trust:** Established players with proven security and reliability (like Spheroid's focus on reducing fraud and simplifying UX) act as a deterrent to new competitors

Strategic insight: To mitigate this threat, Spheroid can invest in brand building and establishing thought leadership in the blockchain for commerce niche

2. Bargaining power of suppliers

In blockchain solutions, suppliers include developers, blockchain infrastructure providers, and cloud hosting services. The bargaining power of these suppliers is moderate:

- **Technical expertise is key:** Skilled developers with blockchain expertise are in high demand, giving them significant bargaining power

- **Infrastructure costs:** Cloud hosting and layer 2 technologies like Arbitrum are pivotal. Spheroid's use of scalable and cost-efficient solutions helps reduce dependency on high-cost suppliers

- **Evolving technology:** Rapid changes in blockchain technology require continuous learning and adaptation, increasing reliance on emerging suppliers

Strategic insight: Building an in-house technical team and building partnerships with infrastructure providers can reduce supplier power

3. Bargaining power of buyers

The bargaining power of buyers in the blockchain for commerce market is **high**, driven by:

- **Wide range of alternatives**: Competitors like IBM Blockchain, Ripple and other layer 2 solutions offer varied features

- **Cost sensitivity**: Merchants and consumers in commerce seek cost-effective, user-friendly solutions

- **Demand for transparency**: Buyers value platforms with high transparency and low risk of fraud, aligning well with Spheroid's value proposition

Strategic insight: Differentiating through unique features like enhanced security, simplified UX, and loyalty programs can reduce buyer power.

4. Threat of substitutes

The threat of substitutes is **moderate to high**, depending on:

- **Traditional payment systems**: Established payment solutions (eg: PayPal, Stripe) provide convenience and familiarity, posing a significant threat

- **Emerging blockchain alternatives**: Other decentralized platforms/protocols offer similar functionalities

- **Scalability and cost factors**: Many substitutes struggle with issues like high fees or slow transaction speeds, areas where Spheroid excels

Strategic insight: Focus on education about the unique advantages of blockchain solutions, such as fraud prevention and transparency, which can limit substitution risks

5. Industry rivalry

The level of competition in the blockchain space is **intense**:

- **Niche focus**: Spheroid's niche focus on commerce and Arbitrum Orbit provides a competitive edge, reducing direct rivalry with generalized blockchain solutions

- **Innovation Race**: Constant innovation in smart contracts, security features, and UX adds to the competitive pressure

Strategic insight: Continuous innovation and focusing on underserved areas within commerce, such as dispute resolution and instant payments, can reduce the intensity of rivalry

Porter's five forces analysis demonstrates a mixed competitive environment for Spheroid, with opportunities to differentiate through innovation, targeted marketing, and strategic partnerships. By focusing on its core strengths of security, user experience, and commerce-specific applications; Spheroid can effectively navigate the competitive landscape and establish a strong foothold in the blockchain for commerce market

Forecasted Porter analysis for two years from now

1. Competitive rivalry (High)

- **Current state:** The blockchain industry is already competitive, with large players like IBM, Microsoft, and Ethereum layer 2 solutions dominating. Smaller players are also targeting niche markets

- **Forecasted changes:**
    - Increased adoption of blockchain technology in commerce will attract more competitors
    - Existing competitors may enhance their offerings to include commerce-specific features, increasing rivalry
    - Spheroid's differentiation in user-friendly design, security, and cost-efficiency could mitigate competitive pressures

Mitigation strategy: Focus on partnerships with e-commerce platforms and continuous innovation to maintain competitive advantage

2. Threat of new entrants (Moderate)

- **Current state:** Barriers to entry in the blockchain industry are significant due to the need for technical expertise, regulatory compliance, and substantial initial investment

- **Forecasted changes:**
    - Advancements in blockchain tools and frameworks could lower the technical barrier, making it easier for new entrants to develop competitive solutions
    - However, Spheroid's early market penetration and partnerships could provide a strong first-mover advantage

Mitigation strategy: Build a loyal user base through superior customer support, loyalty programs, and educational initiatives to establish brand equity.

3. Threat of substitutes (Moderate to High)

- **Current state:** Substitutes include traditional payment systems (eg: credit cards, PayPal) and other blockchain platforms with commerce capabilities

- **Forecasted changes:**
    - Traditional systems may integrate blockchain-like features (eg: instant settlements and lower fees) to compete
    - Defi platforms and emerging layer 2 solutions could act as close substitutes

Mitigation strategy: Highlight Spheroid's unique selling points such as dispute resolution, instant payments, and loyalty program integration to maintain a competitive edge

4. Bargaining power of suppliers (Low)

- **Current state**: Spheroid depends on Arbitrum Orbit for its infrastructure, which is a specialized solution but not easily replaceable

- **Forecasted Changes:**
    - As blockchain ecosystems grow, alternative L2 infrastructures may become available, reducing supplier power
    - Improved interoperability between blockchains could also give Spheroid more flexibility in choosing technology partners

Mitigation strategy: Negotiate long-term agreements with infrastructure providers and diversify technology partnerships to reduce dependency

5. Bargaining power of buyers (Moderate to High)

- **Current state:** Buyers include both merchants and consumers who have numerous options for payment and commerce platforms.
- **Forecasted changes:**
    - As Spheroid grows, buyers may demand lower fees, better incentives, and improved service levels due to increased competition
    - Buyers' power will be higher if they perceive limited differentiation between Spheroid and competitors

Mitigation strategy: Continuously enhance product features based on user feedback and provide exclusive benefits (eg: reduced fees for early adopters and loyalty rewards)

Key takeaways for two years from now:

- **Spheroid's position:** Spheroid can secure a strong position by leveraging its unique value propositions (security, user experience, scalability) and forming strategic partnerships

- **Challenges:** Competition and substitutes will intensify as the blockchain commerce market matures, requiring constant innovation and customer engagement

- **Opportunities:** Early adoption of scalable blockchain solutions and targeted marketing could solidify Spheroid as a leader in decentralized commerce

Market share analysis

Current market share: Spheroid is entering a highly competitive blockchain for the commerce market. Based on industry estimates:

- Blockchain-based payment solutions accounted for $9 billion globally in 2023
- layer 2 solutions like Arbitrum are growing by over 35% CAGR, showcasing a robust demand for scalable blockchain platforms

Forecasted market share (two years)
Spheroid is projected to capture a 9-12% share of the blockchain for commerce market, driven by:

1. **Niche targeting:** Commerce-specific solutions like loyalty programs and dispute resolution give Spheroid a competitive advantage

2. **User-friendly features:** Addressing the cryptographic complexity barrier will attract non-technical users

3. **Market size growth:** The blockchain commerce market is expected to reach over $50 billion by 2026, and Spheroid's could secure a strong foothold

Competitive benchmarks
Competitors may retain larger shares, but Spheroid's specialized offerings can carve out a loyal customer base within commerce

Strategies to increase market share:

- Aggressive marketing to onboard merchants and consumers

- Expanding partnerships with e-commerce platforms
- Continuous feature enhancement to stay ahead of industry trends

Funding breakdown

1. Technology development (40% - 50%)

- **Platform development:**
    - Building the Arbitrum-based L2 rollup, integrating KYC, AML, insurance functionality, and chain abstraction features
    - **Estimated cost: $1,000,000 - $1,500,000**

- **Smart contract development:**
    - Developing secure smart contracts for identity verification (SpheroidID), loyalty programs, and automated tax systems
    - **Estimated cost: $400,000 - $600,000**

- **SDK ecosystem:**
    - Creating an SDK for developers and institutions to integrate with the Ethereum Mainnet
    - **Estimated cost: $200,000 - $300,000**

Total technology development funding: $1,600,000 - $2,400,000

2. Legal and Compliance (15% - 20%)

- **Regulatory compliance:**
    - Ensuring the platform complies with global regulations (eg: GDPR, KYC/AML compliance)
    - **Estimated Cost: $300,000 - $400,000**

- **KYC provider partnerships:**
    - Partnerships and integrations with Onfido, Synaps and Plaid
    - **Estimated Cost: $100,000 - $200,000**

- **Insurance partnerships for black swan events:**
    - Underwriting and insurance for smart contracts and transactions

- **Estimated Cost: $150,000 - $250,000**

Total legal and compliance funding: $550,000 - $850,000

3. Marketing and Customer acquisition (15% - 20%)

- **Branding, advertising, and outreach:**
  - Includes digital marketing, campaigns, and website creation
  - **Estimated Cost: $300,000 - $400,000**

- **Partnership development:**
  - Outreach to merchants and financial institutions for early adoption
  - **Estimated Cost: $100,000 - $150,000**

Total marketing and customer acquisition funding: $400,000 - $550,000

4. Infrastructure and operational costs (10% - 15%)

- **Server and cloud services:**
  - Cost of decentralized hosting, transaction processing, and cloud infrastructure
  - **Estimated Cost: $150,000 - $250,000**

- **Backend infrastructure:**
  - Payment gateways, data storage, and network security
  - **Estimated Cost: $100,000 - $150,000**

Total infrastructure and operational costs funding: $250,000 - $400,000

5. Legal and Insurance coverage (5%-10%)

- **Underwriting for black swan events:**
  - Funding for insurance to handle unexpected, catastrophic events
  - **Estimated Cost: $100,000 - $150,000**

- **Regulatory approval fees:**
    - Fees for setting up legal frameworks, certifications, and regulatory compliance
    - **Estimated Cost: $50,000 - $100,000**

Total legal and insurance coverage funding: $150,000 - $250,000

Total estimated funding needed:

- **Lower end estimate: $3,000,000**
- **Upper end estimate: $4,550,000**

Funding allocation per stage

Phase 1: Core development (6 - 9 months)

- Focus: Platform development, KYC/AML integration, initial partnerships and beta testing
- **Estimated Funding Requirement: $1,500,000 - $2,000,000**

Phase 2: Expanded testing & integration (3 - 4 months)

- Focus: Expanded beta with additional merchants, integration of loyalty programs, tax automation, and stablecoin payments
- **Estimated funding requirement: $1,000,000 - $1,500,000**

Phase 3: Full launch (1 - 2 months)

- Focus: Platform launch to the broader market, marketing campaigns, and ongoing optimizations
- **Estimated funding requirement: $500,000 - $1,000,000**

Total timeline for launch:

- **12 - 16 months** for full platform launch

Appendix A: References

- **Arbitrum**: Arbitrum orbit. Retrieved from https://arbitrum.io/
- **Kinto.xyz**: *Kinto: Simplifying KYC*. Retrieved from https://kinto.xyz/
- **Coinbase Commerce**: *About Coinbase Commerce*. Retrieved from https://commerce.coinbase.com/
- **Educhain**: *Educhain: Blockchain for Education*. Retrieved from https://educhain.xyz
- **CryptoRank**. (n.d.). *Educhain Funding Overview*. Retrieved from https://cryptorank.io/ico/open-campus
- **IRS:** *Virtual Currencies*. Retrieved from https://www.irs.gov/businesses/small-businesses-self-employed/virtual-currencies

Appendix B: ChatGPT Usage

Overview of prompts:

- We requested a breakdown of the value chain for this solution, detailing the stages involved and identifying where the startup would fit within the ecosystem
- The next step involved expanding on the existing pain points in the traditional commerce value chain. This included asking for insights into inefficiencies like high transaction costs, fragmented identity verification, and lack of financial accessibility
- Finally, We prompted the system to identify specific steps in the value chain that the blockchain startup would address or disrupt, along with detailed explanations of how the solution would improve or replace traditional processes

Chat links:
https://chatgpt.com/share/675b2b8c-31d0-8006-9604-d700a9ffbfb4