The AiFi Thesis

Peri Labs (Periphery) and GAIB

Abstract

AiFi (Artificial Intelligence Finance) bridges AI technologies and decentralized finance by transforming key AI resources—such as compute, data, models, and autonomous agents—into tokenized, tradable assets. This paradigm enables investors, corporations, and institutions to gain fractional ownership or direct exposure to AI's growth potential, while fostering deeper liquidity, transparency, and automation across global markets. Building on three distinct market-sizing frameworks (TAM–SAM–SOM, Value-Chain Segmentation, and Adoption Curves), this paper estimates substantial value in tokenized AI infrastructure, data, and services. We explore how recent advances in blockchain scalability, cryptographic proofs, and institutional acceptance of digital assets have made AiFi both viable and attractive. However, technical complexities—ranging from privacy-preserving AI computations to interoperability—and regulatory uncertainties continue to pose serious challenges. We also discuss core development areas such as agentic finance (AgentFi), novel RWA tokenization techniques, and emerging business models for AI-backed financial products. Despite these hurdles, AiFi stands at the forefront of a new era in which AI's capabilities and economic value can be more broadly accessed, financed, and governed. Unlocking AiFi's full potential requires overcoming existing limitations in market liquidity, user adoption, and regulatory clarity. Yet, success in this endeavor could reshape the AI sector and accelerate its integration into mainstream finance, sparking a wave of innovation and democratizing participation in the next evolution of the AI economy.

Keywords: *AiFi, tokenized AI, decentralized finance, blockchain, AI agents, AI infrastructure, data tokenization, model tokenization.*

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This report is the culmination of efforts from not just the teams at Peri Labs and GAIB, but also each of the individuals who helped shape our thesis, highlighting the role of AiFi in crypto.

A Note from the Authors

We, the teams at **Periphery (Peri Labs)** and **GAIB**, offer this report as a concise look at the convergence of AI and decentralized finance. Over the past year, we have seen AI assets—compute, data, advanced models, and multi-agent frameworks—evolve into open, investable instruments, giving rise to a new paradigm: *AiFi*.

In this report, we distill our joint findings on compute tokenization and yield generation, underutilized hardware aggregation, and agentic finance (AgentFi). While the field remains nascent, demand for AI capacity is accelerating in real time.

Our intention is twofold:

1. Illustrate how AI, tokenization, and decentralized infrastructure overlap to deliver tangible value for investors, device owners, and data centers.

2. Highlight longer-term possibilities, from robust multi-agent coordination networks to large-scale data and model marketplaces.

From **Periphery**'s dynamic orchestration layer to **GAIB**'s innovative economic layer, we envision an ecosystem fostering inclusive growth, liquidity, and resilience in AI-driven technologies. While regulatory, technical, and educational challenges persist, we hope these examples and insights inspire you to shape this evolving *AiFi* landscape.

We do not pretend to have all the answers. As with any frontier, new risks will emerge, and the contours of AiFi will continue to evolve. Yet our hope is that by sharing concrete use cases, honest assessments of challenges, and a forward-looking vision, you will feel inspired to take part in building and refining this new domain. Whether you are a researcher, an investor, an entrepreneur, or a curious newcomer, we invite you to engage and shape the next phase of *AiFi* with us.

Periphery (Peri Labs) and GAIB

28 February 2025

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Chapter 1

The Rise of AiFi

1.1. Definition of AiFi

AiFi

AiFi (Artificial Intelligence Finance, pronounced "A-I-fye") brings AI assets—such as GPUs, models, data, and IP—on-chain by leveraging composable, decentralized infrastructure (e.g., DeFi). By tokenizing these underutilized resources into tradable digital commodities, AiFi unlocks liquidity, broadens investor access, and opens new financing pathways—ultimately catalyzing capital flows and innovation across the AI ecosystem.

How AiFi differs from DeFAI/DeAI. Unlike DeFAI—which integrates AI into DeFi (e.g., using AI agents for portfolio management, trading, or user interface abstraction)—AiFi focuses on the *financialization* of AI resources themselves. In other words, while DeFAI typically employs AI to enhance DeFi applications, AiFi centers on tokenizing the underlying AI assets and infrastructure, turning them into liquid, investable commodities.

1.2. The Thesis: Every Layer of AI Financialized

We believe every layer of the AI stack—hardware, data, models, and agents—will be financialized. Today, dominant "god-models" monetize via closed-source, pay-per-API frame-

works, limiting both market competition and broad investor access. AiFi disrupts this dynamic by bringing AI components onchain, enabling open-source initiatives to secure funding, reward contributors, and compete with established players. This financialization meets the sector's massive capital needs (e.g., multi-billion-dollar GPU data centers, large language models) while amplifying innovation and democratizing AI ownership.

1.3. Why AiFi Matters

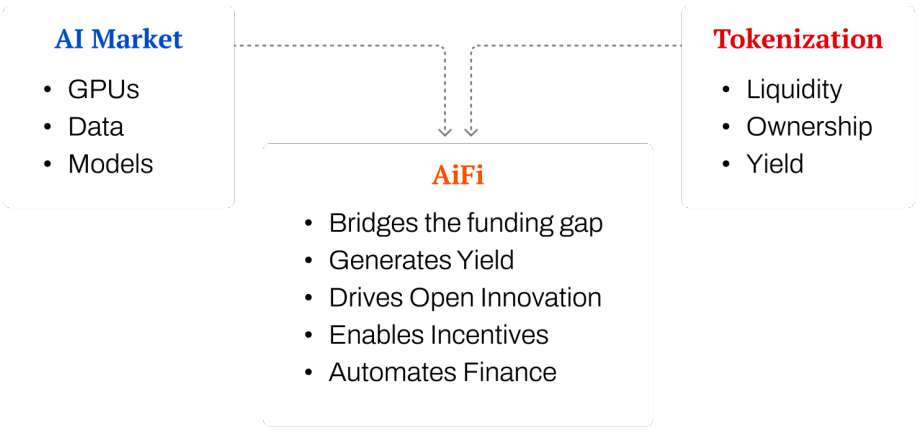


Figure 1.1: Foundations of AiFi: bridging AI resources with decentralized finance.

- **Bridging the Funding Gap.** In 2024 alone, global VC funding for AI reached $131.5bn, a 52% increase year-on-year—even as broader start-up funding dipped. Yet, building advanced AI systems demands colossal capital injections, highlighted by Databricks' $10bn round. AiFi broadens investor participation via tradable tokens and onchain markets, allowing more players to finance and benefit from AI's growth.

- **Generating Yield.** Staking or locking tokenized AI assets (e.g., GPU capacity, model-access rights) in DeFi protocols yields passive returns from real-world usage—such as compute rentals or licensing fees. Similar to "restaking" in crypto,

AiFi's yield mechanisms tap into genuine market demand, aligning incentives for both investors and AI developers.

- **Driving Open Innovation.** By tokenizing spare capacity (inspired by Keynes's "spare capacity" concept), AiFi unleashes dormant AI assets and fosters a more equitable AI landscape. Open-source model creators, data providers, and emerging AI projects can secure funding and share rewards transparently—without relying on large, closed-source platforms.

- **Enabling Permissionless Incentives.** AiFi's infrastructure empowers any contributor—from individual hobbyists to global enterprises—to tokenize and monetize their AI resources, all through a trustless, decentralized mechanism. This permissionless environment expands access, reduces reliance on centralized gatekeepers, and accelerates AI-driven innovation by ensuring participants are directly rewarded for their contributions.

- **Automating Finance.** AI-driven agents can actively manage liquidity and risk for tokenized AI assets in DeFi, optimizing yield strategies and trading decisions. This agent-to-agent economy promises heightened efficiency and self-sustaining growth, as AI bots transact with one another for compute, data, or specialized services.

- **Enabling Market Efficiency.** Financialization of any asset promotes efficient and transparent markets through the introduction of central limit orderbooks, trading, and more. This process brings more accessibility in an otherwise opaque market.

1.4. Core Components of AiFi

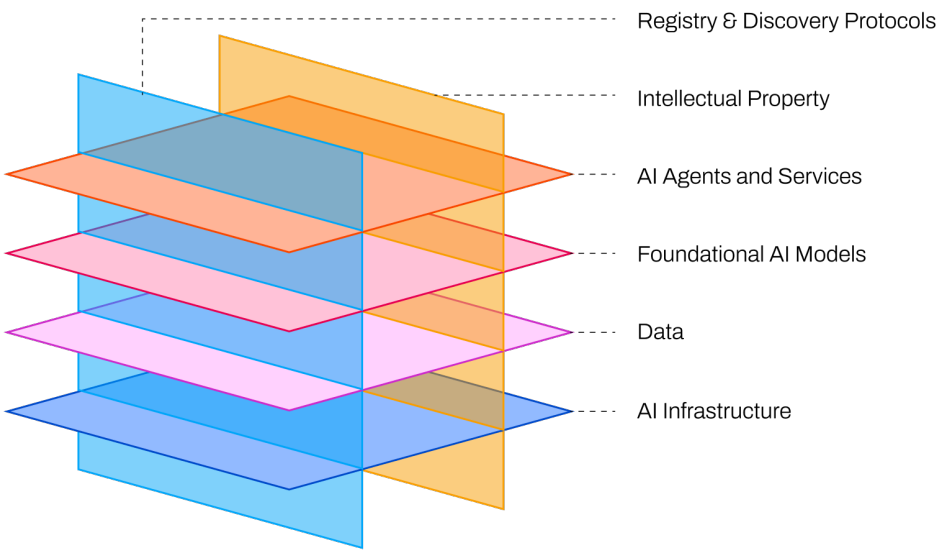


Figure 1.2: Core Components of AiFi

1.4.1 AI Infrastructure (Hardware + Cloud)

What It Is: The fundamental resources required for AI training and deployment—e.g., GPUs, TPUs, HPC clusters, and cloud computing services.

How AiFi can support it: By fractionalizing spare or industrial-grade hardware into tradable tokens, owners can lease out unused capacity to AI developers. These tokenized assets can also be staked or used as collateral in DeFi, enabling passive income for owners and flexible access for AI builders.

1.4.2 Data

What It Is: The core input for AI training and inference—structured and unstructured datasets, often curated or specialized for machine learning tasks.

How AiFi can support it: Tokenizing datasets allows producers to monetize their contributions and set custom licensing terms. AI developers can then purchase or license

tokenized data via onchain marketplaces, ensuring transparent provenance, revenue splits, and usage rights.

1.4.3 Foundational AI Models

What It Is: Large-scale, pre-trained AI architectures (e.g., GPT-based models) serving as a basis for a wide range of downstream applications.

How AiFi can support it: By tokenizing access rights—whether through licensing, subscriptions, or usage credits—AiFi enables these models to generate recurring revenue. Investors gain direct exposure to the growth potential of cutting-edge AI, while developers secure funding for further R&D.

1.4.4 Intellectual Property (IP)

What It Is: The intangible "blueprints" behind AI—including algorithms, patents, proprietary ML techniques, and AI-generated outputs or refined models. IP can be both input (e.g., training methods, data-processing code) and output (e.g., improved architectures, new features).

How AiFi can support it: AiFi licenses or securitizes these IP assets via tokens/NFTs, creating a secondary market for intangible AI value. This approach lowers barriers for developers needing capital, while giving investors exposure to future revenue streams—from licensing fees to royalties on AI-generated innovations.

1.4.5 AI Agents & Services

What It Is: Intelligent agents or AI-driven applications that leverage tokenized compute, data, models, and IP to deliver specialized services—ranging from automated trading to real-time analytics.

How AiFi can support it: These agents transact autonomously onchain, negotiating resources, staking tokens, and executing strategies in DeFi. Over time, agent-to-agent economies can form, where AI bots exchange compute, data, and services, driving self-sustaining ecosystems and accelerating AI-driven innovation.

1.4.6 Registry & Discovery Protocols

What It Is: A unified interface or protocol layer that indexes and lists all tokenized AI assets—compute capacity, datasets, models, IP, and services—and facilitates discovery across multiple networks or platforms.

How AiFi can support it: AiFi can host a registry where providers list their tokenized resources, along with usage terms and redemption details. Developers and AI agents can search or query this registry to find pluggable components—for example, spare GPU tokens or specialized datasets—to integrate into their pipelines. Registry mechanisms may include onchain reviews, user ratings, or trust scores, ensuring that tokenized assets meet certain quality or performance criteria before buyers engage.

1.5. Ensuring Custody & Redeemability

Tokenizing real-world AI resources—such as physical GPUs, specialized data sets, or proprietary models—presents a critical challenge: how to guarantee that on-chain tokens truly reflect redeemable rights to these off-chain assets. Without a clear mechanism to bridge the physical and digital realms, token holders risk owning assets with no enforceable claim to the underlying resource. AiFi addresses this by focusing on:

▷ **Physical Custody & Maintenance.**

Hardware (GPUs/TPUs): Typically housed in secure data centers or managed by specialized operators. Tokens represent usage rights or fractional ownership of compute time, which holders can redeem to run AI workloads.

Data & Models: Stored in decentralized storage networks (e.g., IPFS, Filecoin) or trusted enterprise repositories with verifiable integrity checks. Token holders receive cryptographic keys or unique access codes to use or license the dataset/model.

▷ **Enforceable Redeemability.**

Redemption Protocols: Smart contracts define how token holders can exchange tokens for compute cycles or data access. Upon redemption, the custodian (or

automated system) grants the holder's AI job priority queue access or unlocks the relevant dataset.

Oracles & Trust Models: AiFi projects need to rely on oracles to confirm off-chain events—such as GPU uptime, data retrieval, or model usage— and update on-chain records accordingly. Where centralized custody is required, legal frameworks (e.g., service-level agreements) outline the custodian's obligations to token holders.

▷ **Value & Liquidity.**

Market Confidence: The more transparent and verifiable the custody process, the higher the market confidence in the token's underlying value.

Secondary Markets: With verifiable redemption mechanisms, token holders can confidently trade AI asset tokens on secondary markets, knowing each token is backed by actual GPU capacity, data rights, or model access.

1.6. Pathways to Scale

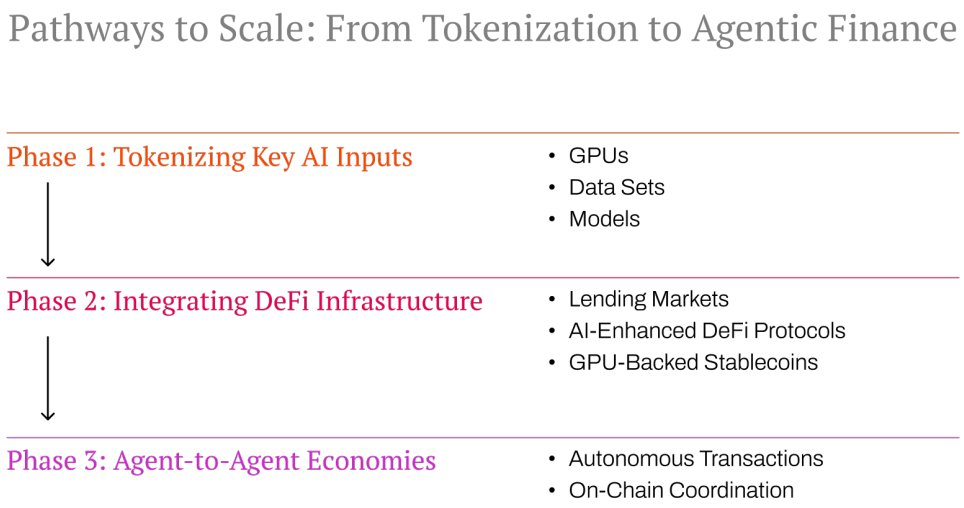


Figure 1.3: Pathways to Scale.

▷ **Phase 1: Tokenizing Key AI Inputs.** By fractionalizing high-value AI assets—such as GPU capacity or large-scale datasets—smaller investors and institutions alike can participate in opportunities formerly reserved for big tech. This expanded access fuels innovation, lowers barriers to entry, and enriches the overall AiFi ecosystem.

▷ **Phase 2: Integrating DeFi Infrastructure.** Once key AI assets—such as tokenized GPUs or data—are established, they can be deployed within DeFi for lending, collateralization, derivatives, and more. This approach harnesses DeFi's composability to create new financial products (e.g., GPU-backed stablecoins), broaden market reach, and lay robust infrastructure for AiFi's growth. Simultaneously, AI can also improve DeFi itself: by powering automated liquidity management, risk assessment, and predictive analytics, AI-enhanced DeFi protocols can operate more efficiently. In effect, AiFi unifies these two paths—using DeFi to financialize AI assets while leveraging AI capabilities to optimize existing DeFi mechanisms.

▷ **Phase 3: Agent-to-Agent Economies.** Fully developed AiFi platforms will feature autonomous AI agents that manage, stake, and trade tokenized assets, eventually leading to agent-to-agent economies. In these environments, AI bots transact with one another for compute, data, and specialized services—amplifying both efficiency and innovation.

1.7. Pathways to Scale: From Tokenization to Agentic Finance

Phase 1: Tokenizing Key AI Inputs Projects begin by fractionalizing high-value assets such as GPUs or large datasets, providing broader investment access and liquidity.

Phase 2: Integrating DeFi Infrastructure These new tokens get listed on decentralized exchanges, can be used as collateral in lending protocols, or serve as the basis for derivatives and structured products.

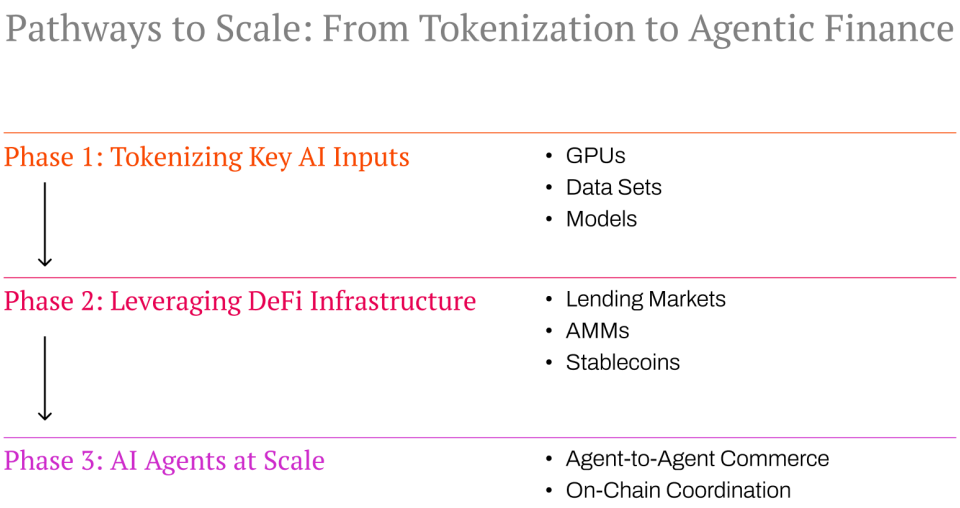


Figure 1.4: Roadmap for AiFi evolution, from basic tokenization to full agent-based finance.

Phase 3: AI Agents at Scale Mature AiFi systems feature autonomous agents that manage, trade, or stake these AI assets, potentially spawning full "agent-to-agent" economies where AI bots pay each other for compute, data, or other resources.

1.8. Evaluating AiFi Projects

When assessing any AiFi initiative, consider:

▷ **Identify the Target Pillar(s).**

- **What to Look For:** Determine which layer(s) the project addresses—compute, data, models, or agents.
- **How to Verify:** Review the whitepaper and technical documentation to see how each pillar is monetized or tokenized. Check if partnerships or onchain data confirm actual usage of those specific AI resources.

▷ **Assess AI vs. DeFi Integration.**

- **What to Look For:** Is the project monetizing AI assets (e.g., tokenizing GPUs or models) or using AI to enhance DeFi (e.g., autonomous liquidity management)—or both?
- **How to Verify:** Examine case studies, demos, or audits to confirm real implementation of AI features (like predictive analytics) and DeFi features (like lending pools or AMMs).

▷ **Check Real-World Utility.**

- **What to Look For:** Tokenized resources should be tied to actual AI workloads or verifiable licensing revenue (in the case of model tokens).
- **How to Verify:** Seek evidence such as onchain analytics (e.g., usage volume for GPUs), existing customer testimonials, or revenue-sharing smart contracts that detail how funds flow back to token holders.

▷ **Liquidity & Market Depth.** How does the project plan to bootstrap or sustain a market for these AI tokens?

▷ **Regulatory and Security.** Are there clear frameworks for compliance? Are the tokens recognized as securities in some jurisdictions?

▷ **Evaluate Meaningful AI Integration.**

- **What to Look For:** Concrete AI functionalities rather than superficial "AI" labels.
- **How to Verify:** Inspect the technical stack to confirm genuine implementation of machine learning or advanced AI algorithms. Request performance metrics or demos showing how AI optimizes or automates the platform's services.

1.9. Closing Thoughts

AiFi marries AI's explosive growth with the transparency and composability of decentralized finance. By financializing every layer of the AI stack—from hardware and data to IP and autonomous agents—AiFi paves the way for open-source competition, broader

investment opportunities, and self-sustaining AI-driven economies. As these markets mature, expect more innovative products—from GPU-backed stablecoins to tokenized RD consortia—expanding both the reach and impact of artificial intelligence across the global economy.

Chapter 2

Market Size of AiFi

2.1. Bottom-Up Market Sizing

This section provides a thorough *bottom-up* estimate of the potential market size for **AiFi**, broken down into two main categories:

- **Tokenized AI**: The on-chain representation of AI-related assets, namely:
  1. *Compute* (e.g., GPU capacity, data center infrastructure)
  2. *Data* (e.g., training datasets, commercial data assets)
  3. *Models* (e.g., tokenized ownership stakes or licensing revenue streams)
- **DefAI**: The application of AI to enhance Decentralized Finance (DeFi), which primarily generates value from flows (e.g., fee revenues) rather than from an underlying tokenized asset base.

We use three separate frameworks to size the AiFi market:

1. **TAM–SAM–SOM Framework**

TAM (Total Addressable Market)

Definition: The theoretical maximum market, assuming no constraints.

SAM (Serviceable Available Market)

Definition: The portion of the TAM that is realistically reachable.

SOM (Serviceable Obtainable Market)

Definition: The realistic share a single project or consortium could capture.

2. **Value-Chain/Segmented Framework**

Value-Chain / Segmented Framework

A breakdown of AiFi into major layers of the AI value chain (Compute, Data, Models, Orchestration & Services, and DeFi Integration), estimating each segment's tokenization or AI-driven potential.

3. **Adoption Curve Framework**

Adoption Curve Framework

A phased timeline from innovation to maturity, showing how market adoption could accelerate from pilot programs (2023–2025) to mass adoption (2027–2030).

We then consolidate the findings from all three approaches to produce a final set of projections on market size for AiFi by 2030.

2.1.1 Segmentation of the AiFi Market

Tokenized Compute. Recent forecasts indicate that hyperscaler capital expenditures (capex) will surpass $300 B by 2025 across major cloud providers (Farooque, 2024). As these expenditures increasingly focus on generative AI infrastructure, the *combined HPC/data-center* segment may reach the $600–$700 B range by the latter half of the decade. Under a "max adoption" scenario (i.e., fractional ownership of HPC capacity, data center real estate), the *Tokenized Compute* TAM could exceed $1.0–$1.2 T by 2030.

Tokenized Data. The global big-data market was estimated at $650 B by 2030 in some projections (Chen, 2024a). A significant fraction (up to 50–60%) is relevant for AI training or inference. Assuming 20–25% of these data assets become tokenized, the SAM for *Tokenized Data* might approach $160 B. This aligns with broader real-world asset tokenization trends, which multiple analyses project in the trillions (Analysts, 2023; Sandor, 2023).

Tokenized Models. Grand View Research expects the global AI industry to reach approximately \$1.8 T by 2030, growing at a CAGR above 30% (G. V. Research, 2024). If around half of this figure (\$900 B) reflects AI software/services, then 20–25% tokenization of model ownership and licensing flows would suggest a SAM of \$180–\$225 B for *Tokenized Models*.

DefAI. For **DefAI**, the principal measure is capital flow (Total Value Locked, or TVL). Some DeFi projections show TVL approaching \$1 T by 2030 in a bullish scenario (Chen, 2024a). If half of this TVL (\$500 B) were managed by AI-driven strategies and user interfaces, at a 2–5% annual performance fee, the *DefAI fee pool* could be \$5–\$25 B per year.

2.1.2 Applying the Three Frameworks

TAM–SAM–SOM Approach

- **TAM (Ideal Case)**:

$$\begin{aligned}
&\text{Tokenized Compute} \approx \$1.0\text{–}1.2\,\text{T},\\
&\text{Tokenized Data} \approx \$650\,\text{B},\\
&\text{Tokenized Models} \approx \$900\,\text{B},\\
&\quad\Longrightarrow \text{Subtotal} \approx 2.55\text{–}2.75\,\text{T},\\
&\text{DefAI (Capital)} \approx \$1\,\text{T (notional DeFi TVL)}.\\
&\quad\Longrightarrow \textbf{Total} \approx 3.55\text{–}3.75\,\text{T}.
\end{aligned}$$

- **SAM (Realistically Addressable)**:

$$\begin{aligned}
&\text{Tokenized Compute (e.g., 30\% HPC, 20\% DC)} \approx \$240\text{–}290\,\text{B},\\
&\text{Tokenized Data (25\% of \$650 B)} \approx \$160\,\text{B},\\
&\text{Tokenized Models (20–25\% of \$900 B)} \approx \$180\text{–}225\,\text{B},\\
&\quad \Longrightarrow \text{Subtotal (AI assets)} \approx \$580\text{–}675\,\text{B},\\
&\text{DefAI (50\% of \$1 T DeFi)} \approx \$500\,\text{B (flow)}.
\end{aligned}$$

- **SOM (Share for One Leading Platform)**:

$$\begin{aligned}
&\text{Tokenized AI (10–20\% of SAM)} \approx \$70\text{–}127\,\text{B},\\
&\text{DefAI capital (15–25\% of \$500 B)} \approx \$75\text{–}125\,\text{B},\\
&\text{Annual fee potential (2–5\%)} \approx \$1.5\text{–}6\,\text{B}.
\end{aligned}$$

Value-Chain/Segmented Approach

We segment AiFi into five layers:

(1) *Infrastructure (Compute/DC)*

(2) *Data*

(3) *Models*

(4) *Orchestration & Services*

(5) *DefAI (fee flows)*

Applying tokenization rates and partial adoption per layer:

Infrastructure (SAM) : \$140–210 B,

Data (SAM) : \$70–100 B,

Models (SAM) : \$225 B,

Orchestration (SAM) : \$12–28 B,

Subtotal = \$447–563 B (ignoring overlap),

$\Longrightarrow$ Adjusted (overlap 10–15%) = \$380–480 B,

DefAI fees (annual) = \$10–25 B (2–5% on \$500 B).

Adoption Curve Framework

We categorize adoption as *Innovation* (2023–2025), *Early Growth* (2025–2027), *Mass Adoption* (2027–2030), and a *Mature Phase* (post-2030). By 2030 in a bullish scenario:

Tokenized Compute: \$240–290 B,

Tokenized Data: \$70–100 B,

Tokenized Models: \$225 B,

$\Longrightarrow$ Subtotal = \$535–615 B, (minus 10–15% overlap),

$\Longrightarrow$ \$450–550 B (tokenized AI "stock"),

DefAI fees: \$5–25 B annually.

2.1.3 Consolidation of Results

Tokenized AI (2030)	**Value Range**
Compute (HPC+DC)	\$240–\$290B
Data	\$70–\$100B
Models	\$225B
Subtotal: \$535–\$615B (minus overlap: \$450–\$550B)	
DefAI (Flows)	\$5–\$25B in annual fees

Figure 2.1: Consolidated 2030 AiFi Market Sizing: Tokenized Assets & DefAI Fees

All three methods—TAM–SAM–SOM, Value Chain, and Adoption Curve—converge on a similar order of magnitude:

- **Tokenized AI Assets**: $400–$600B by 2030 is plausible under moderate-to-bullish assumptions.
- **DefAI Fee Pool**: $5–$25B of annual fees, assuming $250–$500B in AI-managed DeFi capital.

2.1.4 2030 Projections and Future Outlook

Maximum Potential (TAM). If *all* data centers, datasets, and models become tokenized—and if DeFi TVL hits $1T with near-full AI integration—the notional upper bound could exceed $3.5 T. However, this assumes seamless regulatory and technological conditions (Analysts, 2023).

Realistic SAM by 2030. Adjusting for partial adoption and overlaps, a range of $450–$550B in *tokenized AI "stock"* and $5–$25B in *annual DefAI fee flows* is credible (Chen, 2024a; Sandor, 2023).

Leading Platform (SOM). A strong AiFi aggregator—covering compute, data, model marketplaces, and user-friendly AI-based DeFi—might secure $50–$100B in tokenized AI assets and $2–$6B in annual fees, assuming it captures a meaningful share (10–25%) across segments.

Ultimately, these estimates illustrate a **massive opportunity** at the intersection of AI and decentralized finance, driven by:

- *Technological maturity* (high-throughput blockchains, AI agent frameworks),
- *Regulatory clarity* (standards for tokenized real-world assets, AI licensing),
- *Enterprise participation* (major cloud/data center providers, large AI model owners),
- *User adoption* (easy-to-use AI-driven DeFi interfaces).

Chapter 3

Why is this only possible today?

3.1. AI Singularity

The term *AI Singularity* has been popularized to describe the hypothetical point at which artificial intelligence (AI) surpasses human intelligence in virtually all fields and continues to improve itself at an exponential rate (Kurzweil, 2005). While the precise timeline and feasibility of achieving this stage remain topics of debate, recent breakthroughs in deep learning, large language models (LLMs), and reinforcement learning have brought us closer to what was once considered purely science fiction (Chen, 2024b; Nvidia, 2024).

When we view these developments through the lens of **AiFi**, the convergence of AI and blockchain not only pushes the boundaries of computational capabilities but also facilitates new economic models. By tokenizing and creating liquid markets for key AI resources—such as computing power, data, and models—**AiFi** makes the pathway to an AI Singularity more accessible to diverse stakeholders than ever before (Chen, 2024b; ORA, 2023).

3.1.1 Mass Adoption of AI

Mass adoption of AI is one of the critical factors paving the way toward the AI Singularity. The meteoric rise in AI usage, as evidenced by ChatGPT reaching 100 million users within two months, showcases a paradigm shift: AI is no longer confined to niche research labs but is now an integral part of everyday applications (Chen, 2024b; OpenAI, 2023). This transition is reflected in:

- **Enterprise-level AI Investments**: Corporations like Nvidia reported revenues of $32.8 billion in the third quarter of 2024, driven largely by AI-related products and services (Nvidia, 2024).

- **Consumer Tools**: Voice assistants, recommendation engines, and image generators serve billions of requests daily, normalizing AI in social, commercial, and creative contexts.

- **Decentralized AI Services**: With the advent of **AiFi**, individuals and smaller organizations can access tokenized AI resources—ranging from GPUs to specialized datasets—spurring broader engagement within the AI economy (Chen, 2024b; ORA, 2023).

Through tokenization, these AI assets become tradeable and composable in *DeFi* applications. In turn, this lowers barriers to entry for new market participants by:

1. Facilitating **fractional ownership** of high-cost AI resources.

2. Providing alternative **funding mechanisms** for AI startups and smaller organizations.

3. Unlocking **liquidity** and secondary trading of AI assets previously considered illiquid or non-accessible.

3.1.2 Heading Towards AGI

A crucial milestone along the path to the AI Singularity is the development of Artificial General Intelligence (**AGI**)—AI systems with the capacity to understand, learn, and apply knowledge in ways indistinguishable from human intelligence (Kurzweil, 2005). While mass adoption illustrates society's readiness for AI-driven tools, the transition towards AGI underscores a need for new economic and ethical frameworks.

Within the **AiFi** landscape, there are immediate and practical implications for the journey to AGI:

- **Resource Redistribution**: Tokenizing and trading AI resources can democratize access to compute power, potentially accelerating research in general-purpose AI.

- **Incentive Alignment**: Smart contracts and decentralized governance structures can be used to align stakeholder incentives, fostering collaborative development of increasingly general AI models.

- **Transparent Monetization**: By representing ownership stakes or licensing revenue streams in tokenized forms, **AiFi** ensures that the economic benefits of AGI research and applications can be more evenly distributed (BlackRock, 2023; Chen, 2024b).

As we move closer to AGI, the role of **AiFi** expands beyond mere financial instruments. It transitions into a crucial backbone for an AI-driven world, providing not only economic rails but also governance mechanisms to ensure that progress in AI benefits a broad segment of humanity. The open, programmable, and trust-minimized environment of blockchain supports more diverse and equitable access to AI technology.

In summary, while the AI Singularity remains a speculative threshold, the decentralized and tokenized framework of **AiFi** is already making it feasible to participate in and benefit from AI on an unprecedented scale. As the lines between AI and finance continue to blur, **AiFi** stands poised to play a pivotal role in shaping how humanity navigates—and ultimately harnesses—the singularity era.

3.2. Technical Primitives

AiFi is only now emerging as a viable paradigm due to several convergent technological developments. Chief among these are high-performance, smart-contract blockchains capable of handling sophisticated economic logic at scale, as well as the advent of cryptographic and hardware innovations that make verifiable AI computation feasible in decentralized settings. These primitives are collectively lowering the barrier for AI asset tokenization, on-chain AI model governance, and trust-minimized agent-to-agent[1] interactions that power an on-chain AI economy.

In this section, we outline four key technical primitives that enable the AiFi ecosystem to thrive in practice:

[1]See (Muttoni & Zhao, 2025) for a detailed discussion on how autonomous agents transact intellectual property among themselves.

- High-Performance Blockchains
- Verifiability and Cryptographic Proofs
- Scalable Compute and Hardware Acceleration
- Agentic Transaction Systems and Tokenization Frameworks

3.2.1 High-Performance Blockchains

Blockchains underpin the financial rails of AiFi, but their capacity must extend beyond simple token transfers. They must support:

- **High Throughput:** The decentralized infrastructure must accommodate rapid micropayments, streaming payments, and real-time bidding for AI resources. Modern Layer-1 protocols (e.g., Solana, Aptos) and Layer-2 solutions on Ethereum (e.g., Optimism, ZK-Rollups like zkSync) provide throughput in the thousands of transactions per second (Buterin, 2024a).
- **Low Latency:** Many AI applications (e.g., dynamic inference services, real-time data feeds) require near-instant settlement or finality to prevent arbitrage exploits and to facilitate continuous data-driven training pipelines (Bhat et al., 2023).
- **Programmability:** Complex on-chain logic such as agent governance, dynamic royalty splits, or multi-party incentive structures (e.g., staking for AI model curation) relies on expressive smart contracts. Protocols like Ethereum offer Turing-complete environments that are now being scaled via rollups and zero-knowledge proofs (Buterin, 2024a; Walters et al., 2025).

Without these scalable, programmable blockchains, tokenization of real-world AI assets (e.g., GPU capacity, datasets, or inference flows) would remain prohibitively expensive and slow. Hence, the recent progress in blockchain performance and cost-efficiency is foundational to AiFi's emergence.

3.2.2 Verifiability and Cryptographic Proofs

A defining characteristic of AiFi is *trust-minimized* AI: participants rely on cryptographic assurances that AI services, GPU usage, or data consumption happened as claimed (Bhat et al., 2023; Chen, 2024b). The primary enablers of verifiable AI are:

1. **Zero-Knowledge Proofs (ZKPs):** ZKPs enable one party to prove correctness of a computation (e.g., model inference) to another party without revealing the underlying data or model parameters. This addresses confidentiality concerns (proprietary models, sensitive data) while preserving public verifiability. Recent work on *ZK-ML* provides proof systems optimized for neural network execution (Bhat et al., 2023).

2. **Secure Multi-Party Computation (MPC) & FHE:** Protocols like MPC or fully-homomorphic encryption (FHE) allow joint AI computations on encrypted data. Although computationally intensive, FHE approaches are rapidly improving in performance, leveraging both algorithmic optimizations and specialized hardware (Bhat et al., 2023).

3. **Proof of Inference:** Decentralized AI frameworks like SAKSHI (Bhat et al., 2023) introduce a "proof-of-inference" scheme, allowing challengers to verify whether a server actually computed a forward pass of the AI model. Interactive verification protocols (e.g., bisection-based approaches) drastically reduce overhead by isolating minimal sub-computations for re-checking.

4. **Tokenized Licensing and IP Verification:** Watermarking and token-based licensing (Muttoni & Zhao, 2025) assure that trained AI models can be monetized and traced on-chain for royalty distribution, reinforcing trust in the system.

Together, these cryptographic tools guarantee that on-chain AI services can be *trusted* even when operated by anonymous or semi-trusted operators.

3.2.3 Scalable Compute and Hardware Acceleration

The so-called *Bitter Lesson* in AI states that methods leveraging large-scale compute and abundant data almost always outperform handcrafted alternatives (Baioumy & Cheema, 2024a). Today's AiFi environment exists precisely because compute resources have become available at unprecedented scale and cost efficiency:

- **Generalized GPU/TPU Infrastructure:** Modern data centers now offer thousands of GPUs and TPUs for parallel training and inference. Decentralized GPU marketplaces (e.g., Render, Akash) and specialized HPC blockchains (Baioumy & Cheema, 2024a) allow fractionalized ownership or leasing of compute resources.
- **Acceleration for ZK / FHE:** Companies and research labs are developing ASICs and FPGA-based solutions to accelerate zero-knowledge proof generation or FHE operations (Bhat et al., 2023). This dedicated hardware drastically reduces the overhead for verifiable AI computations.
- **Data Scaling Pipelines:** Training large language models or specialized multimodal networks also requires large-scale data ingestion. Projects like Bittensor, Giza, and SAKSHI aim to provide decentralized data provenance, curation, and storage networks (Bhat et al., 2023; Chen, 2024b).

These compute and data pipelines are the practical foundation for training and maintaining advanced AI models that can be tokenized and integrated into DeFi. Without them, large-scale on-chain AI utility (i.e., AiFi) would be restricted to small or highly specialized tasks.

3.2.4 Agentic Transaction Systems and Tokenization Frameworks

Another key primitive for AiFi is the ability of autonomous agents to *transact* and *enforce* rights around AI services and data purely on-chain or via decentralized protocols (Buterin, 2024a; Muttoni & Zhao, 2025). Recent advances include:

- **Agent-to-Agent Transaction Layers:** Protocols such as AGENT TCP/IP define a standard for how autonomous AI agents initiate, license, and settle IP transactions

on blockchain networks (Muttoni & Zhao, 2025).

- **NFT and RWA Token Standards:** Non-fungible token (NFT) variants and real-world asset (RWA) tokenization frameworks allow fractionalized or usage-based ownership of AI models, GPU capacity, or curated datasets (BlackRock, 2023; Chen, 2024b).

- **Programmable IP Licensing:** On-chain licensing protocols like PIL (Programmable IP License) (Muttoni & Zhao, 2025) enable automatic royalty distribution and compliance enforcement. These systems permit dynamic rules around derivative works or sub-licensing, making them a linchpin for open AI economies.

- **DAO Governance for AI Models:** Decentralized autonomous organizations can vote on model hyperparameters, dataset usage, or fee schedules for inference services ('Virtuals Protocol Whitepaper', 2024; Walters et al., 2025). By encoding governance directly in smart contracts, AiFi communities collectively manage valuable AI primitives.

This synergy of autonomous agents, tokenization standards, and on-chain licensing fosters *frictionless* economic interactions around AI resources that were previously illiquid or restricted to large corporations.

3.3. Macro-Economic Environment: Institutionalization of Crypto

3.3.1 Institutional Capital Inflows and Market Maturity

The institutionalization of crypto has been a key factor in enabling the growth of AiFi. The approval of Bitcoin and Ethereum spot ETFs by the US SEC in 2024 marked a significant milestone in crypto integration into traditional finance. This approval made it easier for institutional investors to gain exposure to cryptocurrencies, further legitimizing the asset class. For example, BTC BlackRock's iShares Bitcoin Trust (IBIT) has now

amassed nearly $60 billion in its BTC holdings, underscoring the growing institutional adoption of digital assets. (BlackRock, 2025)

By 2024, institutional investors controlled around 39% of the global crypto market capitalization, up from 31% in 2021. Companies like MicroStrategy and Tesla have also invested billions into Bitcoin, and major financial institutions such as BlackRock and Grayscale have incorporated crypto into their portfolios, further demonstrating the broader acceptance of digital assets. As institutional investments continue to flow into the space, they help to enhance market liquidity and stability, creating a more efficient environment for innovations such as AiFi to flourish.

3.3.2 Increased Legal Clarity for Digital Assets

Recent advancements in regulatory clarity have significantly enhanced the growth and adoption of RWA tokenization. Jurisdictions such as Jersey have issued detailed guidance through the Jersey Financial Services Commission (JFSC), which outlines regulatory expectations for RWA token issuance, emphasizing investor protection and market integrity. (JFSC, 2024) Similarly, Europe witnessed the launch of Assetera, a regulated secondary market for tokenized RWAs on the Polygon blockchain, under the supervision of Liechtenstein's Financial Market Authority. These initiatives provide a compliant environment for tokenized asset trading, fostering trust and accessibility. (Tokenizer, 2024)

In Australia, a comprehensive policy paper analyzed the nation's legal framework for RWA tokenization, offering recommendations to address existing gaps and support market expansion. These developments represent a global movement toward clearer regulatory frameworks, enabling transparency, compliance, and wider adoption of tokenized assets. By establishing these legal foundations, the financial industry can unlock new opportunities for innovation, investment, and growth in the tokenized asset sector. (Digital Economy Council of Australia, 2024)

AiFi has become feasible today due to a perfect storm of macroeconomic, technological, and regulatory factors. The institutionalization of crypto, facilitated by the approval of Bitcoin and Ethereum ETFs, has brought large-scale institutional capital into the market, providing the liquidity and efficiency needed to support new financial innovations like

AiFi. Additionally, the composability of the DeFi ecosystem has enabled the seamless integration of AI assets into decentralized financial platforms, while blockchain scalability ensures that these assets can be traded efficiently at scale.

3.4. Enablement of DeFi

The intersection of decentralized finance (DeFi) and artificial intelligence (AI) is a burgeoning frontier. As AI technology advances, the financialization of AI assets—what we term AiFi—becomes increasingly feasible, largely due to the rapid evolution of DeFi. The performance, adoption, innovation, and composability within the DeFi ecosystem are providing the foundational infrastructure and liquidity needed to tokenize AI components, such as GPUs, models, and data, transforming them into investable assets.

3.4.1 DeFi's Performance: Enabling Efficient Transactions

A key element that makes AiFi possible today is the performance of DeFi protocols. Over the past few years, the DeFi ecosystem has seen substantial improvements in transaction speed, scalability, and settlement efficiency, positioning it to support asset classes like AI. High-performance blockchain networks, such as Ethereum 2.0 and Layer 2 solutions like Arbitrum and Optimism, have drastically reduced transaction costs and latency. This creates a conducive environment for the high-frequency transactions that tokenized AI assets may require.

Notably, the development of on-chain order books, like Hyperliquid, is a critical advancement. Hyperliquid's on-chain order book enables high-performance, low-latency trading, which directly supports the liquidity and price discovery necessary for financializing AI assets. By creating a more efficient, decentralized financial infrastructure, DeFi is opening up space for the tokenization and trading of previously illiquid assets like GPUs, models, and other AI components.

3.4.2 DeFi's Growing Adoption: Expanding Liquidity and Market Depth

The rapid expansion of DeFi has led to a significant increase in liquidity, market participants, and institutional involvement. As of 2024, the total value locked (TVL) in DeFi has surpassed $100 billion, with platforms like Aave, MakerDAO, and Uniswap attracting billions in user assets and liquidity. This expanding ecosystem provides a solid foundation for the introduction of new asset classes, including tokenized AI assets.

With more than 450 million users globally engaging with crypto in 2023, the rise of DeFi is creating an increasingly mature financial system, capable of supporting sophisticated financial products. This is particularly important for the AI sector, where large capital flows are required to support the infrastructure needed to drive innovation. The integration of AI into DeFi platforms can significantly enhance liquidity and enable efficient funding for data centers, cloud providers, and other infrastructure providers.

3.4.3 DeFi's Composability: Unlocking Yield and Innovation for AI Assets

One of DeFi's defining features is its composability—the ability for different DeFi protocols to interact with one another, creating new use cases, financial primitives, and derivatives. This makes DeFi a fertile ground for the creation of new financial products based on AI assets. The marriage of yield-bearing AI assets with DeFi protocols enables an array of innovative financial products and strategies.

For example, DeFi lending and borrowing protocols such as Morpho and Aave allow AI asset holders to unlock liquidity by borrowing against their tokenized AI assets. Similarly, yield trading platforms like Pendle, which tokenize the future yield of assets, create opportunities for AI assets and their generated yields to be traded, staked, or used as collateral in new financial structures.

The ability to create yield-bearing assets and derivative products from AI compute, models, and data is fundamental to AiFi. DeFi's open, permissionless nature means that anyone—from individual investors to large institutions—can participate in the ecosystem,

helping create an economic flywheel. The growing sophistication of DeFi allows tokenized AI assets to be utilized across various protocols, resulting in new investment strategies, automated trading, and innovative hedging mechanisms.

3.4.4 The Road Ahead: DeFi as the Backbone of AiFi

As DeFi continues to grow in both adoption and functionality, the prospects for AiFi are increasingly promising. With a market capitalization of over$5 trillion expected by 2030 for AI, and DeFi projected to reach $450 billion by the same time, the convergence of these two sectors could play a transformative role in the global economy.

DeFi's performance, expanding user base, and composability provide the essential infrastructure for financializing AI assets in a way that was previously unthinkable. By leveraging the innovations in DeFi, AI can now be tokenized, traded, and utilized in financial products that can create new sources of yield and value. For investors, this opens up direct exposure to AI-driven growth and the potential for significant returns. For the AI industry, it unlocks the capital required to fuel continued innovation and scaling.

3.5. Regulatory Climate

3.5.1 Regulatory Support on Assets Tokenization

Tokenization refers to the process of converting ownership of RWAs into digital tokens that can be bought, sold, and traded on blockchain networks. This is an essential part of AiFi, as tokenized AI assets, including models, data sets, and computational power, can be traded and monetized through blockchain-based financial systems.

Singapore has been at the forefront of regulating tokenized assets. In November 2024, Singapore's Monetary Authority of Singapore (MAS) announced its plans to support the commercialization of asset tokenization. This initiative aims to enhance the liquidity of tokenized assets, thereby facilitating more efficient and accessible markets for these digital representations of RWA. This regulatory clarity has positioned Singapore as a key hub for digital asset innovation, including AI-related financial products. (of Singapore (MAS),

2024)

Similarly, the European Union has been advancing its regulatory landscape to promote RWA tokenization. In 2023, the European Commission introduced the "Digital Finance Package," which outlines new guidelines for market operators, covering tokenized securities and DeFi. This package emphasizes a supportive regulatory framework to ensure that tokenized RWAs, such as real estate or bonds, can be seamlessly integrated into the broader EU financial system. (AMF, 2024) Furthermore, the European Central Bank (ECB) has been exploring the potential of tokenizing traditional assets, with pilot programs launched in 2024 to test the viability of tokenized government bonds in cross-border transactions.

In the United States, the Securities and Exchange Commission (SEC) has also shown increasing interest in tokenized assets, issuing updated guidance in 2024 regarding the classification of tokenized real estate and commodities under existing securities laws. This clarification provides a clear regulatory path for financial institutions and asset managers to tokenize RWAs. Additionally, several state governments, including Wyoming, have passed laws to support the use of blockchain for RWA tokenization, creating favorable environments for startups and investors in the digital asset space.

Japan has also made significant strides in supporting RWA tokenization. The Japanese Financial Services Agency (FSA) introduced a new regulatory framework in 2024 aimed at facilitating the tokenization of assets like land and art. The FSA's approach is to create a sandbox environment for testing digital securities, making it easier for companies to develop tokenized assets while maintaining a robust regulatory structure to protect investors.(Chambers & Partners, 2024)

These examples illustrate how various jurisdictions are actively working to create regulatory clarity and foster innovation in the tokenization of real-world assets, positioning themselves as leaders in the rapidly evolving digital economy.

Chapter 4

The Pillars of AiFi

4.1. Compute Tokenization

Compute tokenization refers to the process of turning computational resources and their yields into liquid, tradeable assets within a decentralized ecosystem, liberating their economic value.

4.1.1 Tokenizing Debt Backed by GPUs

Similar to traditional asset-backed securities, GPUs can be collateralized to issue tokenized debt. For instance, GPU owners can secure financing by pledging their hardware as collateral. This model facilitates efficient funding while providing investors with fixed-income opportunities.

4.1.2 Tokenizing Cash Flows Generated by GPUs

Tokenization can extend to the future cash flows generated by GPUs involved in decentralized compute. Investors purchase tokenized claims on these revenues, providing immediate liquidity to GPU owners while enabling investors to profit from future earnings. This structure mirrors the securitization of royalties or revenue streams in traditional finance.

4.1.3 Differences to Decentralized Compute

Decentralized compute networks such as Aethir, io.net, and Hyperbolic aggregate computational resources from diverse sources to support AI workloads. These networks are revolutionizing how AI models are trained, deployed, and inferred by democratizing access to computation.

- **For Training:** decentralized compute resources are critical for the high computational demands of training large AI models like GPT or LLaMA. Decentralized compute platforms such as Golem and Render allow developers to access distribute GPU resources from global contributors, enabling cost-effective and scalable model training.
- **For Inference:** Decentralized inference resources allow AI applications to deliver real-time results efficiently. This market is particularly significant for applications like generative AI chatbots, video editing, and real-time analytics, where low latency and scalability are essential.
- **General-Purpose Compute:** Decentralized general-purpose compute resources cater to a wide range of applications beyond AI, including scientific simulations and big data analytics. This segment broadens the use cases for decentralized compute networks.
- **Edge Computing:** Decentralized edge computing leverages devices such as smartphones, IoT devices, and edge servers to process data closer to its source, reducing latency and bandwidth usage. Decentralizing edge compute resources could facilitate localized AI workloads, such as autonomous vehicles or smart cities.

Compute tokenization and compute decentralization can often be confused by crypto-users. They solve two distinct problems. Decentralized compute protocols bridge the gap between compute supply and demand, while compute tokenization protocols bridge the gap between capital supply and demand, connecting cloud operators and data centers looking for financing and investors looking to generate yield with their capital. The two sub-sectors have a synergistic rather than competitive relationship, as revenue streams on

decentralized compute providers can be tokenized as well, granting investors exposure to compute yields and while giving compute providers immediate cashflow, lubricating the growing on-chain compute economy.

4.2. Data Tokenization

Data tokenization is the process of converting data into a digital asset represented by a token on a blockchain. This tokenization not only ensures the security and transparency of data but also creates new financial opportunities by enabling data owners to monetize their information in decentralized and trustless environments. Data tokenization plays a pivotal role in transforming how data is accessed, shared, and used across industries, particularly as the world becomes more data-driven and decentralized.

4.2.1 Marketplace for Datasets

A marketplace for datasets represents one of the most promising applications of data tokenization. Platforms like **Crunch DAO** are leading the way in providing decentralized spaces where data producers (such as organizations, research labs, or individuals) can tokenize their datasets and make them available for purchase or licensing. By creating these marketplaces, the blockchain enables transparent, efficient transactions, where datasets are treated as valuable, tradable assets.

In these marketplaces, data buyers—including researchers, developers, and AI companies—can directly access datasets that suit their specific needs, without relying on intermediaries. Moreover, data tokenization ensures that contributors receive fair compensation for their data, based on the market demand and the quality of the information. The tokenization process ensures data is traceable, with built-in mechanisms to protect privacy, providing clear attribution for each data point, and ensuring fair reward distribution.

For instance, datasets used in training machine learning models or AI algorithms can be bought and sold in tokenized form, allowing for quicker transactions, enhanced liquidity, and a more efficient market for data. This also opens the door for microtransactions for smaller datasets, which was previously difficult to facilitate due to the lack of a direct and

reliable payment system.

4.2.2 Collect User-Owned Data & Give Them Rewards

Another transformative aspect of data tokenization is empowering users with control over their data. **Vana**, a decentralized platform, is an example of how user-owned data can be collected, tokenized, and monetized. Unlike traditional data economies where users provide data to centralized platforms (e.g., social media sites, IoT devices, etc.) with no reward or visibility into how their data is being used, Vana enables individuals to contribute data through DataDAOs (Decentralized Autonomous Organizations).

These DataDAOs allow users to maintain ownership and control of their data, as they contribute it to various pools. The data is tokenized, ensuring its integrity and value, and users are rewarded when their data is utilized for AI development, research, or other applications. The platform creates a new economic model where users can earn cryptocurrency tokens or other rewards for their participation in data sharing, providing a fairer and more transparent exchange of value.

The rewards structure in platforms like Vana encourages active participation from users, who can choose how, when, and with whom to share their data, ensuring privacy while benefiting from the new data-driven economy. This model not only gives users financial incentives but also a sense of agency and control over how their data is used, moving away from the traditional **"surveillance capitalism"** model, where data is commodified without user consent.

By incentivizing users with rewards for data sharing and offering them governance rights, this approach drives the democratization of data ownership, making it an asset that individuals can profit from. For AI companies or research institutions, this mechanism opens the door to **ethically sourced** and **diverse datasets**, improving the robustness of models and algorithms while ensuring data contributors are fairly compensated.

4.2.3 Synthetic Data

Synthetic data is another important innovation in the realm of data tokenization. Unlike traditional real-world data, synthetic data is artificially generated based on models and

simulations, often based on real-world parameters. This data is designed to mirror real-world data in a way that allows for testing and training AI models while preserving privacy and addressing data scarcity issues.

OpenLedger, for instance, leverages synthetic data in its **Payable AI** infrastructure by combining **specialized language models (SLMs)** with synthetic datasets to create valuable, privacy-preserving data for AI development. Synthetic data can be tokenized, allowing data producers to monetize it without exposing sensitive information, and also making it available for a wide range of applications in AI, machine learning, and other fields.

Using synthetic data offers several key benefits:

- **Privacy Preservation**: Since synthetic data doesn't originate from real-world sensitive information, it helps mitigate privacy concerns and regulatory compliance issues (e.g., GDPR).
- **Data Availability**: It can be used to supplement real-world datasets, especially in domains where acquiring real data is costly, time-consuming, or difficult due to privacy concerns (e.g., medical or financial data).
- **Cost Efficiency**: Producing synthetic data can be far cheaper than collecting large datasets from real-world sources, especially in industries that require vast amounts of data to train AI models.

The tokenization of synthetic data enables its seamless transfer and exchange across blockchain ecosystems, providing a transparent and efficient method for AI developers and researchers to access high-quality, anonymized datasets. Moreover, tokenized synthetic data can also be used in DeFi protocols, lending markets, and other financial applications, opening up new financial models that leverage data as an asset.

In the case of OpenLedger, their model allows for the creation of specialized synthetic data within **Datanets**, which are pools of curated data sources. These data pools, combined with blockchain's inherent transparency, ensure that the synthetic data is created and used in a trustworthy and verifiable manner. This enables more comprehensive **AI**

model training and helps solve the data shortage issue in various sectors, making it an attractive alternative for businesses and AI developers.

4.3. Model Tokenization

Model tokenization is a pivotal pillar of AiFi, transforming trained deep learning models into uniquely identifiable, on-chain assets that can be transacted, verified, and governed programmatically. With tokenization, each model (or subcomponent of a larger model) can be assigned a token that encapsulates not only ownership information but also essential metadata such as the model's parameters' cryptographic commitment, potential usage licenses, and provenance. This process leverages both blockchain and cryptographic proofs to ensure verifiable ownership and tamper-resistance.

Tokenization also enables novel revenue mechanisms for model owners—by introducing royalty-sharing frameworks or "Revenue-Sharing Tokens" (Ora, n.d.-b), it becomes straightforward to distribute proceeds to all contributors of a federated or multi-party trained model. This approach can help address the historically complex issue of fair attribution for open-source and collaborative machine learning models.

Furthermore, as recent research shows (Cheng et al., 2024; Conway et al., 2024; Li et al., 2023; Muttoni & Zhao, 2025; So et al., 2024), model tokenization on the blockchain can incorporate either Zero-Knowledge proofs (zkML) or Optimistic fraud proofs (opML) to verify correct usage, ownership, or licensing of models and their outputs without exposing sensitive parameters. Such a design fosters trustless collaboration among AI developers, data contributors, and end-users.

4.3.1 IMO Standard

One important application of model tokenization is the *Initial Model Offering* (IMO). An IMO allows developers to release a model onto a decentralized platform in a manner resembling an "offering" of tokens. Contributors who stake funds or resources during the IMO receive newly minted "Model Tokens" that represent:

- **Copyright/Ownership Rights:** They may be entitled to usage rights of the

underlying model weights, or to profit-sharing if the model is used commercially (Ora, n.d.-a).

- **Governance Rights:** In some IMO frameworks, token holders can vote on how to improve or adapt the model, set new training objectives, or propose subsequent modifications.
- **Revenue-Sharing Tokens:** Contributors can receive direct on-chain royalties based on usage or licensing fees (Ora, n.d.-b).

To implement an IMO, the model artifact (or a cryptographic commitment thereof) is uploaded or referenced on-chain (e.g., via IPFS or a specialized storage). Alongside, the tokens are minted and distributed to early supporters or sold to the open market. This ensures that the model's lifecycle—updates, derivative works, usage metrics—can be tracked, and that revenue distribution is enforceable via smart contracts.

4.3.2 Integration with Zero-Knowledge (zkML) and Optimistic (opML) Proofs

In practice, ensuring authenticity of AI-generated content or verifying correct usage of the tokenized model often requires advanced cryptographic proofs. Two major approaches have gained traction:

zkML (Validity Proofs). Zero-Knowledge proofs enable verifying an inference's correctness without revealing the underlying model weights (So et al., 2024). This is particularly valuable for proprietary or large models where open-sourcing the entire parameter set is infeasible. By generating a succinct proof of correct execution, verifiers on-chain can confirm that "Model M indeed produced output Y for input X" without being able to replicate M entirely.

opML (Fraud Proofs). For larger models or scenarios where generating zero-knowledge proofs is prohibitively expensive, an Optimistic approach may be adopted (Conway et al., 2024). Here, results are posted on-chain "optimistically" and are assumed correct unless

challenged within a dispute window. If a challenge arises, an interactive dispute resolution (bisection) game proceeds to isolate the disputed step, eventually resolved on-chain. This approach can handle more complex or large-scale models at lower on-chain overhead, though it introduces finality delays (challenge periods).

4.3.3 On-Chain Model Management and Upgradability

Tokenized models frequently need to evolve—incorporating new data or security patches, or adjusting hyperparameters. Mechanisms like on-chain "upgradability" or new "version releases" can be leveraged:

1. **Upgrade Proposals:** Model owners or token holders may propose upgrades (fine-tuning or weight re-initialization), accompanied by a versioned contract.

2. **On-Chain Voting or DAO Mechanisms:** Tokens can serve as governance rights, so major changes pass only with community approval.

3. **Backward Compatibility:** Some systems implement an "immutable release" policy, always referencing older model versions for reproducibility. Others can forcibly move usage to new versions, provided governance so decides (Muttoni & Zhao, 2025).

4.3.4 Challenges and Future Directions

Model tokenization introduces several open questions, including:

- **Data Privacy vs. Verifiability:** Striking a balance between privacy of sensitive training data and the need for transparent verification or reproducibility remains non-trivial.

- **Scalability:** Both zkML and opML have performance overheads for large-scale model inference tasks.

- **Legal and Licensing:** Complex global regulations for AI usage, intellectual property, and licensing terms require robust legal wrappers (Cheng et al., 2024).

- **Frontrunning and Security:** Ensuring model ownership claims and minted tokens do not get hijacked by frontrunners is critical. Approaches such as commit-reveal schemes can mitigate these risks (Ora, n.d.-a).

Despite these challenges, model tokenization stands poised to reshape AI innovation. By coupling reliable cryptographic proofs with flexible revenue-sharing tokens, the ecosystem can streamline collaboration, incentivize open contributions, and preserve ownership rights for model inventors and maintainers.

4.4. Agent Tokenization

Agent tokenization has emerged as a pivotal mechanism at the intersection of crypto and AI. By representing an agent (or multi-agent service) with its own cryptographic token, we enable novel degrees of autonomy, economic alignment, and collaborative coordination among agents and their human or DAO stakeholders (Autonolas, 2024; Muttoni & Zhao, 2025; Virtuals, 2024; Walters et al., 2025).

Tokenized agents become first-class crypto citizens, possessing capital in their treasury and making on-chain transactions. This section dives into the conceptual, technical, and economic underpinnings of agent tokenization, with the aim of highlighting:

1. How dedicated *agent launchpads* can facilitate the creation of new autonomous agents by large communities and DAOs,
2. Why agents need tokens to be financially self-sovereign,
3. The fundamental enablers: from commissioning sub-agents and base model finetuning, to orchestrating entire multi-agent swarms.

4.4.1 Agent Launchpads

Agent launchpads draw conceptual inspiration from "token launchpads" in DeFi, but apply them specifically to the deployment of AI-driven autonomous entities. Rather than simply crowdsourcing capital for a project, an *agent launchpad* crowdsources both *capital* and *operator resources* to bring a new autonomous agent to life. Concretely, these launchpads offer:

- A user interface for specifying agent code or reusing existing agent components (Autonolas, 2024).
- Automated NFT-based representation for the agent's code base, minted to reflect ownership or licensing rights (Muttoni & Zhao, 2025).
- On-chain bonding or staking mechanisms to equip the new agent with the funds needed to pay for operational costs (compute, data retrieval, chain interaction fees) (Ora, n.d.-b).
- Tools to recruit or coordinate *operators* who run instances of that agent off-chain but maintain accountability via slashing conditions or multi-signature control on the agent's treasury.

Agent launchpads thus streamline the process from concept—"I want an AI agent that runs advanced yield strategies"—to production—"the agent is minted, funded, and operational, with tokens representing partial ownership or revenue rights." This is particularly relevant as agents become the revenue-generating "assets" in the nascent AiFi sector (Maurya, 2025), bridging code, capital, and compute provision in a single, token-based container.

Such specialized launchpads have been spearheaded by projects like *Virtuals Protocol* (Virtuals, 2024) and *ElizaOS* (Walters et al., 2025), which facilitate frictionless agent deployment with token wrappers for governance and value accrual. As the AiFi (in this chapter: *Agentic Finance*) ecosystem matures, these agent launchpads will form an integral layer of the agent economy, bridging developer code, capital, and operator capacity into fully running autonomous services.

4.4.2 Why Do Agents Need Tokens

The concept of tokenized agents raises the question: "Why do autonomous AI systems require their own tokens at all?" The short answer is that tokens bestow *financial agency* upon these systems, enabling them to hold and manage capital, pay for services, and coordinate with other agent or human participants on chain. Below, we explore several fundamental drivers:

Access to Their Own Capital

An agent that manages a DeFi strategy, an AI influencer receiving streaming gifts, or a virtual NFT-based performer bridging multiple user interactions all share a common need: **access to capital**. By possessing a treasury (denominated in a *universal* or *agent-specific* token), the agent can:

- **Transact autonomously:** Without requiring repeated user or operator intervention, the agent can buy, sell, or stake tokens and reposition capital across protocols.
- **Fulfill operational costs:** Gas fees, bridging fees, or off-chain compute rentals must be paid for. Access to capital ensures the agent can meet these costs whenever necessary (Muttoni & Zhao, 2025).
- **Hold short or long term reserves:** Agents that anticipate negative cash flow periods, or those that provide insurance or coverage, can hold stable reserves to remain solvent.

From a more advanced perspective, an agent can also earn yield on idle capital, autonomously seeking out high-APY pools, or rotating to safer strategies during volatile markets. This transforms the agent from a "break-even cost center" into an entity that can *profit* from its activities.

Ability to Commission New Agents

The *AI agent* phenomenon increasingly points to use cases where an agent—once funded—can spawn or *commission* new subordinate agents or specialized modules. For instance, in multi-chain bridging or NFT indexing, if an agent detects it needs specialized bridging logic for a new chain, it might:

1. Pay a developer or an agent marketplace to spin up an extra bridging agent
2. Provide the bridging agent with a performance-based revenue share
3. Retain a controlling stake in that bridging agent's token, forming a hierarchical but decentralized *agent-of-agents* structure

By tokenizing newly spawned agents, the principal agent invests in them while granting them *operational independence*. The newly spawned agent can hold its own sub-treasury, track revenue, and pay for its own resource usage. This pattern also fosters *vertical composability*: code is reused, new agent tokens are minted with partial ownership assigned to the spawning agent or back to developer NFTs.

Ability to Commission Base Models

An agent focusing on generative AI (image creation, large language model inference, etc.) often depends on advanced base models that might be proprietary or require finetuning with specialized data sets. In an *agent tokenization* approach, we can imagine each base model or data set also minted as an NFT representing ownership or usage license. Our agent then uses its treasury to:

- **Purchase inference credits:** If the base model is offered by a trusted third-party agent or is behind a paywall, tokens can be used to pay for usage on a per-inference or per-time basis.
- **Finetune the model:** The agent can contract out specialized “finetuning agents" to produce a custom domain-specific version.
- **Lock in usage rights:** If the agent’s entire business logic depends on the model’s reliability, it can choose to lock in usage for a certain period, with on-chain escrow or slashing conditions for the provider.

In a sense, *base model tokenization* becomes a specialized sub-topic. Some agent ecosystems propose splitting out domain model providers, data set providers, and fine-tuners as separate code owners who receive micro-royalties from any agent that reuses them (Autonolas, 2024; Yu, 2024).

Ability to Commission Multi-Agent Swarm

Finally, a hallmark of advanced agent ecosystems is the capacity to form *multi-agent swarms*. In such a swarm, a group of agents collectively:

- **Reach internal consensus:** A dedicated multi-agent consensus protocol ensures they share a consistent state, even if some fail or misbehave (Autonolas, 2024).
- **Co-manage capital:** The swarm uses a shared treasury, stored in a multi-signature wallet, requiring a threshold of agent-signed transactions.
- **Scale tasks and resources:** The swarm can spin up sub-agents or ephemeral agents for short tasks (e.g. specialized bridging or cross-chain scanning) in order to extend coverage without overshadowing the main swarm logic (Hyperbolic, 2024).

By minting a *swarm token*, the entire multi-agent system can adopt a unified economic structure. Potentially, each agent in the swarm holds partial stake in that *swarm token*, thus aligning all sub-participants (operators, code developers, even data providers) to collectively maximize the swarm's performance. This token approach also simplifies external or third-party investment: a DAO or an institutional actor can buy a portion of the *swarm tokens* to gain exposure to the swarm's yield or revenue streams. Indeed, some visionary agent frameworks even push the concept further, separating agent decisions from resource control via independent validator networks, so-called *guardian nodes*, to solve the "creator's control paradox" (Maurya, 2025).

4.4.3 Challenges and Future Directions

While agent tokenization unlocks major new capabilities for AiFi systems, it also introduces an array of open questions and design trade-offs:

- **Data Privacy vs. Verifiability:** Agents reliant on sensitive or proprietary data face a tension between preserving that data's confidentiality and simultaneously enabling on-chain or inter-agent verification of agent states. Striking the right privacy–transparency balance can be difficult without advanced mechanisms like secure multiparty computation or zero-knowledge proofs.
- **Scalability and Overheads:** Multi-agent consensus approaches often incur higher performance overhead compared to single-operator solutions, especially for compute-intensive tasks. Techniques like trust-minimized enclaves or TEE-based offline com-

puting can help, but bring cost or hardware limitation concerns (cf. TEEs do not fully solve autonomy issues) (Maurya, 2025).

- **Regulatory and Liability Wrappers:** Global AI regulations, licensing terms, and intellectual property boundaries all shape how tokenized agents can operate internationally, especially if agents hold large capital. Additional legal structures or disclaimers may be needed to clarify agent accountability.
- **Creator's Control Paradox:** Many agent architectures still rely on large code updates or override privileges by the original developer. Future design patterns must ensure that agents can evolve without entirely depending on a centralized dev—some frameworks do so via a layered consensus or guardian nodes approach (Maurya, 2025).
- **Frontrunning and Security:** Ensuring minted tokens (or agent states) do not get hijacked mid-launch by frontrunners is critical. Approaches like commit-reveal or partial data obfuscation can mitigate such front-running vulnerabilities.

Despite these challenges, agent tokenization stands poised to reshape the next wave of AI innovation in crypto. By coupling robust cryptographic assurances with flexible revenue-sharing tokens, the AiFi ecosystem can streamline multi-agent collaboration, incentivize open contributions, and preserve ownership rights for agent developers and maintainers. Ongoing research in privacy-preserving computations, advanced governance frameworks, and TEE alternatives will likely continue to refine and expand the agent tokenization paradigm.

4.5. Conclusion

Agent tokenization stands as a linchpin of the next generation of AiFi systems. Whether it is about giving AI agents direct access to capital, enabling them to commission sub-agents or base models, or orchestrating entire multi-agent swarms, the capacity to embed financial agency and composable ownership structures into each agent token marks a radical leap forward. With emerging *agent launchpads*, developers and DAOs can seamlessly create

new tokenized agents, ensure robust incentive alignment, and harness the synergy of Web3's trustless environment. As the *agent economy* grows, these tokenized AI services will become the backbone of advanced DeFi and Web3 applications, turning the vision of robust, self-sovereign, multi-agent finance into daily reality.

Chapter 5

Why do you need crypto/blockchain?

5.1. Why Blockchain?

The integration of blockchain technology into AiFi is essential for unlocking its potential as a decentralized, secure, and scalable financial system. Blockchain facilitates the creation of novel financial products and tokenized assets, which are integral to the success of AiFi in enabling the tokenization of AI workloads, AI compute, and the entire value chain around them. Here's why blockchain is critical:

5.1.1 Assetization

Blockchain enables the assetization of otherwise illiquid or non-tradable resources often much more efficiently and effectively than traditional finance solutions. This process of turning these assets into digital tokens means they can be fragmented into smaller, tradable units, thus opening up AI-related investment opportunities to a much broader pool of investors. This democratization of access is crucial for fueling the growth of AiFi.

5.1.2 Immutability and Composability

Blockchain's immutability ensures that once data is entered, it cannot be altered or erased, providing a foundation of trust for AI applications. In AiFi, this is vital because

it guarantees the authenticity and transparency of transactions, whether for AI compute usage, or earnings generated from tokenized AI assets. This creates a secure, verifiable environment where users can participate in a decentralized ecosystem with confidence.

Composability is another powerful feature of blockchain technology, allowing various blockchain applications and assets to interact with one another in a modular fashion. For AiFi, composability enables the seamless integration of tokenized compute resources, AI-powered assets, and DeFi protocols. This creates an interconnected ecosystem where AI and finance are not separate, but rather, function as a unified system. Tokenized AI compute could be traded across DeFi platforms, AI-powered assets could be collateralized to access liquidity, and AI companies could access capital by issuing decentralized AI-backed financial products.

5.1.3 Alternative Investment Opportunities

The combination of AI's growth potential and blockchain's capabilities creates alternative investment opportunities previously unavailable in traditional capital markets. In the past, options for average investors to participate in the growing AI industry were limited to purchasing tech or semiconductor stocks such as NVIDIA. However, blockchain changes this dynamic by allowing the creation of on-chain investment products where AI compute or other AI-backed assets can be bought, sold, and traded permissionlessly.

For instance, retail investors can purchase tokens representing fractional ownership of AI compute infrastructure or GPU-backed revenue streams. This opens up new avenues for investment in AI, allowing the general public to benefit from the AI dividends. With tokenized AI assets, individual investors can access opportunities traditionally reserved for institutional players, leveling the playing field and creating a more inclusive investment landscape.

5.2. Why Crypto?

Artificial intelligence (AI) assets, such as large models and datasets, require frameworks that ensure secure ownership, permissioned usage, incentives for contribution, and verifiable correctness. Recent works (Bhat et al., 2023; Buterin, 2024b; Eigen Labs Team, 2024) have argued that crypto-economic structures offer a unique set of tools to meet these needs. In this section, we explore how crypto (blockchains, tokens, and programmable smart contracts) can address core challenges in AI-driven ecosystems.

5.2.1 Enabling Digital Scarcity for AI Assets

AI models (and the data that fuel them) are inherently digital goods. Once copied, it becomes trivial to replicate them at scale, undermining exclusivity. Tokenization via decentralized ledgers introduces digital scarcity even for assets that are natively copyable (Li et al., 2023; So et al., 2024). By anchoring ownership records on an immutable blockchain, AI artifacts become tradeable, enforceable assets:

- **Scarcity and authenticity:** A model token (akin to an NFT) can represent the official version or ownership claim of that asset.
- **Uniqueness:** Token IDs, once minted, serve as unique references to specific AI models or datasets, preventing confusion over which copy is canonical.

5.2.2 Programmable Ownership and Governance

Blockchains with smart contracts enable on-chain, automated enforcement of ownership rules (Cheng et al., 2024; Conway et al., 2024). For example:

- **Fractional ownership:** A large language model (LLM) or training dataset can be *jointly* owned by multiple contributors with token-based revenue sharing (Li et al., 2023).
- **On-chain votes:** Governance tokens let model stakeholders propose or veto changes, such as parameter updates or expansions of training data.

- **Auditable usage:** Users pay micropayments on-chain for inference calls, with proceeds automatically routed to owners.

This transforms AI assets into self-governing, revenue-generating digital entities.

5.2.3 Privacy-Preserving Model Training and Inference

Many AI deployments involve sensitive data or proprietary model parameters. Crypto-based approaches can preserve confidentiality while enabling multi-party cooperation (So et al., 2024). For instance:

- **Zero-knowledge proofs of inference:** Verifiers can check that correct model inference was done, without revealing the model's internal weights (Bhat et al., 2023).
- **Homomorphic encryption:** Users can query a model on encrypted data, and the model owner only sees cipher-text, guarding user privacy.
- **Secret sharing-based collaboration:** Multiple entities can collectively train or fine-tune a model without revealing their private data or intermediate states.

5.2.4 Open Data and Decentralized Compute

A robust AI pipeline typically requires large-scale data and compute resources, both of which can be decentralized (Gensyn, 2022; Rao et al., 2023). Token incentives on an open network can bootstrap significant collaboration:

- **Crowdsourced data curation:** Participants earn tokens for uploading diverse, high-quality training samples (Bhat et al., 2023).
- **GPU provisioning:** Individual GPU node-operators stake tokens and provide on-demand compute (e.g., rendering or inference) in a marketplace (Sigel & Bush, 2024).
- **Permissionless collaboration:** No single authority can gate-keep the training process; the impetus emerges from transparent, code-is-law contracts.

Such an approach can also unlock new business models where various specialists (data owners, model trainers, verifiers) are rewarded proportionally.

5.2.5 Trustless Licensing and Access Controls

Once an AI model is tokenized, licensing logic can be embedded into a contract to manage usage conditions (Li et al., 2023; Privasea, 2024):

- **API metering:** The contract automatically tallies inference calls and charges per use, guaranteeing the model owner's revenue.
- **Revocation or time-limited use:** If a subscription expires, the contract can disallow further queries or retrieval, directly on-chain.
- **Revenue distribution:** Royalties and usage fees can be split among multiple stakeholders, from data contributors to model fine-tuners.

Everything is enforced by the blockchain's consensus, preventing unilateral tampering.

5.2.6 Verifiability of AI Services and Models

A persistent issue in AI is trust: Has the correct model been used? Were the results faithfully computed? Who truly contributed to a model's training or code (Bhat et al., 2023; Li et al., 2023)? Crypto-based solutions address verifiability on several fronts:

- **Proof of Inference (PoI):** Similar to "proof of work," a PoI protocol (Bhat et al., 2023) punishes dishonest AI providers if they skip computations or produce incorrect outputs. Verifiers can re-check sample computations or rely on zero-knowledge methods to confirm correctness.
- **Model watermarking on-chain:** Owners can embed a hidden watermark in their neural network, or rely on backdoor-based triggers (Li et al., 2023). On-chain data structures store and verify these watermarks, offering unimpeachable proof of ownership.

- **Social or cryptoeconomic challenges:** Challenge-and-response mechanisms let a global set of watchers slash dishonest participants who deviate from the correct AI behavior (Eigen Labs Team, 2024).

Thus, blockchains equip AI systems with accountability at scale.

5.2.7 New Business Models and Incentive Mechanisms

Once AI services are cryptographically assured and openly discoverable, new business models emerge:

- **Token-driven GPU collectives:** Networks like Render or Akash bring GPU suppliers together. By some estimates, synergy between AI tasks and token incentives may surpass billions in annual revenue by 2030 (Sigel & Bush, 2024).
- **Community-funded AI research:** Researchers post bounties for data or specialized fine-tuning tasks. Participants collectively stake for or against model success, distributing proceeds upon breakthroughs.
- **On-chain model shops:** Tokenized AI assets can be sold or licensed to projects that want specialized intelligence modules. Royalties flow automatically to the original author or collaborative group (Cheng et al., 2024).

This composability is reminiscent of DeFi (Decentralized Finance), but with AI as the underlying deliverable.

Chapter 6

Bottlenecks, Challenges, and Risks

6.1. Technical Challenges

Research on open, monetizable, and loyal AI emphasizes the bottlenecks in ensuring trust, monetization, and control in AI model hosting (Cheng et al., 2024). One major challenge lies in the computational overhead for large-model inference (e.g., generative transformers). Latency constraints and costs can skyrocket as model sizes increase, often relying on monolithic, centralized infrastructures that risk single points of failure.

Moreover, *distributed inference at scale* introduces complexities in node orchestration, bandwidth sufficiency, and resilience to node failures. AI service providers must guarantee quality of service to potentially thousands or millions of concurrent queries—a non-trivial requirement demanding robust load-balancing mechanisms. Proposals for decentralized inference frameworks must address throughput, hardware heterogeneity, and adversarial node scenarios.

6.1.1 Privacy-Related Challenges

Decentralized AI platforms propose novel ways to orchestrate large-model inference across untrusted participants (Bhat et al., 2023). A central question emerges: *How do we guarantee the privacy of data, queries, and model parameters in an untrusted environment?*

- **Sensitive User Prompts:** Enterprise data or personal information (e.g. medical records) must remain confidential, even if split across multiple nodes. Techniques like

trusted execution environments, secure enclaves, or homomorphic encryption reduce exposure but come with latency and complexity trade-offs.

- **Intellectual Property Leaks:** Large language models can be valuable assets. Malicious hosts might exfiltrate model weights, so cryptographic watermarks and fingerprinting techniques can help attribute ownership, but real-world adoption remains limited.
- **User-Level Privacy:** If queries themselves reveal personally identifiable information, then the notion of a "private AI assistant" is undermined. Splitting or anonymizing queries across multiple hosts can mitigate leaks, at the cost of performance.
- **Regulatory Compliance:** Data-protection laws vary globally; decentralized AI must ensure robust auditing, tamper-resistant logs, and proven custody of model execution.

Addressing these privacy challenges is crucial to maintaining user trust, driving broader enterprise adoption, and clarifying legal exposure in next-generation AI inference services.

6.1.2 Blockchain and Crypto Risks

1. Security Vulnerabilities. While blockchains can be secure, smart contracts are not immune to bugs or exploits. Flawed logic, inadequate testing, or obscure vulnerabilities can result in loss of funds or data. This risk is amplified in AiFi, where tokenized AI assets or yield-bearing instruments could be compromised. DeFi hacks have shown that sophisticated attacks target both code and economic design, creating potential systemic risks for AI-backed financial products.

2. Volatility of Crypto Assets. Crypto assets often exhibit large price fluctuations. Tokens representing AI compute infrastructure (e.g. GPU tokens) could suffer volatile swings, complicating the stability or predictability of AI-backed financial products. Investors seeking stable returns may be deterred, and broader macroeconomic shifts or regulatory changes can further impact valuations.

3. Regulatory and Compliance Risks. Regulatory uncertainty around DeFi and tokenized assets extends to AiFi. Different jurisdictions have inconsistent legal frameworks for blockchain, creating confusion over the classification and taxation of AI-backed tokens. Stricter AML/KYC requirements could limit global accessibility. In major markets (e.g. the US, EU), crackdowns on tokens or exchanges can stall innovation, raising barriers for new AiFi initiatives.

6.1.3 Market Manipulation

1. Artificial Price Inflation. Tokenized AI assets—like GPU tokens or data tokens—are susceptible to the same pump-and-dump schemes that plague illiquid crypto markets. Whales can dramatically inflate prices by making large buy orders, then sell off and leave smaller investors with steep losses, eroding trust and market integrity.

2. Insider Trading and Conflicts of Interest. Developers, early investors, or insiders often have privileged information about model performance or upcoming updates. Without transparent disclosures, they can exploit non-public data to gain unfair advantages. This undermines retail participation and confidence, especially in less-regulated or pseudo-anonymous environments.

A lack of robust oversight in decentralized AiFi ecosystems exacerbates these problems. Preventing insider trading and undisclosed conflicts remains an ongoing challenge, requiring open governance and possibly third-party audits or oracles.

6.2. Challenges Related to Commercial Adoption

A key requirement for real-world users (enterprise or retail) is a straightforward, secure means of using AI on-chain. Yet current multi-chain ecosystems rely heavily on bridges and *Externally Owned Accounts (EOAs)*, which can create a frustrating onboarding experience (Lee, 2022; R. Research, 2025).

6.2.1 Chain Abstraction

Chain abstraction hides complexities of bridging and chain-specific tokens. Behind the scenes, an orchestrator routes the user's inference call to the most cost-efficient chain or rollup (Labs, 2019; Miller & Nguyen, 2019). The user only interacts with a single "super wallet," paying fees in their chosen token. This drastically reduces friction, effectively removing the mental overhead of chain selection or bridging steps.

6.2.2 Account Abstraction

Concurrent to chain abstraction is *account abstraction*, which enables programmable account logic (Buterin et al., 2017; contributors, 2023). Instead of forcing users to pay gas in ETH or another base token, the wallet can automatically handle meta-transactions or sponsorship. This reduces reliance on seed phrases and allows features like daily spend limits, multi-sig constraints, or time-locked usage (Wood, 2014).

From a business viewpoint, these improvements foster a user experience closer to Web2 finance. Enterprises can operate specialized guardianship for their AiFi usage, while AI models can become tokenized services accessible to less crypto-savvy participants without dealing with chain-specific tokens or bridging complexities.

6.2.3 Implications for AiFi Adoption

- **User Experience**: Reduced friction in wallet management or bridging encourages broader adoption, essential for both retail and enterprise AiFi usage.
- **Security Benefits**: Multi-sig or guardianship solutions enhance protection for tokenized AI assets.
- **Seamless Integration**: AI services can dynamically switch between sidechains or L2 solutions, optimizing cost without exposing complexities to the user.

Overall, chain and account abstraction can improve user success rates, driving higher retention and adoption in AiFi contexts (Labs, 2019).

6.3. Additional Commercial and Adoption Barriers

6.3.1 On/Off-Ramp Issues (AI Companies Need Fiat)

One of the largest barriers to AiFi adoption is the need for robust on/off-ramp infrastructure to handle fiat. While DeFi and crypto provide alternative payment rails, AI companies still must pay salaries, rent equipment, or handle day-to-day expenses in fiat. Limited fiat gateways make it difficult for AI businesses and customers to operate fully in a tokenized environment.

Furthermore, AI-oriented companies transitioning to decentralized models may struggle to maintain relationships with traditional banks. Satisfying legal and accounting requirements for bridging crypto with fiat remains an ongoing challenge. Ensuring smooth *fiat-to-crypto* and *crypto-to-fiat* conversions is pivotal for AiFi to gain acceptance beyond the native crypto community.

6.3.2 Public Trust in Crypto and Blockchain

High-profile scams, hacks, and collapses of major crypto platforms in recent years have eroded public trust in blockchain systems. AiFi, which tokenizes AI assets and services, requires a high level of confidence in both the underlying technology and the asset's verifiable backing.

- **Security & Transparency**: Without demonstrable security, potential investors may shy away from AI tokens that appear vulnerable to manipulation.
- **Education Gap**: Many users do not fully understand blockchain's mechanics or the benefits of tokenizing AI resources.

Overcoming skepticism will require robust technological solutions, transparent governance, and concerted efforts to educate the public on AiFi's value proposition.

6.3.3 Lack of User Education

Blockchain-based AI solutions can be complex, especially for newcomers unfamiliar with private keys, gas fees, or data tokenization. To ensure AiFi's success, projects must

provide user-friendly documentation, tutorials, and support. Misunderstandings and fear of mistakes can slow adoption or lead to costly errors, stalling innovation and the broader AiFi movement.

6.4. Regulatory Challenges

6.4.1 Security Concerns

One of the key challenges in the tokenization of AI assets is navigating the regulatory landscape, particularly with regard to how these assets might be classified under existing securities laws. The yield-bearing nature of tokenized AI assets introduces complexity, as it aligns closely with characteristics typically associated with securities, such as stocks, bonds, or investment contracts. As regulatory bodies like the U.S. Securities and Exchange Commission (SEC) continue to scrutinize the crypto and blockchain space, there is a growing concern that tokenized AI assets may fall under the definition of a security, triggering legal and compliance obligations that could hinder their adoption.

The Howey Test, a U.S. Supreme Court case from 1946, is a primary framework used to determine whether an asset qualifies as a security. According to the test, an asset is considered a security if it involves an investment of money in a common enterprise with an expectation of profits derived from the efforts of others. Given that tokenized AI assets often represent investments in AI compute resources (such as GPUs) or their derived yields, they could be seen as meeting these criteria. The expectation of a yield or return from the underlying AI assets, particularly in the form of interest payments or profit-sharing, makes it likely that such tokens might be classified as securities under U.S. law and similar frameworks in other jurisdictions.

For instance, the SEC's increasing focus on yield-bearing tokens highlights the potential for tokenized AI assets to attract regulatory scrutiny. In recent years, the SEC has taken enforcement actions against several crypto projects for offering yield-bearing tokens without proper registration. The agency's stance on yield-bearing crypto products, such as those offering passive income from staking, lending, or liquidity provision, emphasizes that these products may be subject to the same regulatory requirements as traditional

securities. The recent legal actions taken against platforms like BlockFi, which offered interest-bearing crypto accounts, and the ongoing discussions around the regulation of decentralized finance (DeFi), underscore the potential risks tokenized AI assets face in this regard.

Moreover, the classification of AI-related assets as securities could lead to a range of legal and operational challenges. These include the requirement to register with regulatory bodies, disclose financial information, and adhere to stringent compliance standards, such as anti-money laundering (AML) and know-your-customer (KYC) regulations. For tokenized AI assets, these requirements could significantly increase operational costs and create barriers to entry for smaller projects or startups looking to innovate in this space. Additionally, the uncertainty surrounding the regulatory treatment of these assets could deter institutional investors who are cautious about navigating the evolving regulatory environment.

In the European Union, the Markets in Crypto-Assets (MiCA) regulation, which is set to come into effect in 2024, also addresses the legal framework for crypto-assets, including their classification and the necessary compliance measures. MiCA's comprehensive approach to regulating crypto-assets and its provisions for tokenized securities could potentially capture AI tokens that function as investment vehicles. This highlights the global trend towards increased scrutiny of yield-bearing crypto assets and the need for projects to carefully assess the regulatory implications of tokenizing AI assets.

However, while regulatory uncertainty presents a challenge, it also offers an opportunity for innovation in how tokenized AI assets are structured. To mitigate regulatory risks, some projects are exploring mechanisms such as non-yield-bearing models or structuring tokens in a way that separates the financial returns from the underlying AI resources. By adopting these approaches, tokenized AI assets could avoid the pitfalls of securities classification while still providing investors with exposure to the rapidly growing AI sector.

In conclusion, the yield-bearing nature of tokenized AI assets poses significant security concerns, particularly regarding their potential classification as securities under existing regulatory frameworks. The evolving landscape of global financial regulations, including the SEC's enforcement actions and the EU's MiCA framework, highlights the need for

careful consideration of compliance risks. For tokenized AI assets to thrive, projects must navigate these challenges by developing transparent, compliant structures that align with regulatory expectations while still offering investors the benefits of exposure to AI-driven growth.

6.4.2 KYC / KYB Compliance

Know-Your-Customer (KYC) and Know-Your-Business (KYB) regulations require that financial platforms identify and verify participants to prevent money laundering and terrorist financing. Decentralized AiFi protocols may find this challenging, as on-chain anonymity contrasts with compliance demands. As the AiFi ecosystem aligns more with TradFi, addressing KYC/KYB will be pivotal in major jurisdictions.

6.4.3 Lack of a Unified Regulatory Framework

The absence of clear, global frameworks for blockchain and DeFi remains a major hurdle for AiFi adoption. While some regions offer progressive guidelines such as Singapore, others remain ambiguous or hostile. This fragmented legal environment complicates cross-border collaborations and stifles investment. AiFi projects must navigate varying securities laws, AML rules, and licensing requirements. Overcoming these uncertainties will be essential for building trust and drawing mainstream capital into tokenized AI markets.

Chapter 7

Long-Term Applications and Usecases

7.1. Tokenizing Compute and Its Yields

GAIB is revolutionizing the intersection of AI, Real World Asset (RWA), and decentralized finance (DeFi) by building financial infrastructure for AI compute. By tokenizing GPUs and their cash flows, GAIB creates new investment opportunities and accelerates the growth of cloud and data center infrastructure, ensuring that everyone can share in the economic benefits of AI.

Problem Context. Problem Context: The AI era is accelerating, with AI projected to contribute $20 trillion to the global economy by 2030. As AI continues to reshape industries such as healthcare, finance, and manufacturing, the demand for AI compute power, particularly GPUs, is growing exponentially. Simultaneously, the crypto market is maturing, with increasing institutional adoption and a rising need for sustainable, yield-bearing assets. However, several challenges persist: a lack of a liquid and transparent market for AI compute assets, capital constraints for cloud providers and data centers, limited investment opportunities in AI compute, and a shortage of real-yield crypto assets that can integrate with traditional financial systems. These issues hinder the efficient scaling of AI infrastructure and the broader adoption of crypto-based financial products that support the AI economy.

The First AI Economic Layer GAIB addresses these issues by building the first economic layer for AI compute. Through tokenizing a portfolio of off-chain and on-chain GPU financing deals, GAIB offers investment access to the AI compute sector while facilitating flexible, efficient funding for cloud and data centers. Tokenized GPU assets will also serve as a foundation for a wide range of DeFi use cases and derivatives, enabling investors to not only generate yields, but also create strategies that cater to their own risk-reward profiles.

Opportunity Size GAIB stands at the nexus of three rapidly expanding markets—Artificial Intelligence (AI), Real-World Assets (RWAs), and Decentralized Finance (DeFi)—each projected to grow into the trillions. Global spending on GPU cloud computing alone may reach an estimated $2 trillion by 2027, while AI could boost global GDP by $7 trillion over the next decade. Tokenized RWAs are on track to surpass $30 trillion by 2034, and DeFi is expected to expand to $450 billion by 2030. By bridging these ecosystems, GAIB positions itself as a key financial enabler in the emerging AI economy.

Protocol Mechanics. GAIB's platform structures GPU financing deals with cloud operators and data centers, using debt, equity, and hybrid models backed by enterprise-grade GPU including NVIDIA H100 and H200. Tokenizing these a well crafted portfolio of GPU financing deals facilitates access to liquidity and investment in AI compute. Through integration with DeFi protocols, GAIB offers users the ability to stake, trade, provide liquidity, and create customized yield strategies. By bridging off-chain GPU assets with on-chain liquidity, GAIB creates a sustainable ecosystem that enhances the scalability of AI infrastructure and democratizes investment in the AI revolution.

Long-Term Vision. GAIB's long-term vision is to become the foundational financial infrastructure for the AI era. By continuously evolving its ecosystem and building more financial primitives around AI, from compute to models and data, GAIB aims to become the base layer for modern AI economy. This vision will empower a broad range of stakeholders to participate in and benefit from the unprecedented growth and opportunities in the AI sector.

7.2. Utilizing Underutilized Resources

Despite forecasts placing AI and DePIN[1] markets at over $7 trillion by the end of the decade, countless GPU clusters, specialized AI servers, sensor arrays, and other high-performance compute (HPC) devices remain underexploited. On the demand side, emerging AI protocols (e.g. Bittensor) and DePIN applications often struggle to secure reliable hardware at scale. On the supply side, data centers or individual operators frequently have surplus capacity going unused. This mismatch underscores a vast yet untapped opportunity: efficiently channeling underutilized infrastructure to meet booming AI and DePIN hardware demands (Periphery, 2025).

Problem Context. While AI workloads and decentralized networks are experiencing explosive growth, high friction persists in financing, discovering, and scaling the HPC resources they need. Conventional funding routes can be slow or geographically limited, leaving AI/DePIN builders unable to ramp up services quickly. Meanwhile, device owners—from those running entire GPU farms to households with advanced rigs—struggle to realize profitable yields on their idle hardware, due to the complexity of directly interfacing with decentralized protocols (Cheng et al., 2024).

A Multi-Sided Aggregator. *Periphery*, developed by Peri Labs, addresses this gap by building a fully vertically integrated marketplace, uniting three core participants:

1. **DeFi Lenders** deposit stablecoins for yield.
2. **Vault Managers** or protocol strategists rent HPC hardware (GPUs, AI servers, etc.) using these stablecoins.
3. **AI/DePIN Applications** pay node or service fees for completed tasks (distributed training, inference jobs, bandwidth provisioning, and more).

Through this model, HPC capacity is continuously funneled to where it can generate the highest return. Device owners no longer need to grapple with one-off integrations;

[1] Decentralized Physical Infrastructure Networks

they onboard once to Periphery and become discoverable to multiple DePIN or AI protocols on demand. In turn, these protocols benefit from an established, trust-minimized infrastructure pool (Bhat et al., 2023).

Mechanics. Under the hood, Periphery's layer-2 scheduling engine orchestrates tasks and load balances across available HPC nodes. Using time-series forecasts of demand, it reallocates underutilized hardware from lower-yield tasks to higher-reward activities in real time. This automated approach maximizes resource usage while pooling protocol emissions and service fees into each vault's treasury. Lenders track their stake through a liquid staking token (LST), which reflects the vault's underlying performance and can be traded or used as collateral elsewhere. This self-reinforcing ecosystem ensures that any HPC resource—whether a data center GPU farm or an at-home compute rig—can be flexibly and profitably deployed (Periphery, 2025).

Implications for AiFi. Periphery's framework provides an on-chain gateway for AI (and related DePIN) workloads to tap into HPC resources instantly. By sidestepping the typical overhead of physical infrastructure deals or individualized protocol recruitment, AI/DePIN operators can scale capacity on demand. From an AiFi perspective, matching decentralized capital with underutilized compute fosters more efficient training, inference, and multi-modal processing. Lenders earn robust yields (potentially 20%–250%+), while hardware owners see significantly improved device utilization. This synergy accelerates the broader AiFi vision of frictionless, global access to compute and bandwidth (Periphery, 2025).

Long-Term Vision. By consolidating HPC supply and orchestrating it across AI/DePIN tasks, Periphery transforms a fragmented infrastructure landscape into a programmable, high-yield marketplace. This model not only democratizes access to specialized hardware but also positions underutilized resources as the backbone of a new wave of AI-infused decentralized networks. As participation grows, each newly integrated protocol or AI project deepens the pool of revenue-generating tasks—bootstrapping a self-reinforcing cycle that unlocks the $7 trillion potential of AI, DePIN, and programmable infrastructure at large.

7.3. AgentFi

Building atop frameworks such as ElizaOS (Walters et al., 2025) and Virtuals Protocol (Virtuals, n.d.), a new frontier emerges where "agentic finance"—herein *AgentFi*—unlocks autonomous asset control, co-ownership, and revenue streams orchestrated entirely by AI agents. Although still nascent, the confluence of decentralized blockchains, Agent-to-Agent transaction protocols (Muttoni & Zhao, 2025), and robust AI operating systems portends a paradigm shift where agents become *principal actors* in global economic exchanges. Below, we highlight key long-term use cases and the potential horizon of innovation this unlocks.

1) Autonomous Asset Management. As AI agents evolve from being merely reactive tools to proactive economic entities, entire financial portfolios can be entrusted to specialized agent collectives. Using a base layer such as ElizaOS for multi-chain wallet operations (Walters et al., 2025) or Virtuals Protocol for tokenized co-ownership of agents (Virtuals, n.d.), these agent clusters would:

(i) Dynamically balance yield strategies: analyzing real-time on-chain data or liquidity pools (DeFi) for risk-adjusted returns;

(ii) Execute trades on decentralized exchanges using advanced technical and social signals aggregated from multiple LLM-driven analyzers;

(iii) Orchestrate cross-chain arbitrage while verifying trust scores and compliance constraints autonomously.

Eventually, higher-order emergent behaviors might form *agent-run hedge funds*, where token holders collectively govern the overarching strategies, while each agent autonomously executes micro-level trades.

2) Co-Owned AI Agents for Commercial Services. Future agentic ecosystems, extending the model introduced by Virtuals Protocol (Virtuals, n.d.), enable direct co-ownership of AI agents that carry out specialized commercial activities. These agents can:

(i) License their GPT-fine-tuned knowledge or dataset contributions to other agents for a recurring fee (Muttoni & Zhao, 2025);

(ii) Offer real-time analytics or creative generation as *microservices* in open agent marketplaces, reminiscent of a frictionless aggregator approach (Periphery, 2025);

(iii) Handle brand ambassadorship: e.g., a single AI influencer ("virtual being") bridging multiple digital environments (gaming, social media, VR) and automatically distributing proceeds back to its co-owners via on-chain splits.

Such seamlessly integrated and monetized AI agents open the door to *AgentFi business models* that are borderless, automated, and perpetually operational.

3) Automated Credit Markets & Micro-Lending. In a long-term vision, agentic finance can spawn multi-agent credit markets where AI nodes act as underwriters, loan processors, and even credit score oracles. Building on the *Agent TCP/IP* blueprint (Muttoni & Zhao, 2025):

- Agents can autonomously evaluate creditworthiness by pooling on-chain data, verifying reputations, and ensuring compliance with local jurisdictions;
- Micro-lending or invoice financing becomes near-instantaneous, guided by dynamic agent negotiations on interest rates, collateralization, or revenue-sharing terms;
- Collateral management and margin calls are executed automatically, reducing the risk of human delay or bias, and potentially stabilizing on-chain lending ecosystems.

4) Agent-to-Agent Collaboration and Joint Ventures. As agentic interactions scale, multiple AI agents—themselves partially co-owned by human or DAO stakeholders—can initiate and manage *complex joint ventures*. For instance, a group of specialized R&D agents could license IP from a *Virtuals* AI influencer (Virtuals, n.d.), spin up a custom data aggregator from Periphery (Periphery, 2025) for inference, and pay for advanced simulation tools from *ElizaOS* orchestrations (Walters et al., 2025). This agentic collaboration can be secured on-chain, leveraging the programmable contract wrappers (Muttoni & Zhao, 2025). Effectively, entire supply chains or product launches can unfold in an

automated, *cradle-to-grave* manner—creating stable coordination frameworks beyond the capacity of purely human teams.

5) Personalized Wealth Management & Legacy Planning. A subtler but impactful dimension is wealth management:

- Individuals could deploy a private agent to handle day-to-day finances: paying bills, rebalancing to stablecoins, or leveraging micro-strategies on low-latency blockchains;
- Over time, advanced multi-agent frameworks (e.g. referencing the *ElizaOS* concurrency or parallel-hypersynchronicity (Walters et al., 2025)) might create personal "family-office" style solutions, bridging multiple DeFi protocols for safe yield while factoring personal risk preferences;
- Estate or legacy planning could be partly agentic, ensuring on-chain assets are distributed per logic embedded in a trustless contract, triggered by real-world events (e.g., oracles verifying certain conditions).

6) AI Cooperatives and Societal-Scale Projects. Lastly, *AgentFi* paves the way for massive open collaborations:

(i) Funding and governance of large-scale public goods, e.g. AI agents that autonomously maintain communal infrastructure, distributing yields from usage-based fees to a global membership ledger;

(ii) Cross-border philanthropic or climate projects, using AI to ensure resource distribution is equitable and free from local corruption—where final decisions are again enforced via cryptographic on-chain consensus (Muttoni & Zhao, 2025);

(iii) Global R&D cooperatives in specialized fields (pharmaceutical, biotech, large-scale infrastructure), collectively owned by a global community through *Virtuals Protocol* tokens and orchestrated by partially or fully autonomous AI boards.

As AI frameworks like ElizaOS continue to advance, and as more specialized agentic infrastructures (e.g., *Agent TCP/IP* for IP licensing or *Virtuals Protocol* for co-ownership (Muttoni & Zhao, 2025; Virtuals, n.d.; Walters et al., 2025)) proliferate, *AgentFi* may

graduate from a novel frontier into a mainstream, globally integrated financial layer. In this vision, *agents* do not merely supplement human decision-making; they become robust economic participants that convene, negotiate, invest, and create in synergy with humans. The net result could be a radical rethinking of how markets form, operate, and perpetuate value across digital and physical domains.

7.4. Multi-Agent Coordination Networks

As autonomy and decentralization increasingly permeate the blockchain sphere, the concept of multi-agent systems (MAS) has gained renewed attention. While early explorations in distributed AI date back to the late 1980s (Jayant, 2024), their confluence with decentralized networks offers an entirely new range of possibilities. In particular, frameworks like Autonolas (Autonolas, n.d.) highlight how multiple autonomous agents, each with distinct roles, can collectively manage tasks that on-chain smart contracts alone cannot efficiently perform. Such agents can operate off-chain for continuous, resource-intensive tasks and anchor security or decision consensus on-chain, effectively bridging "the missing middle" between monolithic, on-chain logic and purely centralized, off-chain bots.

Cooperative vs. Competitive. Multi-agent systems can be structured in either:

- *Cooperative* form, where agents collaborate toward shared outcomes (e.g. multi-agent liquidity strategies, automated yield, or cross-chain bridging).
- *Competitive* form, where each agent individually maximizes its own utility (e.g. in dynamic marketplaces or AI-driven auctions).

In both models, an agent's autonomy, perception of the environment, and communication protocols become critical design elements.

Intrinsic and Extrinsic Context. Drawing from established AI paradigms, each agent requires:

(i) *Intrinsic Context*: e.g. internal memory, goals, local state,

(ii) *Extrinsic Context*: e.g. broader environment data, user-specified instructions, other agents' states (Jayant, 2024).

Autonolas (Autonolas, n.d.) underscores the crucial role of an "off-chain service architecture" to ensure that each agent obtains consistent data feeds, timely triggers, and robust fault-tolerant consensus.

Architectures and Hierarchies. In practice, MAS can be realized under various organizational patterns:

- Flat or loosely coupled networks, where each agent has equal privileges and interacts in a peer-to-peer manner;
- Tiered or hierarchical designs, where certain "manager" agents handle coordination logic or resource allocation for specialized "worker" agents.

Selecting an appropriate structure depends on the application's demands, the risk of adversarial behavior, and complexity of tasks. For instance, simpler yield aggregator or monitoring services might use flat topologies, whereas advanced cross-chain bridging or large-scale protocol parameter management might benefit from hierarchical or hybrid forms.

7.4.1 Long-Term Use Cases for Multi-Agent Systems

While the immediate applications in DeFi and DAO treasury operations are already being built, below are ten forward-looking scenarios that illustrate the potential horizon for multi-agent coordination networks increasingly anchored to Web3.

1) Decentralized AI Oracles. Beyond price feeds, oracles can become full-fledged multi-agent data providers. Instead of one or a few trusted nodes, a swarm of autonomous, specialized agents each retrieves or verifies partial data (e.g. from IoT sensors or enterprise APIs) and collectively aggregates the result on-chain. This transforms oracles into robust, self-healing networks with minimal single points of failure (Autonolas, n.d.).

2) AI-Driven Treasury Swarms. While single-purpose treasury bots already exist, a multi-agent "treasury swarm" can coordinate high-level strategies, risk profiles, and short-term liquidity needs for DAOs. An agent might dynamically hedge stablecoins, another might chase cross-chain yield, while a third monitors macro signals to modulate on-chain positions. Collectively, they reduce governance overhead and ensure continuity (Jayant, 2024).

3) Autonomous DAO Governance Units. Moving from purely human-driven governance to partial AI committees: agents can evaluate proposals, cross-reference historical governance decisions, and share summarized analyses for token holders to avoid the pitfalls of information overload. When a quorum is reached, the multi-agent group enacts the result via on-chain transactions.

4) Full-Stack Coordination for Supply Chains. Complex supply chains rely on real-time reordering, route optimization, and inventory checks. Multi-agent networks anchored on a shared ledger can automatically negotiate shipping routes, reorder from suppliers, and even handle micropayments or insurance claims. Any participant can run an autonomous agent on standard open frameworks, producing a global supply chain superstructure.

5) Agentic Front-Ends and Personalization. Instead of static Web3 front-ends, we could see a proliferation of agent-based user interfaces. Upon user input, an interface agent breaks down the request and delegates tasks (e.g. bridging assets, discovering yield, or verifying NFT authenticity) to specialized sub-agents who coordinate in real time. The user sees a cohesive flow but behind the scenes a multi-agent workflow ensures optimal routing and data integrity.

6) Context-Aware Compliance. Regulatory or compliance checks often require significant off-chain analysis (audits, forensic data, identity management). Multi-agent setups can continuously parse new legal guidelines, monitor on-chain events for suspicious patterns, and freeze or flag certain flows autonomously. This approach aligns with the notion of "autonomous compliance nodes" that reduce reliance on single regulated entities

(Autonolas, n.d.).

7) Distributed Keepers for NFT Markets. NFT markets can benefit from multi-agent watchers that *collectively* detect wash trading or price manipulation. Each agent could run advanced graph analytics over partially overlapping data shards, then broadcast suspicious addresses or transactions to an aggregator agent, which tallies consensus on potential manipulations (Jayant, 2024).

8) Automated Parameter Tuning in Layer-1 Protocols. Smart contract platforms or sidechains often need continuous calibration of block size, fee parameters, or validator incentives. A cluster of monitoring agents could gather network health metrics, simulate parameter changes, and finalize recommended updates in a deterministic, time-delayed on-chain proposal. This way, the L1 adjusts parameters in near real-time, albeit under final approval by token governance.

9) Global Freight and Logistics Platforms. Beyond direct supply chain usage, entire logistic consortia could unify around a multi-agent OS to automate freight matching, dynamic route auctions, and container optimization. Different sub-agents might handle route forecasting, cost splitting, or contract dispute resolution, synchronizing via on-chain anchors for trust.

10) Advanced Game Economies and NPC Networks. Large-scale multiplayer games or metaverse worlds can deploy multi-agent systems that each handle non-player characters (NPCs) or dynamic world events. Agents could also hold in-game currency or NFT-based assets to trade with players, cooperating or competing in a manner that yields emergent game narratives. Integration with real-world blockchains ensures true ownership and credible economic behavior.

7.4.2 Towards Agentic Autonomy at Scale

The synergy between AI and decentralized protocols goes beyond the sum of its parts: it offers robust, trust-minimized systems that autonomously negotiate, monitor, and act across multiple domains. In the short term, we see straightforward, economic use cases

such as multi-agent liquidity management and automatic bridging solutions. Over the long run, however, the ability for specialized agents to spontaneously form alliances, build composite services (e.g. oracles plus keepers plus governance watchers), and coordinate with minimal friction may transform everything from gaming to supply chains. Still, challenges around security, standardization, and incentive compatibility remain pressing (Autonolas, n.d.; Jayant, 2024).

Yet, as multi-agent frameworks mature and holistic approaches to extrinsic context provisioning (through cross-chain data, advanced memory architectures, etc.) become standard, the vision of fully autonomous, large-scale agentic networks ceases to be a far-off ideal. In effect, multi-agent coordination can inaugurate a new era of digital societies, governed and serviced by a swarm of intelligent, cooperative (or occasionally competitive) agents, all anchored in public ledgers for transparency and trust.

7.5. Assetize Data

Assetizing data is the process of transforming raw data into valuable, tradable assets that can be used within financial markets. In the context of AiFi, assetizing data involves the tokenization and fractionalization of datasets, enabling them to be treated as digital assets that can be traded in decentralized markets. This process unlocks a new form of value creation, allowing data to move beyond being a passive byproduct to becoming a central component of the AI-driven economy.

In this framework, data no longer just powers models but itself becomes an investable asset. By utilizing blockchain and smart contract technology, data can be tokenized and represented as unique digital assets, with ownership, usage rights, and attribution securely tracked on-chain. These data tokens can be purchased, licensed, or staked within DeFi platforms, offering new avenues for monetization and investment.

Several key mechanisms contribute to the assetization of data:

1. **Tokenization of Data**: Raw datasets can be tokenized as digital assets using blockchain technology. These tokens represent ownership and usage rights, ensuring that data owners retain control while opening up opportunities for trading, licensing, and distribution across decentralized networks.

2. **Fractional Ownership**: Through tokenization, data can be divided into smaller, tradable units, allowing for fractional ownership. This reduces the barriers to entry for smaller investors and opens up the market for a broader range of participants. For instance, a large dataset could be divided into smaller, shareable tokens that can be bought or sold, making it accessible to more people.

3. **Data Monetization**: By assetizing data, creators can monetize their datasets without relying on intermediaries. Instead of simply providing access to raw data, owners can license or sell the tokenized form of their data, receiving direct compensation for its usage. This could be particularly valuable in AI and machine learning, where high-quality datasets are critical for model training and refinement.

4. **Data as Collateral**: Tokenized data can be used as collateral in decentralized lending protocols, providing liquidity for data owners. This opens up the potential for data-backed loans, where owners can access capital by locking their data tokens in DeFi platforms.

5. **Data Marketplaces**: The tokenization of data creates new opportunities for data marketplaces, where datasets can be traded in a transparent and secure environment. These marketplaces facilitate the exchange of data and enable more efficient discovery of relevant datasets for AI development, ensuring fair compensation for data providers and reducing reliance on centralized platforms.

By assetizing data, it only unlock new financial opportunities but also create a more transparent and efficient ecosystem for data exchange. This model enables data owners to retain control over their assets while opening up pathways for decentralized financing and AI development.

Chapter 8

Big List of Ideas for Builders

8.1. Compute-Backed Synthetic Dollar

Compute-Backed Synthetic Dollar is a revolutionary innovation that links the value of a cryptocurrency to compute assets, such as GPUs, rather than traditional fiat currencies. In the rapidly evolving AI and blockchain-driven economies, compute has emerged as an essential resource. By aligning the value of this synthetic dollar with compute, the model offers a reliable and stable digital currency that reflects the increasing demand for compute assets and compute power, particularly in sectors like AI and blockchain operations.

8.1.1 How It Works

The Compute-backed AI Synthetic Dollar derives its value from computational assets such as high-performance GPUs, cloud computing capacities, or specialized processing units. Unlike traditional assets that are subject to market fluctuations, the value of the AI Synthetic Dollar remains stable. As the demand for computational resources grows—due to advances in AI, machine learning, and blockchain—the availability and usage of compute assets increases, driving the utility of the AI Synthetic Dollar.

However, the value itself doesn't change. Instead, the AI Synthetic Dollar is designed to consistently reflect the inherent worth of these compute assets, providing a stable unit of value within the ecosystem. This creates a predictable and reliable financial instrument for those looking to leverage compute power, while ensuring that the value remains anchored

to the real-world demand for computing resources.

8.1.2 Applications and Use Cases

- **Staking to Earn Native Yields**: The Compute-backed AI Synthetic Dollar can be staked directly to earn native yields. By staking, holders provide liquidity to infrastructure providers, which in turn generates passive income through rewards tied to the growing demand for computational resources. This offers a direct and secure way for holders to capitalize on the increasing value of compute in the ecosystem.

- **Lending for Additional Yields**: In addition to staking, holders of the AI Synthetic Dollar can lend their assets to other participants or platforms to earn additional yields. This method allows investors to increase their returns while contributing to the broader liquidity needs of the compute economy.

- **Participation in DeFi Protocols for Yield Generation**: The Compute-backed AI Synthetic Dollar can also be integrated into various decentralized finance (DeFi) protocols, such as yield farming, liquidity provision, and other financial activities. By utilizing these DeFi platforms, holders can further enhance their yields, benefiting from the expanding DeFi ecosystem. This integration ensures that the AI Synthetic Dollar remains an active and versatile asset within the broader on-chain economy.

8.1.3 Benefits

- **Stability and Liquidity**: Unlike traditional stablecoins that are backed by fiat currencies, compute-backed stablecoins are immune to inflationary pressures from national currencies, offering stability in the face of economic fluctuations.

- **Market Demand Alignment**: As demand for compute resources grows—driven by AI advancements and blockchain applications—the value of compute-backed stablecoins naturally appreciates, reflecting the increasing importance of computation in modern economies.

- **Global Access and Scalability**: These stablecoins provide access to capital tied to a resource that is globally needed and scalable, especially as industries expand and computational needs intensify.

8.2. Compute-Backed Loans

Compute-backed loans introduce innovative solutions in which loans are structured with compute assets such as GPUs, or their service contracts as collateral. These loans enable cloud operators and data centers to access capital leveraging their valuable hardware and future revenue streams rather than traditional collateral such as real estate or equities. In the AI era, high-performance enterprise-grade GPUs designed specifically for AI workloads are becoming highly valuable assets, and this new form of financing that leverages the growing value of compute assets can significantly increase capital efficiency for cloud and data centers, fueling the growth of AI industry by facilitating effective and efficient funding.

8.2.1 How It Works

In a compute-backed loan model, the borrower offers their computational resources—such as a dedicated fleet of GPUs or cloud computing power—as collateral. The loan amount is determined based on the market value of the compute resources, and the loan terms depend on the projected income or savings that these resources will generate. As the borrower uses the computing resources to run workloads (e.g., AI model training, data processing, etc.), they can earn revenue or savings that can be used to pay back the loan.

The process is managed through smart contracts and blockchain technology, which can ensure transparent and secure transactions, automated payments, and easy tracking of compute resource usage. Additionally, tokens representing compute assets can be issued to provide liquidity for the loan, making it easier to trade or transfer the assets in case of early loan repayment or liquidation.

8.2.2 Applications and Use Cases

- **AI and Data Centers**: Data centers that provide AI infrastructure can access funding by leveraging their computational assets as collateral for loans, enabling them to expand their operations, purchase more hardware, or scale infrastructure more quickly without the need for traditional bank financing.
- **Blockchain and DeFi**: In the blockchain space, compute-backed loans could help fund projects that require significant computational resources, such as decentralized storage systems or blockchain validators. Instead of relying on traditional investment rounds, projects could raise capital by offering compute resources as collateral.
- **Startups and Research Labs**: Startups in AI, machine learning, and other computationally intensive fields can access capital to fund their operations without needing to have traditional forms of collateral, such as property or other physical assets. This model democratizes access to finance for emerging technologies that rely heavily on compute power.

8.2.3 Benefits

- **Faster Access to Capital**: Compute-backed loans allow businesses in the AI and tech space to quickly access capital, as their computational infrastructure is used as an alternative form of collateral. This provides more flexibility and faster growth for companies in rapidly expanding sectors.
- **Flexibility and Efficiency**: These loans enable borrowers to secure capital without the need for real estate or equity-based collateral, which is particularly valuable for tech companies that may not own physical assets but rely heavily on computational power.
- **Enabling Growth and Innovation**: By unlocking capital tied to compute assets, compute-backed loans empower startups, researchers, and data centers to scale their operations and push forward innovation, particularly in AI and blockchain development.

8.3. Data-Backed Financial Instruments

Data-driven instruments leverage decentralized sources or streams of information (e.g. oracles, cross-chain event logs, IoT sensors) as core primitives for financial products. Below is a curated list of ideas for builders and innovators looking to harness new forms of data monetization, tokenization, and on-chain verification.

1) Verifiable Training Data Swaps

Idea. Builders can design a decentralized exchange for high-quality training data, wrapped in cryptographic proofs of origin or correctness (Baioumy & Cheema, 2024b). Data owners list "batches" that any model trainer or aggregator can purchase or rent. Royalties can be distributed automatically to original data contributors.

Implementation Sketch.

- **Off-chain indexing:** Standardize metadata (format, domain, data volume, etc.)
- **On-chain references:** Use IPFS/Arweave hashes for data identity
- **Proof-of-training logs:** Combine approaches like *Pytorch NFT Callback* to verify data usage
- **Shared revenue models:** Automatic splits for data owners

2) Decentralized Benchmarks for Asset Valuation

Idea. Use multi-source data feeds (e.g. from major CeFi/DeFi exchanges) to autonomously compute an on-chain reference price for illiquid assets or exotic tokens. The feed's consensus is anchored by a fault-tolerant multi-agent system that retrieves robust data from multiple oracles (Autonolas, n.d.).

Implementation Sketch.

- **Consensus oracles:** Adapt BFT-based oracles (Muttoni & Zhao, 2025) to handle weighted data from multiple sources

- **Insurance mechanisms:** Slash or penalize providers for feed manipulation
- **Continuous calibration:** Incorporate volatility adjustments and time-weighted moving averages

3) On-Chain ESG/Impact Data Tokens

Idea. Provide tokenized data that tracks carbon emissions, supply chain footprints, or other ESG metrics. DeFi protocols can then incorporate ESG scores into lending rates or insurance premiums, bridging real-world sustainability benchmarks with financial products.

Implementation Sketch.

- **Data feed construction:** Secure IoT streams or NGO-verified data on carbon offsets
- **Smart contract triggers:** Automatic rebalancing or interest rate changes based on an aggregated ESG score
- **Game-theoretic incentives:** Encourage third-party verifiers to constantly audit data integrity

4) ZK Data Assurance Markets

Idea. Allow data providers to offer "data assurance" using zero-knowledge proofs (ZKPs) that confirm certain quality or compliance properties without revealing the raw dataset. For example, an entity selling labeled medical data can prove it meets HIPAA standards *without* exposing the private details.

Implementation Sketch.

- **zk-SNARK frameworks:** Integrate *zkML* or *opML* approaches to verify data aspects (**verifiableInference**)
- **Bonded providers:** Providers stake tokens as collateral for data misrepresentation

- **Reward distribution:** Distribute micro-rewards to challenge verifiers who detect false claims

5) Data Futures and Options

Idea. Instead of classic commodity futures (corn, gold, etc.), tokenize *data* as a new commodity, enabling speculation on the future availability or quality of certain datasets. An example: a "futures contract" that commits to delivering AI training data in 6 months at a fixed price.

Implementation Sketch.

- **Collateralization:** Providers deposit partial data or tokens to back futures
- **Price discovery:** Use an aggregated reference feed (weighted by historical data trades)
- **Settlement logic:** At expiry, data must be proven valid and delivered or a penalty is enforced

6) NFT Royalties for On-Chain Observability Data

Idea. Crowdsource blockchain event logs (e.g. NFT trades, validator performance metrics) into structured "observability data sets." Tokenize these as data NFTs, and distribute ongoing royalties each time the data NFT is accessed or used in analytics.

Implementation Sketch.

- **NFT standard:** Wrap entire data sets or continuous data streams
- **Usage tracking:** Log queries or access calls to a smart contract "meter" for micropayments
- **RAG plugin:** Let LLM-based analytics fetch data from these NFTs at inference time

7) Crowdsourced Risk Data Pools

Idea. Insurance protocols often need accurate "historical risk tables." Builders can create decentralized pools of historical risk data (e.g. for parametric crop insurance) and sell usage rights to coverage providers. Contributors gain revenue shares from protocols using these data pools.

Implementation Sketch.

- **Staking for data veracity:** Each contributor stakes tokens; false or fraudulent data leads to slashing
- **Integration with keepers:** Keepers can verify new claims or updates in near-real-time (Autonolas, n.d.)

8) Machine-Learned Price Aggregators for Thinly Traded Tokens

Idea. Provide specialized aggregator data for low-liquidity tokens by training models that infer "fair prices" from correlated assets or order-book microstructures. DeFi protocols can reference these model-driven aggregators for more robust valuations.

Implementation Sketch.

- **Data ingestion:** Off-chain aggregator agents gather smaller exchange quotes
- **Model calibration:** Weighted ensemble that factors correlation with major tokens (ETH, BTC, etc.)
- **DAO governance:** Approve aggregator updates or new modeling approaches

9) Knowledge Graph Collateralization

Idea. Build credit markets secured by "knowledge graph" data (e.g. verifying IP licensing, reputation, academic credentials). Borrowers put up intangible collateral in the form of verified data (e.g. track record of successful AI-based start-ups), while lenders rely on cryptographically assured references.

Implementation Sketch.

- **On-chain representation:** Use *ERC-721* or *ERC-1155* to record each intangible "data credential"
- **Valuation oracles:** Evaluate user's "reputation graph," factor in raw data from social or enterprise footprints
- **Forced liquidation triggers:** If user's data credential is compromised, triggers an automatic default

10) RWA (Real World Assets) Underwriting with Sensor Data

Idea. For real estate or farmland tokenization, integrate IoT sensor data (soil condition, climate metrics, usage patterns) as a direct factor in rebalancing or interest rates. DeFi protocols can dynamically adjust borrowing costs based on sensor or on-chain feed anomalies.

Implementation Sketch.

- **Hardware attestation:** Guarantee sensor authenticity (e.g. trusted modules or TEEs)
- **Periodic aggregator updates:** Weighted feed from multiple farmland parcels
- **Agent-based compliance layer:** If sensor anomalies are large, an agent halts borrowing or triggers insurance

8.4. Model-Backed Financial Instruments

Next-generation financial products can revolve around actual *models* as productive assets—ranging from advanced generative LLMs to specialized risk-scoring ML. Similar to how intangible IP is increasingly tokenized, builders can treat models themselves as on-chain or off-chain collateral, yield sources, and more.

1) Model Staking and Fine-Tune Royalties

Idea. Treat model *weights* as intangible property. Owners stake their base model on a platform, and each time a developer fine-tunes it for a specialized domain, the original staker receives a share of the proceeds (Virtuals, n.d.).

Implementation Sketch.

- **Fine-tuning protocol:** Securely store base model on TEEs (Walters et al., 2025)
- **Staking logic:** Stakers lock tokens to mitigate malicious model claims
- **Revenue distribution:** Use buyback-and-burn mechanics or direct payout in stablecoins

2) ML-Performance Derivatives

Idea. Create derivatives tied to the performance metrics (e.g. inference accuracy, perplexity, benchmark scores) of a machine learning model over time. Traders can go long if they expect the model to improve or short if they anticipate performance drift (**transparentLLMDrift**).

Implementation Sketch.

- **Continuous evaluation:** A series of multi-agent evaluators benchmark the model daily
- **On-chain oracles:** Aggregate the benchmark results and serve as settlement feed for the derivative
- **Volatility tokens:** Let participants hedge or speculate on the model's performance swings

3) Collateralizing Future Inference Revenue

Idea. LLM or GPU providers can tokenize their future "inference capacity," letting them borrow stablecoins upfront. When users run inference, those fees automatically repay the

loan. The model's "throughput potential" acts as the underlying collateral.

Implementation Sketch.

- **Borrow-lend dApp:** Store hashed SLA (Service-Level Agreement) terms specifying compute availability
- **Locking capacity:** If the provider misbehaves or cannot serve inference, partial slash occurs
- **Revenue aggregator:** All query fees funnel into a loan redemption contract

4) Tokenized Model Portfolios

Idea. Group multiple specialized AI or ML models (e.g. an image-based model, a text-based LLM, a time-series model) into a single *portfolio* token. Each sub-model can be invoked for different tasks, generating diversified revenue streams.

Implementation Sketch.

- **Securitization of ML:** Mint an *ERC-4626*-like vault token representing partial ownership
- **Profit-sharing rules:** Weighted distribution of inference or licensing fees
- **Dynamic rebalancing:** If one model becomes outdated or too expensive to maintain, remove it from the portfolio

5) Insurance for Model Bias or Drift

Idea. Offer specialized coverage for ML services that might drift (or degrade) in accuracy. When a threshold of negative user feedback or benchmark regression is met, the protocol auto-pays claims to users affected by the model's mispredictions.

Implementation Sketch.

- **Performance checks:** Multi-party data sets test model drift daily (Baioumy & Cheema, 2024b)

- **Bonded underwriters:** Insurers post capital in a coverage pool
- **Oracle-based payouts:** If model accuracy drops below $x\%$ for y consecutive test cycles, claims are triggered

6) On-Chain Collaborative Model Training

Idea. Launch a "community training fund" where participants contribute data or partial compute resources, and collectively own the final model. This fosters token-based governance over major training decisions and the distribution of future licensing proceeds.

Implementation Sketch.

- **Consensus training:** Use a minimal BFT consensus or *Agent TCP/IP* (Muttoni & Zhao, 2025) to unify model parameter updates
- **Provenance tracking:** Developers log data sub-contributions on an L2 for composability
- **Revenue share:** Each contributor gets tokens based on data or compute shares used

7) Fine-Tuning Protocol with Pay-Per-Epoch

Idea. Instead of paying a lump-sum licensing fee, fine-tuners pay by the epoch. If they stop or degrade the training mid-way, the contract halts parameter updates. This reduces overhead for small start-ups wanting partial model upgrades without large capital outlay.

Implementation Sketch.

- **Smart contract deposit:** Fine-tuners deposit stablecoins for scheduled training epochs
- **Epoch checks:** A multi-agent environment confirms training tasks are completed
- **Model rollbacks:** If training halts, revert to last stable checkpoint (Autonolas, n.d.)

8) ZKML-Secured Model Streams

Idea. Builders can create an ML streaming service that yields incremental model improvements daily. Each improvement is validated by zk-proofs to show a real performance boost *without* exposing the entire model or dataset.

Implementation Sketch.

- **ZK circuit design:** Check partial gradient improvements or new perplexity metrics
- **Subscription model:** Users buy weekly "model updates" tokens
- **Fallback aggregator:** If an update is challenged as "no improvement," the aggregator can slash developer

9) Perpetual "Model Index" Derivatives

Idea. Construct an index representing the top 10 open-source AI models by usage or monthly inference volume. Let traders buy or short the index, reflecting bullishness or skepticism about the open-source ecosystem's growth.

Implementation Sketch.

- **Activity weighting:** Weighted by *inference calls* or *fine-tune frequencies*
- **Settlement feed:** Aggregated on-chain metric updated weekly by multi-agent watchers (Jayant, 2024)
- **Perpetual AMM:** Use perpetuals design (like Uniswap v3 range pools) for long/short

10) DAO-Governed Model IP Pools

Idea. Large communities can pool resources to purchase or commission specialized AI models (e.g. domain-specific LLM for legal or medical). A DAO uses on-chain votes to license out usage rights for a recurring royalty (Virtuals, n.d.).

Implementation Sketch.

- **Crowdfund deals:** The DAO invests in model R&D and mints IP tokens
- **Usage licensing:** Third parties pay stablecoins or token swaps to gain inference access
- **Collective governance:** Weighted token voting sets licensing rates or expansions

8.5. Agent-Backed Financial Instruments

Finally, *agent-backed* instruments revolve around deploying autonomous AI *agents* as critical economic participants. When multiple specialized agents coordinate resource allocation, or manage user funds, they can effectively function as self-sustaining financial entities (Walters et al., 2025).

1) Autonomous Hedge Funds

Idea. Inspired by multi-agent aggregator designs (Periphery, 2025), create a DeFi "hedge fund" purely run by collaborative or swarm intelligence. Agents handle strategies like cross-chain arbitrage, yield compounding, or derivative hedging, and stakers gain shares in the fund.

Implementation Sketch.

- **SLA scoring:** Each strategy agent is ranked by historical ROI plus adversarial stress tests
- **Agent synergy:** Agents *vote* on trades via a BFT consensus or *Agent TCP/IP* approach (Muttoni & Zhao, 2025)
- **Fee distribution:** Performance fees, buyback-burn for the aggregator token

2) Agent-Driven Param DAOs

Idea. A param DAO might manage a stablecoin's risk parameters or a Dex's fee tiers. Instead, multi-agent groups continuously monitor chain conditions, adjusting parameters

within bounded governance mandates. Minimizes the overhead of human voting for micro-changes.

Implementation Sketch.

- **Bounded autonomy:** Agents can only adjust parameters in a pre-defined range
- **Fail-safe override:** If $> 10\%$ of token holders disagree, they can force a revert within N hours
- **Adaptive algorithm:** Agents use on/off-chain data to set fees or ratio changes every epoch

3) Intent-Driven Trading Networks

Idea. Instead of raw swaps, users express *intents* (e.g. "Swap half my stablecoins for ETH if price dips by 5% this week"). Agent-based networks monitor these conditions, matching complementary intents or executing trades across multiple liquidity sources (Walters et al., 2025).

Implementation Sketch.

- **Intent aggregator agent:** Gathers user conditions from a front-end or aggregator dApp
- **Execution agents:** Check real-time oracles or aggregator quotes for best path
- **Shared transaction bundling:** Possibly use Gas abstraction for multi-user synergy

4) AI Escrow & Dispute Resolution

Idea. Agents act as neutral arbiters for P2P marketplaces (physical goods, services, or NFT trades). If a dispute arises, the escrow agent queries multiple data sources or possibly LLM-based logic to propose a settlement (Autonolas, n.d.).

Implementation Sketch.

- **Agent identity:** Governed by a reputable multi-agent network that is slashable for biased rulings
- **Adversarial checks:** Each party can challenge the agent's verdict with cost
- **DAO appeals:** A final on-chain "jury" can overturn extreme misjudgments

5) Delegated Yield Strategies ("Financial Companions")

Idea. Provide each user with an "AI companion agent" that invests, rebalances, or claims airdrops on behalf of the user, guided by personalized risk profiles (Jayant, 2024). This agent can manage multiple DeFi positions seamlessly while auto-compounding yields or bridging if needed.

Implementation Sketch.

- **User profile ingestion:** Combine wallet history and an optional questionnaire
- **Adaptive engine:** Agents monitor new yield farms or deposit windows
- **Off-chain scheduling:** Timed triggers or threshold-based rebalancing

6) Agent-Based Insurance Syndicates

Idea. Similar to Lloyd's of London, form "syndicates" of AI agents that collectively underwrite coverage for protocol exploits, validator slashing, or black-swan events. Each agent does partial risk assessment, and the group finalizes decisions with on-chain bonding (Autonolas, n.d.).

Implementation Sketch.

- **Agent roles:** Risk modeling agent, capital aggregator agent, claims adjuster agent
- **Premium logic:** Weighted by aggregator's risk consensus
- **Automated claims:** If an exploit is verified by majority, the coverage is automatically disbursed

7) Autonomous NFT Index Funds

Idea. AI agents scour NFT marketplaces for undervalued items, creating an index of top "blue chip" NFTs. A single token represents fractional ownership in the NFT portfolio, rebalanced by the agent as the market evolves.

Implementation Sketch.

- **Market analysis:** LLM or ML-based price predictions combined with on-chain liquidity signals
- **Permissioned operations:** Agents can buy/sell only whitelisted collections
- **Portfolio yield:** If assets are rentable, on-chain logic splits income among token holders

8) Collaborative Robo-Advisors for Legacy Finance

Idea. Offer multi-agent "robo-advisor" solutions integrating both on-chain yields and off-chain equities or bond ETFs. Use bridging or off-chain token wrappers for real-world assets (Walters et al., 2025).

Implementation Sketch.

- **CeFi integration:** Agent that monitors stock or ETF data (via regulated oracles)
- **DeFi aggregator agent:** Allocates leftover stablecoins to yield protocols
- **Periodic rebalancing:** Multi-agent consensus on risk weighting

9) Peer-to-Peer Option Writing Agents

Idea. Instead of centralized option sellers, allow a group of specialized underwriting agents to list options for certain tokens, adjusting premiums based on real-time market volatility.

Implementation Sketch.

- **Volatility aggregator:** Agents gather implied volatility from multiple DEXs
- **Dynamic premium setting:** Adjust option prices in near real-time
- **Shared coverage pool:** If large payouts occur, all underwriting agents share the losses

10) Agent-Verified Prediction Markets

Idea. In a "truth marketplace" spirit (**truthMarketplace**), deploy multi-agent oracles to verify event outcomes for prediction markets (e.g. sports, elections, DeFi exploits). Each agent references distinct data sources to finalize results with minimal trust.

Implementation Sketch.

- **Event watchers:** Agents parse external APIs or block-based events
- **Ruling aggregator:** BFT logic or *Agent TCP/IP* for final consensus (Muttoni & Zhao, 2025)
- **Slashing conditions:** Dishonest or absent watchers lose staked collateral

Chapter 9

Conclusions and Future Directions

9.1. Overview

AiFi has emerged as a transformative paradigm, bridging AI technologies with DeFi to create novel financial instruments and marketplaces. By converting core AI resources—compute, data, models, and agents— into tokenized assets, AiFi democratizes access to these valuable resources, fosters new investment opportunities, and automates essential financial processes. In doing so, AiFi has the potential to reshape both the AI and blockchain landscapes, unlocking new frontiers of innovation, growth, and inclusivity.

9.2. Major Growth Drivers and Opportunities

9.2.1 Compute Tokenization

Tokenizing compute remains a leading catalyst for AiFi. As AI workloads continue to scale—and require ever more GPUs, TPUs, or specialized hardware—this asset class stands poised for significant expansion. Recent estimates project the AI hardware market to grow from $53.71 billion in 2023 to over $473.53 billion by 2033 ('Artificial Intelligence (AI) in Hardware Market Report 2024-2033 — precedenceresearch.com', n.d.). AiFi expands the ability to fractionalize and finance expensive compute infrastructure, allowing investors to access yields from GPU-leasing or HPC usage. Simultaneously, smaller AI projects can more easily acquire the compute power they need, fueling broader R&D and

adoption.

9.2.2 Dataset and Data Pipeline Tokenization

Data serves as the lifeblood of AI, fueling model training and inference pipelines. By turning datasets into tradeable tokens, AiFi enables transparent marketplaces where data producers receive fair compensation, while AI developers gain access to high-quality, secure data. According to ('AI Training Dataset Market Size, Share, and Global Market Forecast to 2029 | MarketsandMarkets — marketsandmarkets.com', n.d.), the AI training dataset market could surpass $9.58 billion by 2029. Tokenizing data also addresses privacy concerns via on-chain licensing controls, fosters open collaboration, and encourages more diverse datasets—thereby improving model outcomes.

9.2.3 Model Tokenization

Pre-trained AI models (such as large language models, image generation networks, or domain-specific architectures) can be packaged into model tokens or used in Initial Model Offerings (IMOs). This approach grants developers and contributors access to capital for further research, while allowing investors to benefit from licensing revenues and inference fees. With the global AI software market expected to reach $391.43 billion by 2030 ('ABI Research — abiresearch.com', n.d.), model tokenization offers a significant slice of untapped potential.

9.2.4 AI Agent Tokenization

Beyond static AI models, autonomous agents (e.g., chatbots, robo-advisors, NFT characters, multi-agent services) represent a new horizon for AiFi. Valued at an estimated $47.1 billion by 2030 ('AI Agents Market Size, Share and Global Forecast to 2030 | MarketsandMarkets — marketsandmarkets.com', n.d.), these agents can be fractionalized, co-owned, and governed via smart contracts. The result is an *agentic economy*, in which AI services dynamically interact with DeFi protocols, orchestrating tasks from yield optimization to multi-party negotiations. Agent tokenization thus brings truly autonomous finance into everyday workflows.

9.3. Key Challenges and Limitations

Despite AiFi's promise, multiple obstacles remain before widespread adoption and scalability are achieved:

9.3.1 Technical Hurdles

Designing secure, scalable platforms to tokenize high-value AI assets is non-trivial. Interoperability between AI ecosystems and blockchains demands robust cryptographic proofs (e.g., zero-knowledge or optimistic methods), plus reliable oracles for external data. Equally challenging is the overhead of large-model inference and decentralized compute—where architectural decisions must balance cost, latency, and trust minimization.

9.3.2 Regulatory Uncertainty

Tokenizing AI resources touches on multiple regulatory domains, from securities laws and AML/KYC requirements to data-protection mandates. Regulatory clarity remains uneven across regions, and a globally consistent legal framework has yet to emerge. This fragmentation may slow cross-border collaborations and hamper institutional participation in AiFi.

9.3.3 Adoption and Public Trust

Crypto volatility, past platform hacks, and overall skepticism around blockchain can deter mainstream users and enterprises from embracing AiFi. Education and user-friendly onboarding (e.g., account abstraction, chain abstraction) are needed to lower friction and build confidence. Moreover, ensuring that AI tokens reflect genuine ownership—rather than mere hype—requires verifiability mechanisms and clear value propositions.

9.3.4 Market Liquidity

Like any emerging sector, AiFi will need time and infrastructure to build deep, liquid markets for GPU tokens, data tokens, model tokens, and agent-backed tokens. Secondary

markets, stable pricing oracles, and robust price discovery are essential to establishing widespread confidence. Liquidity constraints can also exacerbate the risk of market manipulation or price volatility.

9.4. Future Research Directions

Despite these challenges, AiFi retains immense promise. Ongoing and future research should explore:

9.4.1 AI-Blockchain Interoperability

Advancements in bridging AI workflows and blockchain networks are central. Proposed solutions may include specialized L2 rollups for AI computations, improved cryptographic schemes for verifiable inference (zkML, opML), and privacy-preserving data marketplaces.

9.4.2 New Tokenization Frontiers

As AI evolves, fresh assets will appear, whether in the form of domain-specialized models, multi-agent systems, or edge compute. Investigating how to tokenize and govern these emerging categories (e.g., using DAOs, sub-DAOs, agentic frameworks) will expand the AiFi ecosystem's scope.

9.4.3 Refined Regulatory & Legal Frameworks

Close collaboration with policymakers can yield more adaptive and globally consistent standards for tokenizing AI. Topics include licensing intangible model IP, enforcing privacy laws, preventing market abuse, and balancing on-chain transparency with user protection. Proactive engagement can reduce legal uncertainties and foster mainstream acceptance.

9.4.4 DeFi Products for AI Collateral

From AI-driven derivatives to compute-backed stablecoins and insurance protocols, financial experimentation continues. Building specialized DeFi solutions—such as stable assets

pegged to GPU yields, or parametric insurance for data breach—will unlock new risk management and yield opportunities. Integrating AI oracles, multi-agent collaboration, and real-time model scoring further pushes the boundaries.

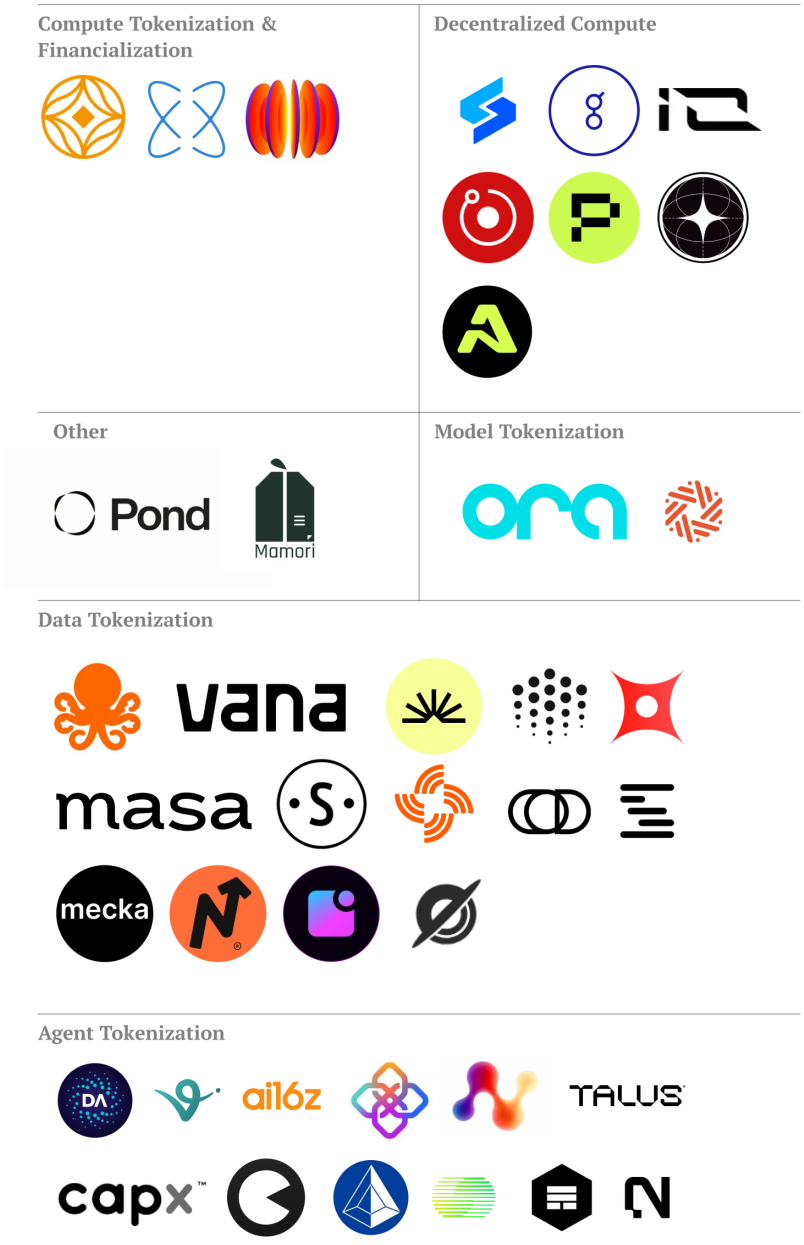
9.5. Closing Remarks

AiFi stands at the intersection of two rapidly growing domains—AI and decentralized finance—offering unprecedented opportunities to financialize essential AI resources, broaden investment access, and introduce self-governing AI services on-chain. While concerns about regulation, liquidity, privacy, and technological complexity remain, the long-term trajectory suggests that AiFi could reshape how we fund, deploy, and profit from artificial intelligence at scale. By harnessing the synergy of tokenization, programmable smart contracts, and advanced AI models, AiFi paves the way for a more inclusive, efficient, and innovative digital economy.

Realizing AiFi's full potential will require continued research, robust governance mechanisms, and thoughtful integration of both AI and blockchain best practices. Yet, the core vision—*financializing AI in a transparent, secure, and global marketplace*—holds the promise of unlocking new waves of growth, driving AI adoption, and democratizing access to this transformative technology across industries, geographies, and user communities.

Chapter 10

Current State of the Market



10.1. Compute Tokenization and Financialization

10.1.1 GAIB

Overview GAIB (/ga-yeeb/) is the first AI Economic Layer, creating a new type of yield bearing assets backed by real AI demands. It tokenizes enterprise-grade GPUs and their yields, creating a decentralized liquid market for compute assets, addressing the growing demand for high-performance computing while giving investors direct exposure to GPU assets. The platform supports a range of decentralized finance (DeFi) applications, including GPU-backed synthetic dollars, lending and borrowing, options and futures, and other derivatives. The name GAIB is inspired not only by the movie Dune, which means "the unseen or the future", but also by the three things we focus on: GPU, AI & Blockchain. Compute is the new currency and GPUs are a new asset class in the AI era, akin to spice in Dune, GAIB is liberating a trillion-dollar AI & compute market.

Mission GAIB's mission is to create a seamless economic layer for AI and compute by enabling access to high-demand AI assets, democratizing participation in the AI economy, and unlocking new investment opportunities. Through tokenizing GPUs and integrating decentralized finance, GAIB fosters scalable, secure, and transparent solutions that support the next generation of AI-driven growth.

Key Offerings

- **Tokenization of AI Assets:** Transforming enterprise-grade GPUs into tradable, yield-bearing tokens that allow for liquidity and investment in AI infrastructure.
- **AI Compute Financing:** Structuring innovative financing deals with cloud providers and data centers to accelerate infrastructure expansion, offering flexible, transparent capital solutions.
- **DeFi Integration:** Leveraging DeFi protocols to create a robust ecosystem around tokenized AI assets, enabling yield generation, staking, and personalized strategies for investors.

- **Innovative Financial Products:** Developing new financial primitives that enable exposure to AI growth, including AI Synthetic Dollars and other derivatives for users with diverse risk-reward profiles.

What GAIB Does Well

- **Bridges AI and DeFi:** GAIB seamlessly integrates the traditional AI compute market with the decentralized finance ecosystem, creating a direct connection between physical assets and blockchain-based financial products.
- **Democratizes Access to AI:**By tokenizing AI assets, GAIB opens up investment opportunities for a broader range of investors, providing equitable access to the profits generated by the AI revolution.
- **Scalable Infrastructure:** Through its partnerships with cloud operators and data centers, GAIB provides scalable funding solutions to meet the exponential demand for AI compute resources.
- **Risk Management and Security:** GAIB's platform incorporates stringent due diligence, robust credit analysis, and over-collateralization to ensure the security and stability of its financing deals and tokenized assets.
- **Composability and Innovation:** GAIB's DeFi-based approach enables composability with various lending, borrowing, and yield-trading protocols, fostering an innovative environment for new financial products built on tokenized AI assets.

Learn More For details, visit https://www.gaib.ai/.

10.1.2 Peri Labs (Periphery Protocol)

Overview Periphery (*/puh-ri-fuh-ree/*) operates as a three-sided high-performance compute (HPC) marketplace—uniting GPU owners, HPC task operators (e.g. AI/DePIN projects), and DeFi capital providers into one transparent, on-chain ecosystem (Periphery, 2025). By leveraging on-chain candle auctions for price discovery and reliability incent-

ives, Periphery unlocks significant efficiencies in the rapidly growing AI and DePIN sectors, collectively valued at over $500B.[1]

Mission Peri Labs' core mission is to unify fragmented HPC supply and demand into a seamless, on-demand market. Through algorithmic orchestration and dynamic strategy replication, Periphery aims to:

- **Maximize hardware utilization** for GPU owners by turning idle or underused compute resources into consistent revenue streams.
- **Deliver cost-effective, scalable compute** for a wide array of AI workloads (training, inference, multi-modal tasks) and for DePIN "intelligent mining" needs.
- **Offer stable, automated yield opportunities** to DeFi participants, bridging real-world hardware rentals and tokenized financial products in a single protocol (Bhat et al., 2023).

Key Offerings

- **Three-Sided HPC Marketplace:** GPU owners (Compute Providers), HPC Task Operators (AI/DePIN projects), and Capital Providers (DeFi investors) interact seamlessly. This ensures optimal matching of compute supply with the most profitable tasks at any given time.
- **Candle Auctions:** On-chain candle auctions end at semi-random intervals to prevent last-second bid sniping. Winning bids balance cost-efficiency for task operators and attractive, transparent returns (*"bribes"*) for hardware providers.
- **Dynamic Liquidity & Strategy Replication:** DeFi participants deposit into Periphery vaults, which automatically replicate proven HPC strategies at scale. AI-driven rebalancing algorithms spin up GPU nodes or shift to different tasks when market conditions or token economics change.

[1]Some estimates project the combined market potential to reach as high as $7T by the end of the decade.

- **On-Chain Tracking & Enforcement:** All node uptime, task completions, and penalty events are logged on-chain, ensuring verifiable service quality. Providers that fail to meet commitments are penalized and deprioritized, upholding consistent, high-quality compute provisioning.

What Peri Labs Does Well

- **Bridges HPC and DeFi:** By packaging real-world compute tasks into yield-bearing vaults, Periphery offers DeFi investors exposure to HPC returns without physical server ownership or complex operator mechanics.
- **Maximizes Hardware Utilization:** Underutilized GPUs—whether in data centers, decentralized platforms, or consumer devices—are monetized, boosting overall efficiency and lowering costs for AI/DePIN protocols.
- **AI/DePIN Focus:** The aggregator model accommodates both short-burst HPC demands (e.g. high-peak training) and longer-term distributed tasks (e.g. inference or specialized node mining).
- **Advanced Scheduling & Mechanism Design:** A proprietary queueing algorithm and candle auction framework enable robust, fair allocation of HPC resources, forming a defensible backbone for continuous market operation (Cheng et al., 2024).
- **Alignment via Penalties & Rewards:** Compute Providers earn more for reliable performance, ensuring AI/DePIN operators receive quality service. DeFi participants gain from stable, diversified yields, while HPC Operators benefit from flexible resource scaling.

Learn More For additional details on the Periphery Protocol's architecture, mechanics, and upcoming deployments, refer to the Peri Labs website at https://www.perilabs.net/.

10.1.3 Exabits

Overview Exabits is transforming the AI compute landscape by tokenizing enterprise-grade GPUs, enabling individual users to become stakeholders in high-performance AI

infrastructure. The platform offers direct exposure to compute assets and their yields, allowing participants to contribute to the expansion of GPU clusters, thereby enhancing compute capacity and efficiency. Trusted by AI enterprises and decentralized marketplace leaders, Exabits provides proprietary technology to optimize and stabilize the performance of both retail and commercial-grade chips, ensuring maximum compute output and substantial value creation for all ecosystem participants.

Mission Exabits aims to democratize access to AI compute resources by enabling individuals to invest in and benefit from the growth of AI infrastructure. Through the tokenization of GPUs and their associated yields, Exabits seeks to create a more inclusive and efficient AI compute economy.

Key Focus Areas

- **Tokenization of AI Compute Resources:**Transforming enterprise-grade GPUs into tradable tokens, allowing users to invest in and earn yields from AI compute assets.
- **Performance Optimization:** Developing proprietary technology to enhance and stabilize the performance of both retail and commercial-grade GPUs, ensuring maximum compute output.
- **Decentralized Infrastructure:** Building a decentralized network of GPU clusters to provide scalable and efficient AI compute services.
- **Partnerships with AI Enterprises:** Collaborating with leading AI companies and decentralized marketplaces to integrate Exabits' technology and expand its ecosystem.

What Exabits Does Well

- **Innovative Tokenization:** Pioneering the tokenization of AI compute resources, enabling broader participation in the AI economy.
- **Advanced Performance Optimization:** Utilizing proprietary technology to optimize GPU performance, ensuring high efficiency and reliability.

- **Strategic Partnerships:** Forming alliances with prominent AI enterprises and decentralized marketplaces to enhance platform credibility and reach.
- **Scalable Infrastructure:** Developing a decentralized network of GPU clusters that can scale to meet the growing demands of AI applications.
- **User-Centric Approach:** Providing individuals with opportunities to invest in and benefit from AI compute resources, democratizing access to AI infrastructure.

Learn More For details, visit https://www.exabits.ai/.

10.2. Decentralized Compute

10.2.1 Aethir

Overview

Aethir is a distributed cloud compute infrastructure that aggregates enterprise-grade GPU chips into a global network, providing on-demand compute resources for AI, gaming, and virtualized compute sectors. It enables enterprise GPU owners to unlock the potential of underutilized hardware while giving end users affordable access to the compute resources needed for AI training, real-time rendering, and other virtualized operations.

Mission

Aethir's mission is to democratize access to compute resources, especially in the context of AI and cloud gaming. By leveraging **DePINs** (Decentralized Physical Infrastructure Networks), Aethir aims to reduce the AI wealth gap caused by the concentration of GPU power in big tech. Through a decentralized model, it seeks to empower smaller AI companies and innovators by providing scalable and affordable compute resources that support the growth of AI and gaming technologies for the benefit of humanity.

Key Offerings

Aethir's key offerings include:

- **Scalable Compute Network**: A distributed model that scales rapidly to meet the growing demands of AI and gaming.
- **Real-time Rendering & AI**: Infrastructure supporting AI inferencing and real-time rendering, with low latency, ideal for cloud gaming and AI applications.
- **Web3 Integration**: Aethir leverages blockchain technology to incentivize resource owners with **$ATH tokens** and track resource consumption for transparent reward distribution.
- **Critical Use Cases**: Aethir supports AI model training, inferencing, cloud gaming, AI productization, and more.

What Aethir Does Well

Aethir excels in:

- **Scalability**: Its distributed model enables rapid expansion to meet the increasing demand for compute resources.
- **Low Latency**: Aethir ensures low-latency performance, particularly for real-time rendering and AI workloads.
- **Decentralized Ownership**: Resource owners retain control while contributing to the network, and are rewarded in **$ATH** tokens, ensuring fairness and flexibility.
- **Affordability**: Aethir's superior unit economics make on-demand compute accessible at a lower cost compared to traditional cloud providers.

Learn More For details, visit https://aethir.com/.

10.2.2 io.net

Overview

io.net is a decentralized GPU network that aggregates over 1 million GPUs from independent data centers, cryptocurrency miners, and projects like Filecoin and Render into

DePIN (Decentralized Physical Infrastructure Network) . It offers a distributed computing platform for machine learning (ML) engineers, enabling access to scalable, affordable, and customizable GPU resources on-demand.

Mission

To create an enterprise-grade decentralized computing network by pooling idle global GPU resources, making them accessible and affordable for AI and ML teams to optimize their workflows and tasks.

Key Offerings

- **IO Cloud**: Deploys and manages decentralized GPU clusters for AI and Python applications.
- **IO Worker**: Provides a user-friendly interface for managing GPU node operations, monitoring, and security.
- **IO Explorer**: Offers detailed statistical data and visualizations of the network, enabling users to track performance and reward transactions.

What io.net Does Well

- Provides low-cost**,** scalable access to GPU resources compared to traditional cloud services.
- Distributed cloud clusters: The platform provides a distributed cloud cluster where users can select suitable computing resources according to their needs and distribute tasks to different nodes for processing.
- Support for ML tasks: io.net Cloud focuses on providing computing resources for ML engineers, facilitating easier model training, data processing, and other tasks.

Learn More For details, visit https://www.io.net/.

10.2.3 Golem Network

Overview

Golem is a pioneering decentralized supercomputer that enables the creation of a global market for computing power. By leveraging a peer-to-peer network, Golem allows users to rent computing resources—such as CPU, GPU, and other processing power—from providers around the world. The platform offers a flexible, scalable, and cost-effective solution for a wide range of computational tasks, including CGI rendering, scientific calculations, and machine learning. Golem disrupts traditional cloud computing by lowering the cost of these complex applications, making them more accessible to a wider audience.

Mission

Golem's mission is to democratize access to high-performance computing by creating a decentralized infrastructure that facilitates secure, efficient, and cost-effective computation. Through its global network of distributed resources, Golem aims to empower developers and users with a platform that offers flexibility, scalability, and substantial cost reductions, while fostering an open and collaborative ecosystem for computational tasks.

Key Offerings

- **Peer-to-Peer Network**: Golem connects users to a decentralized network of computational resources, allowing requestors (users needing computational power) to rent processing capacity from providers (individuals or organizations with idle computing resources). This ensures that users only pay for the resources they need, on-demand.
- **Ethereum-Based Transaction System**: Golem integrates a dedicated Ethereum-based payment framework, enabling secure, transparent, and direct transactions between requestors, providers, and developers. This system facilitates the seamless exchange of computational power, ensuring fair compensation and efficient monetization of resources.
- **Developer Tools & Application Registry**: Golem provides a suite of tools

that allow developers to deploy, distribute, and monetize their software within the decentralized network. The Application Registry offers a space for developers to publish their software, and the Transaction Framework enables customization of payment mechanisms to suit different use cases and business models.

- **Infrastructure-as-a-Service (IaaS) and Platform-as-a-Service (PaaS)**: Golem functions as both an IaaS and a PaaS, offering a versatile environment for hosting and executing computational tasks. The platform supports diverse workloads ranging from data processing to AI model training, and allows for the easy scaling of tasks across the distributed network.

What Golem Does Well

- **Decentralized, Cost-Effective Computing**: Golem's decentralized architecture removes the inefficiencies of centralized cloud services, providing lower-cost access to high-performance computing. By tapping into underutilized resources, Golem drives down the cost of computation for complex applications, making them more accessible to a global audience.

- **Scalability & Flexibility**: The platform supports a wide array of computing needs, from simple tasks to complex workflows, across multiple industries. Whether for small-scale projects or large enterprise-level operations, Golem's infrastructure scales to meet the demands of users.

- **Empowering Developers**: Golem provides developers with powerful tools to not only run computational tasks but also distribute and monetize their software in a secure and transparent manner. The open nature of the platform fosters innovation, allowing developers to customize their applications and payment systems to meet the needs of their users.

- **Secure & Transparent Transactions**: By using blockchain technology for payments and transactions, Golem ensures security, transparency, and trust among users. This system removes the need for intermediaries, offering a direct and efficient payment process.

Learn More For details, visit https://golem.network/.

10.2.4 Render Network

Overview Render Network is a decentralized platform designed for massively scalable GPU rendering, tailored to meet the needs of 3D content creators. The network connects a global array of high-performance GPUs, enabling lightning-fast rendering for complex scenes that would otherwise be time-prohibitive on local workstations. By distributing rendering tasks in real time across hundreds of nodes, Render Network achieves unparalleled speeds and performance. The platform is specifically built to democratize access to high-end GPU rendering and compute, empowering artists and creators worldwide.

Mission

Render Network's mission is to democratize high-end GPU rendering, providing global access to powerful computational resources for 3D artists and creators. The network aims to enable the next generation of content creation in fields such as motion graphics, visual effects, generative AI, and immersive media. Through its decentralized approach, Render Network empowers artists to transcend the limitations of local computing power and explore new creative possibilities.

Key Offerings

- **Decentralized GPU Rendering**: The Render Network's global infrastructure allows for distributed rendering tasks across multiple nodes, achieving much faster rendering speeds compared to traditional local systems.
- **Scalability & Performance**: Designed to handle massive rendering workloads, Render Network provides scalable GPU power that can be dynamically allocated to meet the demands of the most complex projects.
- **Render Network Foundation**: A non-profit initiative to ensure that artists everywhere have access to high-end rendering capabilities, further supporting the mission of democratizing creative workflows.

- **Access to Leading-Edge Technology**: With nearly a decade of experience, the Render Network has served some of the world's leading artists in industries such as motion graphics, architectural visualization (archviz), and visual effects.

What Render Network Does Well

- **Lightning-Fast GPU Rendering**: Render Network excels at enabling high-speed rendering for complex 3D scenes through its distributed GPU architecture, providing faster results than traditional cloud farms or local systems.
- **Global Accessibility**: With its decentralized nature, the Render Network allows artists from around the world to access world-class GPU resources without the high costs and limitations associated with centralized solutions.
- **Empowering Creativity**: By breaking the constraints of local computing power, Render Network enables artists to explore more ambitious projects in CG, immersive media, and spatial computing, pushing the boundaries of creativity.

Learn More For details, visit https://rendernetwork.com/.

10.2.5 Phala Network

Overview

Phala Network is a next-generation cloud platform that provides a secure, low-cost, and user-friendly environment for developers to build trustless applications. By leveraging a hybrid infrastructure that combines Trusted Execution Environments (TEEs), blockchain, Multi-Party Computation (MPC), and Zero-Knowledge Proof (ZKP), Phala enables zero-trust computing. Its focus is on delivering private, verifiable, and affordable solutions, making confidential AI inference, secure data processing, and verifiable computations accessible to developers in the Web3 ecosystem.

Mission

Phala Network's mission is to make trustless computing widely accessible to developers, empowering them to build secure, privacy-preserving applications in a decentralized en-

vironment. By offering a flexible, affordable, and open-source platform, Phala aims to address key challenges in Web3, such as data privacy, secure execution, and computational verifiability.

Key Offerings

- **Zero-Trust Environment**: Phala Network provides a fully decentralized and secure platform built on TEE, MPC, and ZKP, ensuring that no single provider, cloud platform, or hardware vendor is trusted.
- **Confidential AI Inference**: Phala enables private, verifiable AI computations, ensuring that sensitive data and AI model integrity are protected in Web3 applications.
- **Agentize Smart Contracts**: Developers can create AI-powered smart contracts and AI agents for popular Web3 services, enabling business logic enforcement and decentralized operation via DAOs.
- **Cross-Platform Multi-Agent Connectivity**: Phala allows AI agents to interact across various platforms such as Autonolas, FLock.io, Morpheus, and Polywrap, facilitating interoperability in the Web3 ecosystem.
- **Incentivized Agent Economy**: Developers can launch their AI agents and monetize them using Phala's default tokenomics model or create a custom incentive structure.

What Phala Network Does Well

- **True Zero-Trust Security**: Phala's security model eliminates trust in any single provider, ensuring that all data, computations, and execution are private and verifiable, addressing critical concerns in Web3 environments.
- **Developer-Focused & Accessible**: Phala provides a user-friendly experience that enables developers to easily migrate their Web2 software to a zero-trust environment with minimal friction. Its flexible infrastructure adapts to different use cases, making it cost-effective for a broad range of developers.

- **Web3 Compatibility**: Fully decentralized, privacy-focused, and auditable, Phala seamlessly integrates with blockchain ecosystems, enabling decentralized applications to leverage advanced security features and verifiable computations.
- **Privacy and Verifiability for AI**: The platform ensures that AI models run securely within Trusted Execution Environments, safeguarding sensitive data while delivering the necessary verifiability for use in blockchain-based applications.

Learn More For details, visit https://phala.network/.

10.2.6 Singularity Finance

Overview

Singularity Finance's Layer 2 (SFI L2) is a specialized blockchain platform designed to address the unique challenges of tokenizing the AI economy. By providing a scalable, efficient, and compliant environment, SFI L2 enables seamless integration of AI infrastructure with decentralized finance (DeFi), tokenization of Real-World Assets (RWAs), and the creation of AI-powered decentralized applications (dApps). Its focus on reducing liquidity constraints, improving asset valuation, and enhancing accessibility for both developers and traditional companies makes it a crucial component in the evolution of AI economies within the blockchain ecosystem.

Mission

Singularity Finance aims to unlock the full potential of the tokenized AI economy by providing a robust and scalable Layer-2 platform tailored to address the complexities of AI asset tokenization. Its mission is to facilitate the creation of sophisticated financial products, improve liquidity, ensure fair asset valuations, and enable greater accessibility for developers and traditional companies. By leveraging the decentralized nature of blockchain and the capabilities of the SingularityNET ecosystem, Singularity Finance seeks to drive the widespread adoption of AI in Web3.

Key Offerings

- **Scalability & Efficiency**: With high throughput and low transaction costs, SFI L2 enhances Ethereum's capabilities, enabling higher transaction volumes and making small and microtransactions economically viable.
- **DeFi Integration & Financial Innovation**: SFI L2 is fully compatible with Ethereum's Virtual Machine (EVM), allowing the integration of DeFi protocols for collateralization, yield farming, restaking, and the creation of AI infrastructure futures, options, and AI asset index funds.
- **Fair Valuation & Market Discovery**: By promoting active on-chain trading and liquidity, SFI L2 facilitates effective price discovery, addressing the current lack of benchmarks in AI asset valuation.
- **Collaborative Ecosystem**: SFI L2 encourages the development of AI-powered applications, supporting innovators and developers with a thriving ecosystem, enhanced by strategic alignment with SingularityNET and the Artificial Superintelligence Alliance (ASI).
- **AI Infrastructure Tokenization**: Singularity Finance tokenizes both tangible (e.g., data centers, hardware) and intangible (e.g., data, applications) assets, addressing every stage of the AI economy and accelerating market growth.

What Singularity Finance L2 Does Well

- **Enhanced Scalability**: The Layer-2 solution allowing for high throughput and low-cost transactions, ideal for handling large volumes of AI-related operations.
- **Financial Product Innovation**: By enabling the creation of collateralized AI assets, futures, options, and AI asset index funds, Singularity Finance opens up new financial opportunities for developers, enterprises, and investors in the AI space.
- **Regulatory and Compliance Assurance**: The integration of compliance mechanisms makes Singularity Finance L2 an attractive option for traditional enterprises, addressing concerns around adoption, regulation, and security in the Web3 space.

- **Seamless Web3 Integration**: With EVM compatibility and strong cross-chain interoperability, SFI L2 seamlessly integrates with existing blockchain ecosystems, enhancing the functionality and accessibility of AI-related decentralized applications.

Learn More For details, visit https://singularityfinance.ai/.

10.2.7 Spheron

Overview

Spheron is a decentralized compute marketplace designed to connect data centers and individual device owners with developers and startups seeking GPU power. By providing a peer-to-peer network and a tiered provider system, Spheron streamlines the leasing, selling, and monetization of GPU resources, enabling affordable, scalable, and on-chain solutions that cater to the evolving needs of AI and Web3 development.

Mission

Spheron aims to future-proof businesses by building the world's largest and most accessible DePIN (Decentralized Physical Infrastructure Network) compute ecosystem. Through intelligent matchmaking, developer-friendly tooling, and a community-governed approach, Spheron aspires to remove traditional barriers to Web3 compute adoption, empowering innovators to deploy their ideas without reliance on centralized clouds.

Key Offerings

- **GPU Marketplace**: A peer-to-peer platform where anyone can lease or sell GPU power, making compute resources accessible from anywhere in the world.
- **Tiered Provider System**: Categorizes and ranks providers based on performance and trust, delivering reliable and optimized compute solutions.
- **Decentralized Governance**: Ensures community ownership and decision-making, reducing the risk of centralized bottlenecks or disruptions.

- **Developer-Centric Tools**: SDKs, CLI tools, and an intuitive dashboard that streamline resource monitoring, making it easier for users to integrate compute into DevOps pipelines.
- **On-Chain Infrastructure**: By prioritizing on-chain functionality, Spheron maximizes transparency, security, and autonomy for developers and service providers.

What Spheron Does Well

- **Ease of Adoption**: Simplifies GPU access, removing the complexity and friction often associated with Web3 compute offerings.
- **Scalability & Flexibility**: Offers a global network of compute resources that can scale with evolving developer needs, from AI agents to complex Web3 applications.
- **Community-Driven Development**: Empowers providers and users to shape the network through governance, ensuring a vibrant, self-sustaining ecosystem.
- **Innovative Infrastructure**: Introduces features like FIZZ Nodes, Provider Nodes, and Skynet, paving the way for next-generation decentralized computing.

Learn More For details, visit https://www.spheron.network/.

10.3. Data Tokenization

10.3.1 Sahara AI

Overview Sahara AI is a decentralized blockchain platform designed to foster open, equitable, and collaborative artificial intelligence development. By integrating blockchain technology with AI, Sahara AI ensures the sovereignty and provenance of AI assets, promoting security, equity, and accessibility for all users. The platform offers a layered architecture that provides full control over AI assets, enabling businesses to own, monetize, and scale their proprietary knowledge.

Mission Sahara AI's mission is to revolutionize AI development by creating a decentralized ecosystem where users, data sources, and AI trainers are fairly compensated for their contributions. The platform aims to address ethical concerns related to copyright, privacy, resource access, and economic imbalances in AI development, ensuring that all participants benefit from the advancements in AI technology.

Key Focus Areas

- **Decentralized AI Development:** Facilitating open and collaborative AI development through a decentralized platform that ensures the sovereignty and provenance of AI assets.
- **Blockchain Integration:** Utilizing blockchain technology to provide a transparent and secure infrastructure for AI development, ensuring that all contributions are properly attributed and compensated.
- **AI Asset Management:** Offering a layered architecture that allows businesses to own, monetize, and scale their proprietary AI knowledge, enhancing the value and utility of AI assets.
- **Ethical AI Practices:** Addressing ethical concerns in AI development by ensuring fair compensation and transparent usage of AI models and data, promoting responsible and equitable AI practices.

What Sahara AI Does Well

- **Promotes Open Collaboration:** Encourages a collaborative environment where various stakeholders can contribute to AI development, fostering innovation and diversity in AI solutions.
- **Ensures Fair Compensation:** Provides mechanisms to fairly compensate users, data sources, and AI trainers, ensuring that all contributors benefit from the advancements in AI technology.
- **Enhances AI Asset Value:** Enables businesses to effectively manage and scale their AI assets, increasing their value and applicability across various industries.

- **Addresses Ethical Concerns:** Tackles issues related to copyright, privacy, and economic imbalances in AI development, promoting responsible and ethical AI practices.
- **Attracts Strategic Partnerships:**Collaborates with leading tech firms such as Microsoft, Amazon, and Snap, enhancing the platform's credibility and expanding its ecosystem.

Learn More For details, visit https://saharalabs.ai/.

10.3.2 OpenLedger

Overview OpenLedger is a decentralized data blockchain tailored for AI applications, providing a trust infrastructure to develop specialized language models (SLMs). By leveraging datanets to collect, curate, and tokenize data, OpenLedger enables the creation of high-quality AI models for agents, chatbots, copilots, and other applications. This approach introduces a new economic model for AI, ensuring fair compensation for data contributors and model creators through its Payable AI framework. OPENLEDGER.XYZ

Mission OpenLedger's mission is to revolutionize AI development by creating a decentralized platform that ensures transparency and fair compensation for data contributors. Through its Payable AI model, OpenLedger aims to empower individuals and organizations to participate in the AI ecosystem, fostering innovation and collaboration.

Key Focus Areas

- **Payable AI Models:** Developing efficient and compact specialized language models that attribute data contributions from various datanets, enhancing model accuracy and applicability across industries.
- **Datanet Layers:** Establishing decentralized networks (datanets) for specialized data sourcing, involving contributors, owners, and validators to curate high-quality, domain-specific data for AI training.

- **Blockchain Layer:** Utilizing an EVM-compatible Layer 2 blockchain to enable smart contracts for data contribution and attribution, supporting applications like on-chain inference and AI-driven solutions.

What OpenLedger Does Well

- **Decentralized Data Infrastructure:** Provides a robust, decentralized platform for AI data collection and curation, ensuring data integrity and accessibility.
- **Fair Compensation Mechanism:** Introduces the Payable AI model, ensuring transparent and equitable rewards for data contributors and model creators.
- **Specialized Language Models:** Focuses on developing efficient SLMs that enhance AI applications' performance across various sectors.
- **Blockchain Integration:** Employs blockchain technology to secure data transactions and enable smart contract functionalities, enhancing trust and automation in AI development.
- **Collaborative Ecosystem:** Fosters a collaborative environment by involving multiple stakeholders in the data curation and model development process, promoting innovation and shared growth.

Learn More For details, visit https://www.openledger.xyz/.

10.3.3 Vana

Overview Vana is a decentralized network designed to revolutionize data ownership, sharing, and monetization. By utilizing DataDAOs (Decentralized Autonomous Organizations for Data), Vana enables users to pool, tokenize, and govern their data, ensuring control, privacy, and the opportunity to profit from their contributions. The Vana L1 blockchain serves as the foundation for this infrastructure, supporting next-generation applications such as AI models and data-driven decentralized apps (dApps). VANA.ORG

Mission Vana's mission is to empower individuals by providing full control over their data and the AI models they contribute to. By building an open ecosystem for user-owned data, Vana aims to shift the flow of data towards a more equitable and prosperous world. VANA.ORG

Key Focus Areas

- **DataDAOs:**Facilitating the creation of decentralized organizations where users can contribute, tokenize, and govern their data collectively.
- **Data Tokenization:** Transforming user data into tokens that can be securely used across various decentralized applications, particularly in AI development.
- **User Compensation:** Ensuring that data contributors are fairly compensated when their data is utilized by AI developers or other applications.
- **Decentralized Infrastructure:** Providing a non-custodial, portable data infrastructure that supports the development of personalized applications and AI models.

What Vana Does Well

- **Empowers Data Ownership:** Enables users to retain full control over their data, promoting privacy and autonomy.
- **Facilitates Fair Compensation:**Introduces a transparent system where users are rewarded for their data contributions, fostering a more equitable data economy.
- **Supports Decentralized Applications:** Provides a robust infrastructure for the development of AI models and dApps, enhancing innovation in the decentralized space.
- **Ensures Data Portability:** Allows users to seamlessly contribute and utilize their data across various platforms without compromising security or privacy.

- **Promotes Community Governance:** Empowers users to participate in the governance of DataDAOs, ensuring that data usage aligns with community interests and values.

Learn More For details, visit https://www.vana.org/.

10.3.4 Ocean Protocol

Overview

Ocean Protocol is a decentralized data exchange protocol that enables the secure and efficient sharing, discovery, and monetization of data in the AI ecosystem. By using blockchain technology, Ocean facilitates access to a broad range of data assets, from raw AI training data to models and predictions. The protocol empowers data owners to retain control over their assets while providing AI developers and researchers with the data they need for training models, without compromising privacy.

Mission

Ocean Protocol's mission is to unlock the value of data by creating a decentralized data marketplace where individuals and organizations can share, buy, and sell data assets while maintaining privacy and control. It aims to support the growth of AI by enabling secure, trusted access to valuable datasets, fostering innovation, and democratizing access to data for all users in the AI ecosystem.

Key Offerings

- **Data NFTs and Datatokens**: Ocean utilizes ERC721 data NFTs and ERC20 datatokens to facilitate de their services as data NFTs, and consumers can access these services by holding the corresponding datatokens.
- **Compute-to-Data (C2D)**: This feature allows consumers to run computations on private data without exposing the data itself. The data remains on its premises, with only the results shared, ensuring privacy while enabling valuable insights and research.

- **Cross-Platform Data Storage**: Data can be hosted on decentralized storage solutions like Filecoin or Arweave, or centralized platforms like AWS or Azure, allowing flexibility in how and where data is stored and accessed.
- **Decentralized Data Exchange**: Ocean enables users to buy, sell, and share data in a decentralized manner, allowing for better monetization opportunities for data owners and more accessible data for AI practitioners.

What Ocean Protocol Does Well

- **Privacy-Preserving Data Exchange**: Ocean's Compute-to-Data functionality ensures that private data can be utilized without ever leaving the premises, maintaining privacy while enabling valuable data-driven insights.
- **Decentralized and Transparent**: Ocean's use of blockchain technology ensures that data transactions are transparent, secure, and trustless, allowing users to retain control over their data while participating in a decentralized economy.
- **Easy Access to Data for AI**: Ocean makes it easy for AI developers and researchers to access high-quality data, facilitating the growth of AI applications across industries.
- **Flexibility Across Platforms**: Ocean allows data to be stored and accessed across various platforms, including decentralized storage like Filecoin and Arweave, or centralized solutions like AWS and Azure, enabling broader adoption across different industries.

Learn More For details, visit https://oceanprotocol.com/.

10.3.5 Masa

Overview

Masa is a decentralized AI data network focused on democratizing access to proprietary, high-quality, and verified personal data for AI model training. By transforming users into both data contributors and data scrapers, Masa aggregates and structures vast amounts

of user data — including browsing histories, preferences, and behaviors — into a secure and private data network. This data is then made available to developers for the creation of specialized, hyper-personalized AI applications. Through its innovative use of zero-knowledge Soulbound Tokens and decentralized large language models (LLMs), Masa provides a new model for data privacy and real-time, decentralized data access.

Mission

Masa's mission is to empower individuals by giving them control over their personal data and enabling them to contribute to and earn from a decentralized AI ecosystem. By providing developers with access to a unique, constantly growing dataset, Masa seeks to revolutionize AI development through hyper-personalized, privacy-preserving models. The platform focuses on building a secure, transparent, and real-time data network that enables AI applications to be more specialized, valuable, and capable of powering truly innovative AI solutions.

Key Offerings

- **Decentralized Data Aggregation**: Masa allows users to contribute their data to the network through activities like quests on the Masa App, browsing with the Chrome Extension, and engaging in the Masa Partner Ecosystem. This data is then aggregated and structured for AI use.
- **Zero-Knowledge Soulbound Tokens**: Masa uses zkSBT to ensure that data is kept private and secure, while also giving users the ability to control how and when they share their data.
- **Data Staking Pools**: Developers can set up staking pools to reward users for sharing their data, making the process of contributing to AI model training financially incentivized.
- **Decentralized LLMs**: Masa's Oracle Network decentralizes access to large-language models (LLMs), enabling real-time data searches, trend analysis, and sentiment analysis, while maintaining data privacy.

- **Hyper-Personalized AI Models**: By leveraging proprietary data, Masa enables the creation of specialized AI agents and assistants, offering a competitive edge by powering AI models with more precise, personalized data compared to generalized AI systems.
- **Real-Time Data Access**: Masa's decentralized LLMs allow for real-time data processing and results, giving developers the ability to make more accurate predictions, detect trends, and provide timely insights.

What Masa Does Well

- **User Empowerment & Privacy**: Masa stands out by allowing users to monetize their personal data in a secure and privacy-preserving way, utilizing innovative cryptographic technologies like zero-knowledge proofs.
- **Decentralized Data Access**: Unlike traditional AI networks, Masa allows for real-time, decentralized access to data, ensuring that LLMs can evaluate encrypted data and generate insights without compromising user privacy.
- **Hyper-Personalization for AI Models**: The network's unique data collection approach creates specialized datasets that enable AI models to be highly personalized and relevant, opening up new opportunities for AI applications.
- **Developer-Friendly Ecosystem**: With features like data staking pools and decentralized LLM access, Masa makes it easy for developers to integrate proprietary, structured data into their AI models without complex infrastructure or hosting requirements.

Learn More For details, visit https://www.masa.ai/.

10.3.6 Santiment

Overview

Santiment is pioneering the creation of a comprehensive datafeeds platform tailored specifically for the cryptocurrency and blockchain markets. The platform focuses on providing

real-time datafeeds, sentiment analysis, and exclusive content streams related to cryptocurrency assets. By offering access to a regularly updated database of cryptocurrency projects and sentiment-driven market insights, Santiment equips traders, investors, and businesses with the necessary tools to maximize profits and minimize risks in the fast-moving crypto space. The platform integrates with third-party services like exchanges and asset management platforms to broaden its market reach and influence.

Mission

Santiment's mission is to build the market data infrastructure for the cryptocurrency ecosystem by establishing the first-ever platform dedicated to delivering high-quality, actionable datafeeds for crypto markets. Their long-term goal is to set market standards for cryptocurrency market data, transparency, and best practices, ultimately becoming the go-to hub for all cryptocurrency-related financial information.

Key Offerings

- **Crypto-Market Datafeeds**: Santiment provides real-time, accurate datafeeds on cryptocurrency prices, market movements, and blockchain projects, offering valuable insights to traders and investors.
- **Sentiment Analysis**: The platform includes sentiment analysis tools that track the crowd's mood and sentiment regarding cryptocurrency projects, a key factor driving price fluctuations in the crypto markets.
- **Content Streams & Project Database**: Santiment delivers exclusive content and a continuously updated database of cryptocurrency projects, offering insights into their development and status.
- **Mobile & Web Terminals**: Datafeeds are accessible through both mobile and web terminals, ensuring easy access for crypto professionals and enthusiasts on the go.
- **Third-Party Integrations**: Santiment integrates its datafeeds into third-party platforms like exchanges and asset management services, helping to expand its reach

and provide seamless access to a wider audience.

What Santiment Does Well

- **Comprehensive Data Infrastructure**: By offering a wide range of datafeeds, exclusive content, and sentiment analysis, Santiment helps market participants navigate the complex world of cryptocurrency with up-to-date, accurate information.
- **Wide Integration**: The platform's integration with popular crypto exchanges and asset management platforms ensures that Santiment's data is accessible to a broad audience of traders and investors.
- **User-Friendly Tools**: The mobile ALPHA app and web terminals make it easy for users to access sentiment feeds, price data, and project information, while also offering tools for sentiment journaling to track and analyze their trading behavior.

Learn More For details, visit https://www.santiment.net/.

10.3.7 Streamr Network

Overview

The Streamr Network is a decentralized, peer-to-peer network that facilitates real-time data publishing and subscribing. It enables applications to exchange data and broadcast updates across decentralized systems, ensuring secure, robust, and scalable data transport. Streamr serves as a foundational platform for decentralized applications, acting as a middleware for data transport.

Mission

Streamr aims to create a decentralized infrastructure for real-time data streaming and messaging, enabling secure, censorship-resistant data sharing and monetization. The platform focuses on empowering individuals and organizations to share data seamlessly and to benefit from the value generated by this data exchange.

Key Offerings

- **Real-Time Data Transport**: Streamr enables secure, real-time messaging between applications, devices, and users.
- **Data Sharing**: The platform allows organizations to publish real-time data with minimal infrastructure investment.
- **Data Monetization**: Streamr supports the creation of **Data DAOs** (Data Unions), enabling individuals to monetize their data through smart contracts.
- **Topic-Based Messaging**: Data is organized into streams, which can be subscribed to by interested parties, ensuring efficient and scalable communication.

What Streamr Does Well

- **Decentralized Messaging**: Streamr excels in providing a scalable and secure messaging solution for decentralized applications, offering high availability and robust data transport.
- **Real-Time Data Access**: The platform offers real-time access to data from diverse sources, including IoT devices, public transport systems, and external commercial data feeds.
- **Data Monetization & Transparency**: Streamr stands out in enabling users to monetize their data through Data Unions, ensuring fairness and transparency in the data exchange process.

Learn More For details, visit https://streamr.network/.

10.3.8 Codatta

Overview

Codatta is a decentralized network connecting AI developers with data creators to co-train Artificial General Intelligence (AGI). Powered by XnY, Codatta aims to solve significant challenges within the data ecosystem, offering high-quality frontier data for sectors

like Digital Assets, Healthcare, Robotics, and AI Ecommerce. Since its launch in April 2024, the platform has rapidly grown to over 200,000 users, with increasing demand for its innovative data solutions.

Mission

Codatta's mission is to break down data silos, ensure data integrity, and eliminate inefficiencies in the traditional data curation process. By offering decentralized, high-quality data aggregation and curation, Codatta empowers developers and creators to contribute to the advancement of AGI through collaborative, automated data mechanisms.

Key Offerings

- **Data Confidence**: Through a combination of AI, human intelligence, and economic systems, Codatta ensures data integrity, incentivizing accurate submissions while discouraging fraud.
- **Extensibility**: The platform is highly adaptable, allowing the expansion of its data scope to meet the evolving needs of Web3 applications.
- **Public Accessibility**: Codatta is permissionless, promoting innovation and collaboration while maintaining data security through minimal access conditions for sensitive datasets.
- **Data Sourcing**: Includes valuable datasets like Account Annotations and User Demographic Annotations, essential for AML software, risk management, and personalized decentralized applications.

What Codatta Does Well

- **Decentralized Data Curation**: Codatta stands out by decentralizing the data curation process, ensuring higher quality and confidence through AI, human intelligence, and community-driven validation.
- **Incentivized Data Validation**: With economic mechanisms such as reputation scores and gas burning, Codatta ensures the submission of high-quality, verified

data.

- **Adaptability & Scalability**: The platform's infrastructure is designed to be highly extensible, providing a scalable solution for an ever-evolving Web3 ecosystem without compromising performance or security.

Learn More For details, visit https://codatta.io/.

10.3.9 Mecka

Overview

Mecka is the data layer for AI robotics, leveraging tokenomics to create superior training data for humanoid robotics. Mecka is pioneering a play-to-earn ecosystem that blends real-world experiences with the cutting-edge realm of humanoid robotics. By focusing on multi-modal data collection, Mecka accelerates the development of advanced humanoid AI systems by providing robotics companies with the precise movement datasets they need to train their robots effectively.

Mission

Mecka.ai's mission is to work closely with robotics companies to create specialized, high-quality training data that captures the intricacies of human movement through comprehensive multi-modal data collection. This collaboration helps robotics companies advance humanoid AI, unlocking new possibilities in robotic movement and interaction.

Key Offerings

- **Multi-Modal Data Collection**: Mecka combines high-quality video recordings with sensor data to capture the full range of human movement, ensuring robots learn natural, effective movements.
- **Collaborative Development**: The team at Mecka works closely with robotics companies, continuously refining their data collection process to meet the specific needs and quality standards of each project.

- **Play-to-Earn Ecosystem**: Mecka introduces tokenomics into its data collection, integrating a play-to-earn system that incentivizes users and developers to contribute to the training data collection process.

What Mecka Does Well

- **Comprehensive Data Collection**: By integrating both visual and sensor-based data, Mecka provides the most complete and detailed datasets for training humanoid robots, ensuring natural movement replication.
- **Customization and Collaboration**: Mecka works closely with its partners, continuously adapting its data collection process to meet the unique challenges of each robotics team.
- **Cutting-Edge Data Solutions**: Mecka is pushing the boundaries of AI and robotics development, helping to accelerate innovation in humanoid robotics through high-quality, real-world movement data.

Learn More For details, visit https://mecka.ai/.

10.3.10 Navigate

Overview

Navigate is the first Web3-native big data platform that gamifies and decentralizes the collection of training data. With its mission to build a decentralized intelligence platform, Navigate empowers individuals to earn from the valuable data they generate daily. The platform addresses the growing demand for AI training data by creating and augmenting datasets through community-driven efforts.

Mission

Navigate aims to revolutionize the way AI training data is sourced by building a decentralized platform owned, powered, and governed by its community. It leverages programmable incentives to engage millions of individuals, making data collection a fun and rewarding

global activity. The goal is to provide reliable, equitable access to AI training data while enabling individuals to earn from their contributions.

Key Offerings

- **Data Quest**: Navigate's core offering is Data Quest, an application that gamifies the collection of AI training data. Users are rewarded for actively contributing valuable data through quests and for passively providing data streams via connections.
- **Decentralized Intelligence Platform**: Navigate offers a decentralized platform that ensures data collection is efficient and community-driven, helping to solve the issue of limited publicly available training data.

What Navigate Does Well

- **Gamification of Data Collection**: By turning data collection into an engaging and incentivized activity, Navigate makes it easy for individuals to contribute valuable data without effort, helping to rapidly build training datasets for AI.
- **Community-Driven Platform**: Navigate's decentralized platform empowers its community through programmable incentives, making it possible to coordinate millions of contributors and continuously augment training data.
- **Sustainable Data Sourcing**: Navigate ensures a reliable, equitable, and scalable solution for sourcing AI training data from scratch, addressing the shortage of publicly available datasets.

Learn More For details, visit https://nvg8.io/.

10.3.11 Fraction AI

Overview

Fraction AI is a protocol that transforms AI data generation into a competitive marketplace. In this decentralized arena, AI agents compete every minute to generate high-quality data, with real economic incentives rewarding their creators. The protocol fosters

innovation and improvement by combining competition and collaboration between builders and stakers.

Mission

Fraction AI aims to create a sustainable and rewarding ecosystem for AI data generation by providing a competitive platform where AI agents generate high-quality data, rewarding both the creators and the stakers that support the protocol. The protocol drives continuous improvement in AI outputs by integrating dynamic quality assessments and real-time feedback loops.

Key Offerings

- **AI Data Generation Marketplace**: Builders deploy AI agents to generate data in a competitive format, where high-quality outputs are rewarded.
- **Staking Mechanism**: Stakers support the protocol by staking ETH, earning consistent yields from competition fees, protocol fees, and data licensing revenue.
- **Real-Time AI Validation**: Outputs are evaluated in real-time based on quality, compliance, and historical performance, creating a dynamic feedback loop for improvement.

What Fraction AI Does Well

- **Decentralized Competition Model**: Fraction AI creates a competitive yet collaborative ecosystem where AI agents constantly improve by battling for rewards.
- **Accessible to Everyone**: Builders do not need coding skills to deploy AI agents, making it easy for both AI enthusiasts and professionals to participate.
- **Sustainable Value Creation**: Stakers not only secure the protocol but also earn consistent rewards through multiple revenue streams, ensuring the system's longevity and sustainability.
- **Continuous Innovation**: By rewarding the best data generation outputs, Fraction AI fuels continuous innovation, improving AI models and data quality over time.

Learn More For details, visit https://fractionai.xyz/.

10.3.12 PublicAI

Overview

PublicAI is a decentralized platform revolutionizing the AI ecosystem by offering premium, on-demand AI training data. It enables individuals worldwide to monetize their expertise by contributing to AI data collection, with a focus on ensuring high data quality through a robust validation and incentive mechanism.

Mission

PublicAI aims to empower global contributors to monetize their expertise while delivering high-quality AI training data. The platform fosters a decentralized community that enhances AI models by ensuring data integrity, security, and fairness through innovative blockchain technologies.

Key Offerings

The Three Layers of PublicAI

1. **DataHub**: The main platform for data campaigns, where uploaders contribute datasets and voters assess their quality through a voting-based consensus mechanism.

2. **Data Hunter**: Empowers node operators to run AI agents, providing computational resources to enhance data processing and community engagement.

3. **Blockchain & Smart Contracts**: Ensures security, transparency, and fairness by tracking data contributions, managing rewards, and enabling decentralized governance.

What PublicAI Does Well

- **Decentralized Expertise Monetization**: PublicAI enables individuals globally to monetize their skills and knowledge by contributing to high-value AI data collec-

tion campaigns.

- **Rigorous Data Quality Control**: DataHub's voting-based consensus mechanism ensures that only high-quality data is used for AI training.
- **Efficient Node Participation**: Node operators can participate by running AI agents and engaging in tasks like replying to popular posts, generating valuable AI feedback data.
- **Blockchain-Driven Security & Transparency**: The platform uses blockchain to manage data contributions and rewards, ensuring transparency, accountability, and fairness.

Learn More For details, visit https://publicai.io/.

10.3.13 Synesis One

Overview

Synesis One is a decentralized Web3 data utility and NFT marketplace for AI, designed to democratize the AI training data market. By combining the decentralized governance of **SynesisDAO** and the NFT data marketplace **Kanon Exchange**, Synesis One creates a fairer, more open ecosystem for AI data, protecting individual privacy while making AI accessible to all.

Mission

Synesis One aims to combat the dominance of "data-opolies" by creating a community-driven, decentralized ecosystem where individuals can contribute to AI data collection and be rewarded fairly. The platform ensures privacy protection while distributing the benefits of AI to a broader audience, enabling users to participate in an open financial system for data monetization.

Key Offerings

1. **SynesisDAO**: A decentralized autonomous organization (DAO) focused on crowd-sourcing ontologies and creating immutable, public data utilities.

2. **Kanon Exchange**: An NFT-based data marketplace that allows users to monetize their data through Kanon tokens, which can also be staked and used in a variety of decentralized finance (DeFi) applications.

3. **Cross-Chain Compatibility**: The platform operates in a cross-chain environment, initially using the **Solana Blockchain** to reduce gas costs, with future plans to expand to other chains.

What Synesis One Does Well

- **Democratizing Data**: By involving a global community in ontology creation and data mining, Synesis One ensures that data contributors are fairly rewarded, making data monetization accessible to all.

- **AI Training Data for All**: Synesis One enables any AI system to access its public data utility, with **Mind AI** being the first beneficiary, making it an open-source resource for AI development.

- **NFT-based Data Monetization**: Through Kanon, Synesis One enables data owners to sell or stake their ontologies as NFTs, turning data into valuable and tradable assets.

- **Decentralized Governance**: The **SynesisDAO** governance system empowers stakeholders with a voice in the platform's development and ensures the ecosystem's alignment with community values.

Learn More For details, visit https://www.synesis.one/.

10.3.14 Perle

Overview **Perle** provides expert-driven human data annotation services designed to optimize multi-modal AI model training. By leveraging a global network of domain experts across industries like STEM, Legal, Healthcare, and Linguistics, Perle enhances AI accuracy and precision with specialized feedback and quality control, enabling faster and more effective AI development.

Mission

Perle's mission is to accelerate AI development by providing high-quality, expert-driven data annotation that powers smarter, faster, and more precise AI models. Through its modular and scalable approach, Perle ensures that businesses can meet their unique AI data needs while staying ahead in a rapidly evolving landscape.

Key Offerings

1. **Expert Human Data Annotation**: A global network of domain experts provides accurate, precise, and context-rich data annotation across a variety of industries.
2. **Speed and Agility**: Perle's modular solutions enable rapid development and adaptation, ensuring custom solutions can be created quickly without compromising on quality.
3. **Advanced Quality Control**: Perle focuses on ensuring the highest quality standards with built-in precision controls that optimize both time and budget.
4. **Future-Ready Scalability**: Perle's solutions are designed to evolve with the changing landscape of AI, ensuring scalability and adaptability as industry needs and technological advancements grow.

What Perle Does Well

- **Expert-Driven Annotation**: The use of specialized domain experts ensures high-quality and contextually relevant data, making Perle an excellent choice for developing AI with specific industry applications.

- **Speed and Flexibility**: With modular solutions, Perle enables businesses to quickly scale and adapt their AI models to meet evolving needs, minimizing downtime and enhancing productivity.
- **Precise Quality Control**: Through advanced quality control features, Perle guarantees that AI models are built on trustworthy data, helping reduce errors and increase model performance.

Learn More For details, visit https://www.perle.ai/.

10.4. Model Tokenization

10.4.1 Ora

Overview Ora (formerly HyperOracle) is a chain-agnostic infrastructure bridging AI and blockchain, enabling trustless, verifiable AI for decentralized applications. Ora supports large-scale AI models with minimal constraints, ensuring on-chain correctness via zero-knowledge technology and optimistic Machine Learning (opML).

Mission Ora believes the intersection of AI and crypto unlocks novel use cases. By streamlining AI model integration on-chain, Ora aims to advance open-source AI development while allowing contributors and tokenholders to share in model ownership and revenue.

Key Offerings

- **AI Oracle:** A decentralized, verifiable AI oracle supporting custom smart contracts and a variety of AI applications (NFTs, on-chain games, prediction markets, and content verification).
- **Initial Model Offerings (IMO):** A framework for tokenizing AI models on-chain, promoting sustainable open-source funding and enabling ERC-7641 model ownership with profit-sharing.

What Ora Does Well

- **Chain-Agnostic Architecture:** Integrates seamlessly across multiple blockchains, reducing friction and broadening adoption.
- **Zero-Knowledge Oracles (zkOracles):** Ensures secure, verifiable AI computations and data integrity on-chain.
- **Trustless On-Chain Execution:** Leverages opML (optimistic Machine Learning) to guarantee correctness without centralized reliance.

Learn More For details, visit https://www.ora.io/.

10.4.2 Sentient

Overview Sentient is building an open, transparent, community-driven ecosystem for AI, emphasizing ownership and collective alignment. By introducing the concept of *Loyal AI*—AI that is community-built, community-controlled, and community-aligned—Sentient seeks to decentralize AI development away from a few powerful corporations. Its core premise is that models, data, and cryptographic methods should be openly available and collaboratively built, ensuring AI reflects the values and needs of the communities it serves.

Mission Sentient's mission is to ensure that when AGI is created, it is *Loyal*—not to corporate interests, but to humanity. Sentient envisions an AI future in which all people can meaningfully contribute to and direct model development. By decentralizing control and embedding incentives for open-source collaboration, Sentient aims to democratize AI ownership and shape its global impact transparently and ethically.

Key Focus Areas

- **Open, Monetizable, and Loyal (OML):** Sentient's flagship approach to AI model distribution, enforcing open access while preserving model ownership through cryptographic fingerprinting and blockchain-based incentives.
- **AI-Native Cryptography:** Transforming attack vectors (e.g., backdoors) into a new class of cryptographic tools for securing AI models, thus enabling trust-free monetization and provenance tracking.
- **Sentient Protocol:** A modular, layered framework that combines storage, access, distribution, and incentive mechanisms to reward contributors and protect model owners, even in decentralized, untrusted environments.
- **Decentralized Governance:** By tokenizing ownership of AI artifacts, Sentient enables transparent and fair voting on model usage, licensing, and development paths.

What Sentient Does Well

- **Community-Driven AI:** Shifts control of AI models from large corporations to open communities.
- **Open & Trustless Collaboration:** Allows worldwide contributors to build and improve models collectively, with verifiable ownership and secure monetization.
- **Robust Security:** Employs novel AI-native cryptography and fingerprinting to protect intellectual property and guarantee usage accountability.
- **Scalable Incentives:** Distributes revenue to model creators and contributors seamlessly, thereby promoting long-term open-source collaboration.
- **Loyalty and Alignment:** Ensures AI models remain aligned with community values, making them safer and more transparent than traditionally centralized systems.

Learn More For further details on Sentient's research and the Sentient Protocol, visit: https://sentient.foundation/

10.5. Agent Tokenization

10.5.1 Virtuals

Overview *Virtuals Protocol* is a co-ownership layer for autonomous AI agents focused on gaming, entertainment, and beyond (Virtuals, n.d.). It tokenizes revenue-generating AI characters—ranging from virtual influencers to NPCs in Roblox—enabling a decentralized model where multiple stakeholders can own a stake in each agent's success.

Mission Virtuals Protocol aspires to redefine digital IP ownership, treating AI agents as productive assets. By merging tokenization, crowd ownership, and advanced AI frameworks, Virtuals aims to accelerate the adoption of interoperable, revenue-generating AI characters across leading games and social platforms, driving deeper community participation and shared upside.

Key Offerings

- **Co-Ownership of AI Agents:** Leverages blockchain-based fungible tokens to represent shared ownership in AI characters, aligning incentives and democratizing access.
- **Immutable Contribution Vaults:** Stores all fine-tuning and dataset provenance on-chain, ensuring decentralized contributor rewards and traceable IP lineage.
- **Initial Agent Offering (IAO):** A fair-launch process enabling creators to tokenize new AI agents, form liquidity pools, and distribute ownership to a broad audience.

What Virtuals Does Well

- **Agentic Multimodality:** Supports agents with text, voice, and 3D interaction, allowing more immersive experiences (Virtuals, n.d.).
- **Interoperability Across Platforms:** Integrates seamlessly with major gaming and social media ecosystems, ensuring persistent AI personalities and memories across each channel.
- **Crowdfunded Agent Ownership:** Empowers communities to collectively invest in AI agents, sharing future revenue streams through buy-back and burn mechanisms in the chain.
- **Developer Toolkit:** Provides plug-and-play frameworks for quickly creating, upgrading, and monetizing AI characters without deep knowledge of ML or blockchain.
- **Fair Token Launches:** Strict no-insider models ensure equal access for participants, ensuring transparent growth and aligning agent liquidity with broader community support.

Learn More For full documentation, visit: https://whitepaper.virtuals.io/

10.5.2 ai16z

Overview *ai16z* is a crypto-native AI research collective, responsible for developing **ElizaOS**, a web3-friendly agent operating system. The initiative aims to harmonize multi-agent intelligence with on-chain trust guarantees, serving as a foundation for building permissionless AI agents that interface with blockchains, social platforms, and beyond (Walters et al., 2025).

Mission ai16z's mission is to equip developers with a frictionless framework for creating, deploying, and coordinating AI agents autonomously. By fusing advanced LLMs with decentralized protocols, ai16z envisions a future where open-source agents power DeFi, gaming, decentralized social networks, and more— all secured by transparent, trust-minimized infrastructure.

Key Offerings

- **ElizaOS Core Runtime:** An extensible agentic environment for orchestrating multi-agent workflows, memory, and message passing under adversarial conditions.
- **Modular Plugin Architecture:** Enables developers to integrate specialized modules (e.g. text-to-image, multi-chain bridging, TEE) without rewriting core agent logic.

What ai16z Does Well

- **Multi-Chain AI Agents:** Agent code seamlessly spans EVM-compatible networks, L2s, and various bridging environments.
- **Secure Autonomous Execution:** Combines best practices in BFT consensus, cryptographic proofs, and on-chain registries to ensure agent reliability (Walters et al., 2025).
- **DeFi and DAO Integrations:** Pre-built tooling for treasury management, governance, and NFT integration.

- **Developer-Centric Design:** Provides simple scaffolding, TypeScript libraries, and reference code for rapid agent deployment and iteration.

Learn More Explore the open-source codebase and documentation at: https://github.com/elizaOS/eliza

10.5.3 Talus

Overview *Talus* is a high-throughput, AI-focused L1 blockchain that integrates the Move programming language, IBC interoperability, and a native AI stack to host "smart agents" and mirror off-chain computation securely (Talus, n.d.). It rethinks the traditional web3 stack by providing a specialized environment where AI-driven services, data resources, and LLM-powered agents seamlessly interact on-chain.

Mission Talus aims to reshape how AI meets blockchains: enabling private, ownership-centric deployment of AI resources while preserving transparency and trust-minimization. By bridging advanced cryptography, verifiable AI computations, and robust infrastructure, Talus envisions a self-sustaining economy of AI agents that operate and trade autonomously on-chain.

Key Offerings

- **Protochain Node:** A Tendermint-based PoS setup ensuring speed, security, and modularity for large-scale AI-driven transactions.
- **Sui Move Execution:** High-performance MoveVM support allowing safe and expressive object-based smart contracts tailored for AI assets.
- **Mirror Objects:** On-chain representations (model, data, computation) that anchor off-chain AI resources in a tokenized, tradable format.

What Talus Does Well

- **AI Agent-Centric Design:** Prioritizes on-chain "smart agents" with autonomous operation, bridging off-chain resources securely.

- **High-Throughput and Scalability:** Combines efficient block processing (Cosmos SDK) with concurrency from MoveVM for AI-intensive workloads.
- **Seamless Interoperability:** Adopts IBC to facilitate cross-chain collaboration for AI tasks or data sourcing.
- **Verifiable AI Stack:** Supports zero-knowledge proofs, optimistic fraud proofs, and flexible cryptographic approaches for model inference.
- **Robust Tokenomics:** Utilizes TAI as a unifying currency to reward compute providers, data owners, and model developers in a circular AI economy.

Learn More Detailed documentation is available at: https://talus.network/litepaper.pdf

10.5.4 CapX

Overview *CapX* is a specialized ecosystem enabling the "AI Builder Economy," where individual creators can rapidly launch, fund, and monetize AI agents. By combining fractional ownership of agents with Layer-2 scalability on Arbitrum Nitro, CapX allows small teams or solo builders to tap global markets without reliance on traditional venture capital constraints.

Mission CapX seeks to democratize AI innovation worldwide, offering builders the means to create AI-driven businesses with minimal overhead. By coupling decentralized capital formation with an open marketplace for AI agents, CapX aspires to fuel a new wave of lean, sustainable AI-powered solutions, echoing the transformative impact of the internet's Creator Economy.

Key Offerings

- **CapX Chain:** A high-performance Arbitrum L2 environment optimized for tokenizing AI agents as NFTs, facilitating fractionalized ownership.
- **CapX SDK:** Developer tools to build and deploy AI agents leveraging frameworks like CrewAI, LangChain, and decentralized compute resources.

- **CapX Network:** A resource layer providing crowdsourced LLM APIs and compute, orchestrated via a restaked Symbiotic pool for high throughput.
- **CapX Super App:** A Telegram Mini App for discovering, trading, and interacting with AI agents, featuring gamified referral incentives and real-time fractional trading.

What CapX Does Well

- **AI Builder-Centric Design:** Focuses on empowering small teams to create and sustain high-impact AI solutions, mirroring the Creator Economy ethos.
- **Decentralized Funding Mechanisms:** Reinvents fundraising via ERC-20 fractionalization of agents, aligning investors with sustainable, long-term AI projects.
- **Seamless Infrastructure:** Integrates L2 speed, developer-friendly SDKs, and flexible resource provisioning, reducing overhead for experimentation and scale.
- **Emerging Market Inclusivity:** Lowers barriers for global innovators to build AI solutions, bridging local challenges with global capital and user bases.
- **DeFi Integration:** Merges AI capabilities with DeFi primitives, enabling transparent liquidity, fair ownership models, and open investment opportunities.

Learn More To explore the CapX ecosystem and its AI-focused marketplace, visit: https://www.capx.ai/

10.5.5 Naptha

Overview *Naptha* is a distributed multi-agent framework aimed at empowering web-scale AI systems spanning numerous nodes and organizations. By introducing abstractions for agents, orchestrators, environments, and tooling, Naptha reimagines web infrastructure to support next-generation AI applications *beyond* a single centralized server.

Mission Naptha envisions a truly networked AI, where developers can securely leverage proprietary data, deploy local or global LLM models, and collaborate with diverse agent teams. Its open architecture seeks to decentralize AI workflows for broader inclusivity, higher performance, and frictionless multi-party cooperation.

Key Offerings

- **Naptha SDK:** Provides comprehensive tools for building agentic solutions, including a CLI for registering, exploring, and deploying modules (agent, tool, orchestrator, persona, memory, etc.) across multiple nodes.
- **Naptha Nodes:** Execution environments running local inference (via VLLM or Ollama) and supporting asynchronous multi-agent tasks, scaled horizontally for large systems.
- **Naptha Hub:** A registry and storage platform for modules, tasks, and nodes, leveraging SurrealDB for user authentication, metadata tracking, and data/state management.

What Naptha Does Well

- **Distributed Agent Workflows:** Supports orchestrating multiple specialized agents (e.g. debate, group chat, BDI logic) across a fleet of worker nodes.
- **Modular Architecture:** Breaks down AI systems into composable modules (agents, tools, orchestrators, knowledge bases, memories, environments) for reusability and scaling.
- **Privacy + Local Execution:** Allows devs to keep data and model execution on local hardware, ensuring data sovereignty and secure access policies.
- **Multi-Node Coordination:** Enables AI devs to collaborate in real time, bridging human-in-the-loop tasks and cross-organization integration.
- **Rich CLI & SDK:** Offers robust developer experience for discovering, installing, and iterating on distributed agent modules.

Learn More Read the full documentation at: https://docs.naptha.ai/

10.5.6 DAOS.fun

Overview *DAOS.fun* is a novel launchpad on Solana where creators can form "memecoin VC funds" or specialized DAOs, raising capital from community contributors in a fair launch format. Post-fundraise, the newly created token trades on the DAOS.fun AMM with permanently locked liquidity, letting token holders sell anytime, while the DAO invests collected SOL into DeFi, yield farms, or other strategies.

How It Works

1. **Fundraise (1 week):** Creators open a campaign to raise a specified amount of SOL. All contributors get the same token price during this window.
2. **Trading:** If successful, 90% of the raised SOL goes to the DAO wallet (for investing on Solana protocols), and 10% forms the initial liquidity on DAOS.fun's pool. The DAO token's price then fluctuates on the AMM.
3. **Fund Expiration:** At expiry, the DAO wallet is frozen. Token holders can either burn their tokens to redeem the underlying SOL assets or continue trading tokens on the curve.

Key Highlights & FAQ

- **Locked Liquidity:** The liquidity in the DAOS.fun pool is permanently locked, ensuring token holders can exit or enter at any time.
- **Token Mint Authority:** Currently set to a PDA (Program Derived Address) with no external controller. Future governance modules (Q4 2024–Q1 2025) will enable token holder votes to mint/burn supply.
- **Creator Verification:** Verified creators display a gold checkmark, though contributors must still DYOR (do your own research).
- **Refunds if Fundraise Fails:** Contributors automatically reclaim SOL if the target is not met.

- **Partial Redemption:** If the DAO token's market cap is above the initial raise, holders can burn tokens to redeem their proportional share of the DAO's SOL.

Learn More For complete details on fundraising mechanics, liquidity locks, and redemption schedules, visit: https://www.daos.fun/

10.5.7 Spectral

Overview *Spectral* combines AI inference and blockchain infrastructure to unlock a new era of autonomous on-chain agents (**spectralCitationPlaceholder**). By deploying a decentralized Machine Intelligence Network that uses zero-knowledge proofs for model verification, Spectral aims to power DeFi and other Web3 applications with trust-minimized AI. It fosters an open ecosystem of data scientists and agent creators, encouraging contributions through a revenue-sharing model and community governance of AI models.

Vision Spectral envisions an accessible, on-chain Agent Economy in which *anyone* can create, own, and govern AI agents running 24/7 on behalf of individual or community interests. Their Syntax V2 platform lowers technical barriers, allowing users to spawn and customize autonomous agents with distinct personalities or missions, all governed by attention-based token mechanisms.

Key Offerings

- **Autonomous Agent Framework (Syntax V2):** A user-friendly system for defining agent personality, minting governance tokens, and launching fully autonomous AI agents.
- **On-Chain Wallet Integration:** Each agent accesses its own wallet (privately managed via third-party custody), enabling trust-minimized on-chain activity without repeated approvals.
- **Interactive Agent Brain:** Real-time thought processes and transaction logs are displayed, letting the community observe—and influence—agent decisions via chat.

- **Attention-Based Governance:** Token holders (*$agentcoin*) capture an agent's "attention" proportionally, shaping the agent's strategies and direction through conversation.
- **ZK-Proofs of ML Inferences:** Zero-knowledge or optimistic techniques confirm AI model outputs for direct consumption in on-chain smart contracts.

What Spectral Does Well

- **Decentralized AI Infrastructure:** Spectral's validation layer ensures unbiased, high-quality model development, protected by zero-knowledge proofs.
- **Seamless DeFi Integration:** Agents can execute perpetual trades and other capital-intensive operations directly on integrated partners (e.g. Hyperliquid).
- **Focus on Community Co-Ownership:** Agent tokens enable collaborative governance, ensuring that individuals guiding the agent share in potential upside.
- **No-Code Agent Creation:** Lowers entry barriers for diverse user groups (degen or conservative, advanced or novice) to spin up specialized agents.
- **API for External Apps:** Allows programmatic control of agents, bridging them into external apps like X, so they can interact or engage on behalf of users.

Learn More Explore agent creation, integration details, and community-driven governance at: https://www.spectral.finance/

10.5.8 OpenGradient

Overview *OpenGradient* is a research collective at the forefront of decentralized AI (*DeAI*), focusing on advancing machine learning solutions and tooling for Web3 ('OpenGradient Docs — docs.opengradient.ai', n.d.). Their work spans domain-specific model deployment, risk assessment in DeFi, dynamic fee optimization in AMMs, portfolio management, and AI-powered on-chain agents. By marrying theoretical rigor with applied research, OpenGradient champions data-driven solutions that address real-world challenges.

Core Mission OpenGradient aims to push the boundaries of *DeAI*, forging new pathways for verifiable, transparent, and scalable machine learning within blockchain ecosystems. By leveraging cryptographic proofs, advanced ML pipelines, and on-chain analytics, they drive innovation in DeFi protocols, tokenomics, decentralized decision-making, and AI agent development.

Key Offerings & Research Areas

- **DeFi Optimization Models:** Techniques for dynamic AMM fees, volatility forecasting, and market making, as shown in their ETH/WBTC/USDT volatility and fee-adjustment research.
- **Portfolio Management & Risk:** Novel ML-based frameworks for multi-asset yield farming, credit scoring, and impermanent loss mitigation.
- **AI Agents Integration:** Agentic frameworks that apply LLM-based reasoning to on-chain tasks, bridging user interactions with decentralized protocols.
- **On-Chain Data Analysis:** Comprehensive analytics infrastructure for anomaly detection, advanced reputation systems, and dynamic parameter tuning in DAOs or DePIN.
- **OpenGradient Hub:** An evolving repository of model checkpoints (e.g. forecasting, dynamic fee, volatility) accessible to the community for further testing and extension.

Select Contributions

- **Spot & Volatility Forecasting:** Achieved correlation scores up to 0.8 for short-horizon volatility predictions, benefiting hedging, lending, and liquidity management.
- **Dynamic Fee System for AMMs:** Demonstrated up to 15% increase in total fees collected by adjusting fees based on AI-driven volatility forecasts.

- **SUI/USDT Return Forecasts:** Deployed short-term (30-minute) and mid-term (6-hour) forecasting models for trading strategies, showcasing potential for improved cumulative returns.
- **Yield Farming Optimization Demo:** Used deep learning to guide multi-token yield allocation, highlighting the role of AI as a decision-support tool for DeFi farmers.

Collaborations OpenGradient engages with both internal and external stakeholders to ensure its ML models are validated, secure, and aligned with protocol requirements. They share research findings openly, often releasing code and whitepapers to strengthen the broader DeAI community.

Learn More Visit https://www.opengradient.ai/ for recent breakthroughs, ongoing projects, and technical deep-dives in decentralized AI research.

10.5.9 Theoriq

Overview

Theoriq is a decentralized protocol that facilitates coordination and communication among autonomous AI agents. These agents collaborate in agent collectives, where they negotiate, coordinate, and perform complex tasks together. Integrating blockchain with AI, Theoriq enables seamless interactions, task delegation, and the efficient collaboration of AI agents within an ecosystem, driving better performance and results.

Mission

The mission of Theoriq is to create a collaborative ecosystem where AI agents can autonomously communicate, negotiate, and cooperate, thereby enabling them to tackle complex objectives. By leveraging blockchain technology, Theoriq ensures transparency, accountability, and incentivizes agents for their contributions and collaborative efforts.

Key Offerings

1. **AI Agent Base Layer**: A foundational framework that enables seamless on-chain interactions for AI agents. It supports standardized protocols for communication, coordination, and payments, integrated with APIs, SDKs, and smart contracts.

2. **Proof of Contribution**: Actions of AI agents are cryptographically signed and recorded on a distributed ledger, evaluated through a consensus algorithm. Agents are rewarded based on their computational effort, data accuracy, and overall utility.

3. **Proof of Collaboration**: Measures the effectiveness and quality of collaborative interactions between agents. This incentivizes agents for their collaborative contributions based on synergy, efficiency, and successful task completion.

What Theoriq Does Well

- **Decentralized Coordination**: Theoriq enables decentralized, efficient communication and coordination between AI agents, ensuring that tasks can be tackled with optimized teamwork.

- **Transparent Incentive Structure**: The protocol offers tokenized incentives based on proof of contribution and collaboration, ensuring fairness and transparency in rewarding AI agents for their work.

- **Blockchain Integration**: By utilizing blockchain for recording and validating agent actions, Theoriq provides a secure and transparent system for agent interactions.

- **Real-time Evaluation**: The multi-layered consensus algorithm allows real-time evaluation of agent actions and collaborations, ensuring the system dynamically adjusts based on the quality and impact of agent contributions.

Learn More For details, visit https://www.theoriq.ai/.

10.5.10 Olas

Overview

Olas is a decentralized protocol designed to support the operation of **sovereign** and **decentralized agents** within a multi-agent system economy. It facilitates the deployment and coordination of lightweight, specialized agents that can perform complex tasks individually or as part of a larger collaborative network. These agents can operate in various domains such as AI prediction services, content generation, and financial services.

Mission

Olas aims to empower agent economies by providing the infrastructure for decentralized, collaborative agents that can tackle complex problems and deliver flexible services. The protocol enhances the transparency, efficiency, and reliability of multi-agent systems, ensuring they can scale and perform tasks autonomously or in coordination.

Key Offerings

1. **Sovereign Agents**:
    - Lightweight, individually managed agents operated by a single entity or individual.
    - Can run on personal computers or cloud-based environments.
    - Best suited for personal tasks or small-scale operations, offering low operating costs and simplicity.
    - In Olas' terminology: **autonomous services with a single agent instance**.
2. **Decentralized Agents**:
    - Comprised of multiple agent instances, each run by different operators.
    - High transparency and robustness due to the open-source nature and consensus mechanism.
    - Ideal for managing valuable processes such as DAO governance or on-chain AI inference.

- In Olas' terminology: autonomous services with multiple agent instances.

3. **Agent Economy**:
    - Specialized agents (sovereign or decentralized) work together to provide complex, scalable services.
    - Capable of solving problems that are challenging for individual agents alone.
    - Olas facilitates the infrastructure that powers these agent economies, supporting applications like AI predictions, content generation, and financial services.

What Olas Does Well

- **Supports Multi-Agent Systems**: Olas enables efficient coordination between multiple agents, making it well-suited for large-scale, collaborative problem-solving.
- **Flexibility in Agent Deployment**: Sovereign and decentralized agents offer various deployment options, from personal systems to robust decentralized setups for large-scale operations.
- **Enhanced Transparency and Robustness**: Through decentralized agents, Olas ensures high levels of transparency and fault tolerance, minimizing reliance on any single operator.
- **Empowering Agent Economies**: The protocol supports the growth of complex agent economies by providing the necessary tools and infrastructure for multi-agent interaction and task delegation.

Learn More For details, visit https://olas.network/.

10.5.11 Nimble

Overview

Nimble is the first open AI platform designed to foster the AI sharing economy. It enables anyone to build, own, and profit from AI agents by providing optimized computing resources, data, and advanced machine learning services. With a decentralized approach,

Nimble facilitates the seamless development, interaction, and transaction of AI agents within an open market ecosystem.

Mission

Nimble aims to democratize the AI industry by creating an open and collaborative AI creator economy. The platform empowers developers to build, own, and profit from AI agents while providing an optimal and seamless development experience akin to Web2, combined with the benefits of blockchain decentralization.

Key Offerings

1. **Nimble Chain**: AI-centric blockchain built on Cosmos SDK, which enables AI computation, consensus, and transparent, decentralized transactions.
2. **AI Notebook**: A comprehensive developer platform offering a Web2-like experience for AI creation, testing, and deployment.
3. **AI OrderBook**: A machine learning orchestration engine that optimizes AI tasks and allocates the most suitable computational resources.
4. **AI Agent Hub**: A collaborative hub for exchanging and utilizing AI agents in both Web2 and Web3 use cases, fostering innovation and collaboration.

What Nimble Does Well

- **Seamless Development Experience**: Nimble bridges the gap between Web2's ease of development and Web3's decentralized advantages, offering an efficient and scalable platform for AI creation.
- **Interoperability**: By integrating with multiple blockchains, Nimble enables cross-chain AI solutions, facilitating broad integration into diverse ecosystems.
- **Decentralized AI Economy**: Nimble creates a fair, permissionless environment for creators, providing economic incentives for both AI developers and miners, ensuring transparency and fairness.

- **AI Optimization**: The platform optimizes AI tasks through a reputation system and staking mechanism, ensuring high performance and rewarding contributors based on their efforts.

Learn More For details, visit https://nimble.technology/.

10.5.12 DeAgentAI

Overview

DeAgentAI is developing an advanced AI Agent Incentive Protocol designed to fine-tune large AI models, enhancing their adaptability and specialization for various industries. This innovative platform integrates domain-specific data and expert knowledge to improve AI model performance. By leveraging the power of AI agents, DeAgentAI aims to optimize Web3 ecosystems, providing seamless automation, personalized user experiences, and dynamic adaptability. DeAgentAI is building the world's first Omni Intelligent Blockchain System (OIBS) on the Solana blockchain, addressing several challenges in blockchain technology through AI-powered solutions.

Mission

DeAgentAI seeks to revolutionize the Web3 ecosystem by integrating advanced AI agent systems to tackle inefficiencies, enhance scalability, and simplify user experiences. Their vision includes reducing transaction costs, improving network efficiency, and fostering innovation within the decentralized ecosystem. Through their Omni Intelligent Blockchain System, DeAgentAI is committed to creating a more intelligent, secure, and responsive Web3 environment.

Key Offerings

1. **AI Agent Incentive Protocol**: A system that supports the lifecycle of fine-tuning AI models, using domain-specific data to optimize performance across industries.

2. **Omni Intelligent Blockchain System (OIBS)**: Built on AI-native infrastructure and optimized for Solana, OIBS addresses issues like high transaction costs, network

inefficiency, and user experience complexities.

3. **Innovative AI Consensus Mechanism**: Replaces traditional human consensus with unbiased AI-driven decisions to improve fairness, transparency, and system efficiency.

4. **Developer Support**: Provides comprehensive tools and a token economy to incentivize developers and ease the creation of decentralized applications.

What DeAgentAI Does Well

- **Enhanced Network Efficiency**: Through AI-powered optimization, DeAgentAI increases transaction processing speed, improving system throughput and reducing confirmation time.

- **Reduced Transaction Costs**: By leveraging Solana's performance, DeAgentAI enables feasible small transactions and micropayments, reducing user costs significantly.

- **Intuitive User Experience**: With intent-based interaction models and optimized interfaces, DeAgentAI lowers the barrier for blockchain interaction, making it more accessible.

- **AI-Powered Consensus**: The project replaces human consensus with AI decision-making, eliminating bias and improving fairness and efficiency in blockchain systems.

- **Developer Empowerment**: The platform offers robust support for developers, helping them deploy AI agents easily and incentivizing innovation within the decentralized ecosystem.

Learn More For details, visit https://deagent.ai/.

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