

# Axonomy: Architecting the Protocol for On-Chain Value Exchange

## I. The Web3 Advertising Revolution: A Paradigm Shift from Extraction to Empowerment

### 1.1 Deconstructing the "Axonomy" Vision: Leveraging x402 for a Fairer Ad Ecosystem

The conceptual foundation of the Axonomy protocol is embedded in its original name concept—a strategic fusion of "advertising" and the long-dormant HTTP 402 "Payment Required" status code.<sup>1</sup> This is not merely a branding choice; it is the guiding architectural principle. The x402 protocol, developed by Coinbase and supported by industry leaders like Cloudflare, revives this status code to create a standardized, web-native mechanism for on-chain payments.<sup>2</sup> Axonomy harnesses this standard to reimagine digital advertising, treating every interaction—be it an ad impression, a user click, or a verified on-chain conversion—as a discrete, monetizable resource request that can be programmatically settled in real-time.

The core purpose of the x402 protocol is to facilitate frictionless, per-request micropayments without the burdensome overhead of user registration, subscriptions, or complex signature schemes.<sup>4</sup> This makes it exceptionally well-suited for the high-volume, low-value transactions that characterize the advertising landscape. By building an ad network on this rail, Axonomy can enable direct, peer-to-peer value transfer between advertisers, publishers, and users, effectively creating a more equitable and efficient ecosystem.<sup>6</sup>

### 1.2 The Problem Axonomy Solves

The contemporary digital advertising landscape, dominated by a few centralized behemoths, is fundamentally broken for all participants. Its business model is predicated on what has been termed a "vampiric monetization model," which involves the pervasive surveillance of users and the harvesting of personal data to be sold to the highest bidder.<sup>1</sup> This system is plagued

by inefficiencies, including rampant ad fraud, a lack of transparency in reporting, and the presence of rent-seeking intermediaries that capture a significant portion of ad spend, reducing the revenue that reaches actual content creators.<sup>8</sup>

Axonlayer is a revolutionary advertising platform that directly solves these problems by enabling direct advertiser-to-publisher payments using the x402 protocol.

**For Publishers (dApps, Websites, Content Creators):** The platform addresses the challenges of slow payments, high fees, and lack of control.

- **5-Minute Integration:** Publishers can monetize their websites almost instantly by adding a simple script tag and div elements.
- **Instant Payments:** Revenue is paid in real-time via blockchain micropayments directly to the publisher's wallet.<sup>8</sup>
- **No Middlemen:** By removing intermediaries, publishers keep 93-95% of ad revenue, a dramatic increase from the 50-70% typical in traditional networks.
- **Complete Control:** Publishers have the power to set their own prices and define their own content moderation levels.

**For Advertisers:** The platform removes the friction and opacity of traditional ad buying.

- **Direct Placement:** Advertisers can place ads directly on publisher sites without going through complex, lengthy, and often biased approval processes.
- **Pay-Per-View Efficiency:** Campaigns are based on a pay-per-view model, ensuring advertisers only pay for actual ad engagement.
- **Global Reach & Instant Publishing:** Ads can be published instantly with no geographic restrictions after the on-chain payment is confirmed.

This creates a win-win-win scenario where publishers earn more with instant payouts, advertisers get direct access and fair pricing, and the platform earns sustainable fees while disrupting a massive industry.

## 1.3 Core Principles of a Decentralized Ad Protocol

To fulfill its vision, the Axonlayer protocol will be architected around three inviolable principles:

1. **Radical Transparency:** Every core economic activity within the protocol—from the initial funding of an ad campaign by an advertiser to the final payout to a publisher or user—will be executed as a transaction on the Base blockchain. This creates a permanent, publicly auditable trail, providing all participants with unprecedented visibility into the flow of funds and campaign performance metrics.<sup>8</sup>
2. **Privacy by Design:** The protocol will pioneer a new model of audience targeting that

moves away from the personal identifiers of Web2. Instead of tracking names, emails, or device IDs, targeting will be based on anonymized, on-chain data, such as wallet holdings, transaction patterns, and interactions with other dApps. Advanced cryptographic techniques will be employed to ensure that users can be part of a targetable audience segment without revealing their individual identity.<sup>10</sup>

3. **User as a Participant, Not a Product:** The platform fundamentally rebalances the power dynamic of digital advertising. Users are elevated to the status of first-class participants who can grant or revoke access to their data and be compensated directly for their attention. This opt-in model fosters a more respectful and sustainable relationship between brands and consumers.<sup>7</sup>

## 1.4 Market Opportunity Analysis: Identifying the Niche for a Premier Ad Platform on Base

The digital advertising market is a \$500B+ industry, but it is rife with problems like 30-50% intermediary fees, delayed payments, and complex setups. Axonlayer's solution of 2-5% fees, instant on-chain payments, and a 5-minute setup directly addresses this massive market inefficiency.

The Web3 advertising landscape is nascent but growing, with several platforms attempting to solve the challenges of on-chain marketing. Existing crypto ad networks like Adshares, Blockchain-Ads, Bitmedia, and A-Ads have made inroads by connecting crypto-native projects with relevant publishers.<sup>8</sup> However, these platforms often operate on proprietary blockchains, are fragmented across multiple chains, or rely on traditional Web2 payment and ad-serving technologies.

Axonlayer possesses a unique and defensible competitive advantage by being built as a native protocol on Base. This strategic choice confers several powerful benefits:

- **Ecosystem Integration:** As an L2 incubated by Coinbase, Base provides unparalleled access to a vast and growing ecosystem of users, developers, and liquidity. The ability to natively integrate with core Base infrastructure like Base Account and Basenames creates a frictionless experience that is difficult for external networks to replicate.<sup>17</sup>
- **Low Cost and High Throughput:** Base offers sub-second transaction times and sub-cent fees, making it the ideal environment for the high-frequency micropayments required for an at-scale advertising protocol.<sup>17</sup>
- **Focus on Agentic Commerce:** Base and Coinbase are actively promoting the vision of an on-chain economy powered by autonomous AI agents.<sup>19</sup> By building on the x402 protocol—the designated payment rail for this agent economy—Axonlayer positions itself at the epicenter of this next technological wave, moving beyond human-centric

advertising to machine-to-machine commerce.<sup>6</sup>

The true innovation of Axonlayer lies in its potential to evolve beyond a simple advertising network into a **programmable attention market**. The current Web3 advertising model is advancing from tracking impressions to verifying on-chain actions, as seen in platforms that reward users for completing specific tasks.<sup>10</sup> Concurrently, the x402 protocol is engineered for programmatic, machine-to-machine payments for discrete services.<sup>6</sup> By synthesizing these two concepts, Axonlayer can redefine an "advertisement" as a smart contract-triggered incentive. In this model, an advertiser does not merely pay for a click; they deposit funds into a smart contract that programmatically pays a user upon the successful and verifiable completion of a predefined on-chain action, such as "staking in a protocol for 30 days," "minting a specific NFT," or "casting a vote in a DAO proposal." This architectural shift transforms the platform from a niche ad network into a generalized protocol for on-chain user acquisition and engagement—a significantly larger and more valuable market.

To strategically position Axonlayer, the following table provides a clear, data-driven comparison against existing players, highlighting the platform's unique value proposition. This analysis is crucial for investor conversations, strategic planning, and focusing development efforts on true differentiators.

Platform Name	Underlying Technology	Payment Model	Targeting Method	Key Differentiator
<b>Adshares</b>	Dedicated L1 Blockchain	Native Token (ADS)	Contextual	Full-stack AdTech ecosystem with high TPS <sup>8</sup>
<b>Blockchain-Ads</b>	Multi-chain (37+ Blockchains)	Crypto & Fiat	On-chain Wallet Data	Cross-chain reach and deep wallet analytics <sup>13</sup>
<b>Bitmedia</b>	Centralized Network	CPM / CPC (Crypto & Fiat)	Contextual, Geo-targeting	Large network of publishers and KOL marketplace <sup>15</sup>

<b>Axonlayer (Proposed)</b>	<b>Base L2</b>	<b>x402 Micropaymen ts (USDC)</b>	<b>Privacy-Prese rving AI</b>	<b>Native to Base/Coinbas e ecosystem; built for the agent economy</b>
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This comparison makes the strategic opening for Axonlayer clear. No other platform combines the low-cost, high-throughput environment of a leading L2, a web-native micropayment standard designed for the future of the internet, and a clear roadmap toward advanced, privacy-preserving AI. The platform's revenue model is built for sustainability, based on a 2-5% fee on ad spend, with future plans for premium features like advanced targeting and enterprise-level integrations.

## II. Strategic Architecture: Building a Resilient and Scalable Ad Network

### 2.1 The Three-Sided Marketplace: Advertisers, Publishers, and Users

The Axonlayer protocol is designed as a three-sided marketplace, meticulously architected to deliver a compelling and distinct value proposition to each of its core participants. The symbiotic relationship between these groups creates a powerful network effect that drives platform growth and sustainability.

- For Advertisers:** The primary value is direct access to a high-intent, cryptographically verifiable on-chain audience with no complex approval processes. Campaigns can be targeted based on actual user behavior recorded on the blockchain, leading to more efficient ad spend and instant publishing upon payment.<sup>10</sup> The protocol's transparent nature provides fraud-resistant metrics, allowing for the calculation of true on-chain Return on Investment (ROI) based on actions like token swaps or liquidity provision, rather than vanity metrics like impressions.
- For Publishers (dApps, Wallets, Content Creators):** The protocol offers a new, powerful, and simple-to-integrate monetization stream. With a 5-minute integration via a simple script tag, publishers can immediately begin earning 93-95% of ad revenue.

Payouts are settled instantly and directly to their wallets via the x402 protocol, eliminating the delays and opaque fee structures of traditional ad networks.<sup>8</sup> Publishers also retain complete control over pricing and content moderation.

- **For Users:** The protocol fundamentally respects user sovereignty. Users can opt-in to monetize their attention, earning direct micropayments for engaging with content. Crucially, this is achieved while preserving their privacy and giving them granular control over their data. The result is a more relevant, less intrusive, and economically empowering advertising experience.<sup>7</sup>

## 2.2 Core Protocol Design: Smart Contracts and Key Features

The backbone of the Axonlayer protocol is a suite of smart contracts deployed on the Base network, combined with a robust set of features designed for a modern advertising ecosystem.

1. **Ad Auction Contract:** This contract serves as the on-chain marketplace where advertisers bid for ad space or user actions. To ensure fairness and efficiency, it can implement sophisticated auction mechanisms, such as a Vickrey auction (second-price sealed-bid), where the winning bidder pays the price of the second-highest bid. This encourages advertisers to bid their true valuation.
2. **Placement & Verification Oracle:** A critical component that bridges the on-chain and off-chain worlds. When a user views an ad on a publisher's site or completes a required on-chain action (e.g., a token swap), this event must be reliably reported to the smart contracts. This can be achieved through a decentralized oracle network (DON) that listens for specific events and triggers the payment contract upon verification, preventing fraudulent claims from either publishers or users.
3. **Payment & Escrow Contract:** This contract acts as the protocol's automated treasury. Advertisers deposit their campaign funds (e.g., in USDC) into this contract. The contract holds these funds in escrow and, upon receiving a valid verification signal from the oracle, programmatically releases the payments. The final settlement leg of this process utilizes the x402 protocol, instructing the user's or advertiser's wallet to send a micropayment to the publisher and/or the user, completing the value exchange loop.<sup>2</sup>

### Key Platform Features:

- **Multiple Ad Formats:** Support for images, HTML, and videos to accommodate diverse campaign needs.
- **Dynamic Pricing:** Implementation of time-based and demand-based pricing models to optimize ad spend and publisher revenue.
- **Content Moderation:** An AI-powered moderation system with a manual review process to ensure ad quality and brand safety.

- **Real-time Analytics:** A comprehensive dashboard for tracking campaign performance and revenue instantly.
- **Mobile Responsive:** A fully responsive design that ensures ads and dashboards work seamlessly on all devices.

## 2.3 Leveraging the Base Ecosystem: A Native Advantage

Building natively on Base provides Axonlayer with a suite of powerful tools that create a seamless and highly differentiated user experience, forming a deep competitive moat.

- **Base Account (Smart Wallets):** This is the cornerstone of the platform's user adoption strategy. Base Account abstracts away the complexities of Web3 for mainstream users by offering passkey-based security (e.g., Face ID), built-in onramps from fiat, and, most importantly, the ability for dApps to sponsor gas fees.<sup>26</sup> For an advertising platform that rewards users, this is non-negotiable. Requiring a user to pay a gas fee to claim a \$0.05 reward is a non-starter. With Base Account, the protocol can sponsor these transactions, making the experience truly frictionless.
- **Basenames:** The integration of Basenames provides a crucial layer of on-chain identity and brand trust. Advertisers and publishers can use human-readable names like brandx.base.eth instead of long, intimidating hexadecimal addresses. This enhances usability, reinforces brand identity, and reduces the risk of errors in transactions.<sup>27</sup> The platform's dashboards and user interfaces will resolve addresses to Basenames by default, creating a more professional and user-friendly environment.
- **OnchainKit:** To meet the rapid development timelines of programs like Base Batches, the frontend will be built using OnchainKit. This comprehensive toolkit provides ready-to-use, full-stack React components for essential Web3 functionalities, including wallet connection modals, avatar and name displays (which natively support Basenames), and transaction status indicators. This accelerates the development process and ensures the application adheres to the best practices and design patterns of the Base ecosystem.<sup>20</sup>
- **Coinbase Developer Platform (CDP):** The symbiotic relationship between Base and the CDP offers advanced capabilities. The platform can leverage CDP's Wallet-as-a-Service (WaaS) suite, using Embedded Wallets to seamlessly onboard new Web2 users with an email or social login, and Server Wallets for secure, automated backend processes like managing campaign funds or distributing large-scale rewards.<sup>21</sup> CDP's APIs for trading and data can further enrich the platform's functionality.<sup>31</sup>

## 2.4 The x402 Payment Rail: Enabling Real-Time, Per-Interaction



## Micropayments

The x402 protocol is the circulatory system of Axonlayer, enabling the flow of value at a granular level previously impossible with traditional payment systems. The technical flow for a rewarded ad interaction is as follows <sup>6</sup>:

1. **Request:** A user's client, operating within a publisher's dApp, requests an ad-gated resource. This could be viewing premium content, claiming an NFT, or receiving a token reward for watching a video.
2. **Challenge:** The Axonlayer protocol's backend server intercepts this request and, if payment is required, responds with an HTTP 402 Payment Required status. The response headers contain the necessary payment details: the amount, the recipient's address (the publisher or a split contract), the token (e.g., USDC on Base), and a unique reference ID.
3. **Authorization:** The user's wallet (ideally a Base Account) receives this challenge. The wallet's software parses the headers and prompts the user to approve the micropayment. For a Base Account, this signature can be authorized via biometrics and the transaction fee can be sponsored by the protocol.
4. **Retry with Payment:** The client retries the original request, this time including the signed payment authorization payload in an X-PAYMENT HTTP header.
5. **Verification and Delivery:** The backend receives the request, forwards the payment payload to a designated x402 facilitator for on-chain verification, and upon confirmation of settlement on Base, serves the requested content or reward.

This entire sequence occurs in seconds and costs a fraction of a cent, making it economically viable to monetize even the most fleeting digital interactions.<sup>17</sup> The recent announcement of the x402 Foundation by Coinbase and Cloudflare signals a strong commitment to establishing x402 as a core protocol of the internet, making early and deep integration a significant long-term strategic advantage.<sup>3</sup>

The architecture of the Axonlayer protocol can be designed from the outset to be both self-sustaining and progressively decentralized. This is achievable by programming the core Payment & Escrow smart contract to automatically divert a small protocol fee (e.g., 2-5%) from every x402-settled ad transaction into a dedicated treasury. This mechanism is transparent, automated, and scales directly with platform usage, similar to how projects like OxSplits enable on-chain revenue sharing.<sup>33</sup> This fee stream can then fund a Decentralized Autonomous Organization (DAO). The DAO's treasury, controlled by protocol token holders, can finance future development, security audits, ecosystem grants for publishers, and other growth initiatives. This creates a powerful flywheel: platform usage funds the treasury, which in turn funds activities that drive more platform usage. This model aligns with the core ethos of Web3 and builds a more resilient, community-owned protocol than a traditional venture-backed company.



### **III. Challenges Encountered During Development**

Building on the cutting edge of Web3 technology, particularly with a novel standard like x402, presented unique challenges. The primary hurdle was the practical implementation of the full x402 payment flow. While the concept is elegant, the protocol is still nascent, leading to sparse documentation and a limited number of real-world, open-source examples to reference.

Specifically, orchestrating the client-server handshake—where the server issues a 402 Payment Required challenge and the client must correctly sign and resubmit the request with the appropriate X-PAYMENT header—proved to be complex. Debugging mismatches between the server's expected payload and the client's signed authorization was difficult without a standardized set of tools.

To overcome this, we had to go back to first principles. We conducted a deep dive into the protocol's whitepaper and the ERC-3009 TransferWithAuthorization standard it leverages.<sup>5</sup> We built a local test harness with a mock server and client to simulate the entire interaction loop in a controlled environment. This allowed us to meticulously log and inspect the HTTP headers and signed payloads at each step, identify discrepancies, and refine our implementation until it was robust and reliable. This process, while time-consuming, gave us a foundational understanding of the protocol that was critical to building a functional and secure system.

### **IV. The AI Engine: From Intelligent Automation to Predictive Insight**

To achieve its vision of becoming the premier Web3 advertising platform, Axonlayer must be more than a set of smart contracts and payment rails; it must be an intelligent system. The integration of a sophisticated, multi-tiered AI engine will be the core differentiator that provides unparalleled value to advertisers and drives a powerful data network effect. This strategy moves far beyond simple AI chatbots or recipe collections<sup>34</sup> to create a deeply integrated intelligence layer.

## 4.1 Tier 1 (Foundation): AI for Ad Creation & Optimization

The foundational tier of the AI engine focuses on lowering the barrier to entry for advertisers and automating the creative process.

- **Generative AI for Ad Copy and Visuals:** This component functions as a "Generative AI for Web3 Marketing." An advertiser can simply provide a link to their project's website or dApp. The AI will crawl the site to analyze its content, identifying the project's value proposition, target audience, brand voice, and visual aesthetic. Using this context, the AI will generate a wide array of ad creatives, including compelling ad copy, social media posts, and banner visuals, all tailored to be on-brand and optimized for different ad channels.<sup>39</sup> This eliminates the need for advertisers to have in-house design or copywriting teams, making sophisticated advertising accessible to all builders.
- **AI-Powered Performance Prediction:** Before a campaign is launched, advertisers can submit their AI-generated (or manually created) creatives to a predictive scoring model. Trained on a vast dataset of historical campaign performance, this AI will analyze the creatives and provide a performance score, predicting their likely click-through and conversion rates with a high degree of accuracy.<sup>41</sup> It can offer actionable suggestions, such as "Change button color for a +10 point increase" or "This headline is likely to perform better with the 'DeFi Trader' audience." This feature saves advertisers significant time and budget that would otherwise be spent on manual A/B testing.

## 4.2 Tier 2 (Advanced): AI for On-Chain Intelligence

The second tier leverages AI to extract actionable intelligence from the rich dataset of the public blockchain, enabling targeting and security capabilities impossible in Web2.

- **Predictive User Segmentation:** This is the core of the platform's advanced targeting capabilities. The AI engine will continuously ingest and analyze on-chain data from the Base network, identifying patterns in transaction history, token holdings, dApp interactions, NFT ownership, and DAO governance participation. Using unsupervised machine learning techniques like clustering, it will group anonymous wallet addresses into behavioral segments such as "High-Volume Aerodrome Traders," "Onchain Summer NFT Collectors," "Active Farcaster Users," or "Decentralized Social Graph Influencers".<sup>10</sup> Advertisers can then target these highly specific, high-intent audience segments without ever knowing the personal identity of the users within them.
- **AI-Driven Click Fraud and Sybil Resistance:** Ad fraud in Web3 takes on new forms, such as Sybil attacks where a single entity uses thousands of wallets to illegitimately claim airdrops or ad rewards. The AI engine will be trained to detect such inorganic

activity. It can identify tell-tale on-chain fingerprints of fraudulent behavior, such as wallets being funded from a single source, executing transactions with identical timing and patterns, or interacting with a dApp in a way that no human would.<sup>45</sup> This provides advertisers with a much stronger guarantee of campaign integrity than traditional IP-based fraud detection.

- **Autonomous Ad-Buying Agents:** This feature fully realizes the agentic commerce vision of x402.<sup>19</sup> Instead of manually managing a campaign, an advertiser can deploy an AI agent with a defined budget and a clear objective (e.g., "Acquire 1,000 new users for our gaming dApp at a cost-per-acquisition of less than \$5"). This agent will then operate autonomously, programmatically participating in ad auctions, allocating the budget across different publisher dApps, and using the x402 protocol to execute real-time payments for each successful, verified conversion. The agent can optimize the campaign 24/7, reacting to market dynamics far faster than a human operator.<sup>22</sup>

### 4.3 Tier 3 (Visionary): Privacy-Preserving AI

The third and most advanced tier of the AI engine will implement cutting-edge cryptographic techniques to offer advertising that is both perfectly targeted and perfectly private.

- **Implementing "Blind Targeting" with Zero-Knowledge Proofs (ZKPs):** This represents the ultimate evolution of privacy-preserving advertising. A user can, on their own device, generate a cryptographic proof (a ZKP) that attests to a certain fact without revealing the underlying data that proves it. For example, a user's wallet could generate a proof that states, "I hold over \$10,000 worth of DeFi tokens and have made at least 50 swaps on a DEX in the last month," without revealing their wallet address, balance, or any specific transaction.<sup>47</sup> The Axonlayer protocol can then allow advertisers to target these *proofs*. The ad is served to the user who can verifiably prove they are part of the target segment, but the advertiser—and even the Axonlayer protocol itself—never learns the user's identity. This achieves what has been called "blind targeting," resolving the fundamental tension between personalization and privacy.<sup>49</sup>
- **Utilizing Federated Learning (FL) for Collaborative Ad Models:** To continuously improve the AI models for performance prediction and audience segmentation without centralizing sensitive data, the platform will employ Federated Learning. In a traditional AI pipeline, all data is collected on a central server for training. FL inverts this model. The global AI model is sent out to run on decentralized nodes (e.g., on advertisers' or publishers' own servers). These local models train on private, local data. Instead of sending the raw data back, they only send the model updates (gradients) to be aggregated into an improved global model. This allows the platform's intelligence to learn from the collective data of the entire ecosystem without any participant ever having to

expose their proprietary campaign data to others.<sup>46</sup>

The development of this multi-tiered AI engine creates a powerful and self-reinforcing data network effect. The value of any ad network is directly tied to the quality of its targeting and the ROI it can deliver to advertisers.<sup>54</sup> AI models for targeting and performance prediction improve as they are trained on more data.<sup>39</sup> The Axonlayer protocol is uniquely positioned to capture a high-fidelity dataset that links off-chain ad exposure with verifiable on-chain conversion events across a diverse range of campaigns. As more advertisers join the platform, this dataset grows, making the AI engine progressively "smarter." A smarter AI delivers better ROI, which in turn attracts more advertisers and higher ad spend. This creates a compounding competitive advantage—a virtuous cycle that becomes increasingly difficult for new entrants to overcome, as they would be starting with a less intelligent AI trained on a much smaller dataset.

## V. The Participant Experience: Designing for Value and Adoption

The success of the Axonlayer protocol hinges on its ability to provide a seamless, intuitive, and high-value experience for all three sides of its marketplace. The design of each interface must be purpose-built to abstract complexity and maximize utility.

### 5.1 The Advertiser Dashboard

The advertiser dashboard will be the command center for creating, managing, and analyzing campaigns. Its design will prioritize simplicity and power, guided by AI at every step.

- **AI-Assisted Campaign Creation:** The workflow will be streamlined and intuitive. An advertiser will begin by defining their target audience, either by selecting from the AI-generated on-chain segments (e.g., "DeFi Power Users") or by defining custom criteria. They will then set their campaign objectives (e.g., drive traffic to a dApp, increase token holders, generate TVL) and budget. The platform's generative AI will then propose a suite of ad copy and visual creatives tailored to the advertiser's project and target audience, which can be approved or edited with a single click.<sup>39</sup>
- **Verifiable On-Chain Analytics and ROI:** The dashboard will provide a real-time, transparent view of campaign performance, grounded in on-chain data. Instead of ambiguous metrics like "impressions" or "clicks," advertisers will see verifiable results

such as "Unique Wallets Connected," "Smart Contract Interactions," "Tokens Swapped," and "Value Locked." This allows for the calculation of true, indisputable on-chain ROI, providing a clear line of sight from ad spend to economic impact.<sup>24</sup>

## 5.2 The Publisher Portal

The publisher portal is designed for dApp developers, wallet providers, and content creators who wish to monetize their platforms. The primary focus is on ease of integration and transparent revenue generation.

- **Simple Monetization SDK:** Integration will be as simple as possible, ideally requiring only a few lines of code to be added to a dApp's frontend or a website's HTML. This Software Development Kit (SDK) will handle the logic for requesting ads, displaying creatives, and managing the x402 payment flow, allowing publishers to focus on their core product.
- **Transparent and Instant Revenue Reporting:** Publishers will have access to a dashboard that displays a real-time feed of their earnings as micropayments are settled on the Base network via x402. This eliminates the opaque fee structures and lengthy payout cycles (often net-30 or net-60) of traditional ad networks, providing immediate and predictable cash flow.<sup>8</sup>
- **Ad Quality and Experience Control:** To ensure publishers can maintain the integrity of their user experience, the portal will provide robust tools for filtering ad categories, blocking specific advertisers, and customizing the appearance of ad units to match their platform's design.

## 5.3 The User Value Proposition

For users, the Axonlayer protocol represents a radical departure from the exploitative nature of Web2 advertising. The value proposition is centered on empowerment, privacy, and economic benefit.

- **Earn Directly from Attention:** Users can choose to opt-in to an "attention economy." By engaging with ads or completing rewarded actions within publisher dApps, they will receive direct micropayments in stablecoins (e.g., USDC) to their Base Account. This model, popularized by projects like the Brave browser, is extended to be a native feature of the entire Base application ecosystem.
- **Granular Data Control and Privacy:** The protocol is architected to protect user privacy by default. Through the eventual implementation of technologies like Zero-Knowledge

Proofs, users will be able to participate in targeted advertising campaigns without revealing their wallet address or any personally identifiable on-chain data. They remain in full control, able to prove specific attributes about themselves (e.g., "I am an NFT holder") to receive relevant offers, without surrendering their anonymity.<sup>49</sup>

## VI. Strategic Roadmap: From Buildathon MVP to Industry Leadership

The path to establishing Axonlayer as the premier Web3 advertising platform will be executed in three distinct phases, beginning with a focused Minimum Viable Product (MVP) for the Base Batches buildathon and progressing to a full-scale, AI-driven protocol.

### 6.1 Phase 1: The Base Batches MVP (4-Week Plan)

The primary objective during the 4-week Base Batches Builder Track is to develop a functional alpha that proves the viability of the core technical mechanic and provides a compelling live demonstration. The demo flow is designed to be perfect for the ETHGlobal format, showcasing the end-to-end user journey in a clear and impactful way.

- **Live Demo Flow:**
  1. **Publisher Setup:** Begin by showing a website with empty ad slots, ready for monetization.
  2. **Advertiser Journey:** Demonstrate an advertiser clicking an empty ad slot, uploading their creative (image, video, etc.), and paying for the placement directly with a wallet like MetaMask.
  3. **Real-time Update:** The ad appears instantly on the publisher's website as soon as the on-chain payment is confirmed.
  4. **Payment Verification:** Show the successful transaction on a Base blockchain explorer to prove the settlement occurred.
  5. **Analytics Dashboard:** Conclude by displaying a real-time dashboard showing the publisher's immediate revenue and the advertiser's campaign performance metrics.
- **Technical Innovation Showcase:**
  - **x402 Integration:** The demo serves as a perfect showcase of the novel x402 payment protocol in action.<sup>2</sup>
  - **Decentralized Architecture:** The entire process operates without a central authority, highlighting the power of peer-to-peer transactions.

- **Blockchain Payments:** The use of USDC on Base demonstrates fast, low-cost, and instant settlement.<sup>17</sup>
- **Smart Contracts:** The underlying smart contracts automate the escrow and revenue distribution, ensuring trust and transparency.
- **Meeting the Base Batches Judging Criteria :**
  - **Onchain:** The entire value flow is managed by smart contracts on the Base testnet. **(Met)**
  - **Technicality:** The project will demonstrate a functioning, end-to-end implementation of the novel x402 payment protocol. **(Met)**
  - **Originality:** This will be one of the first advertising platforms built natively on the x402 standard. **(Met)**
  - **Viability & Practicality:** The MVP solves a clear monetization and user acquisition problem with a tangible business model. **(Met)**
  - **Wow Factor:** Executing a live, sub-second, on-chain payment that makes an ad appear instantly is a powerful and memorable demonstration. **(Met)**

To ensure success, the project must also fulfill all submission requirements, including a publicly accessible URL for the demo, a well-documented open-source GitHub repository, and a concise and compelling video presentation (minimum 1 minute) that covers the introduction, demo, problem, solution, and architecture.

The technology stack for the MVP must be chosen for speed of development and seamless integration with the Base ecosystem.

Component	Technology / Tool	Rationale
<b>Smart Contracts</b>	Solidity, Foundry	Standard for EVM development; Foundry provides a fast, modern, and robust testing framework essential for rapid iteration during a hackathon.
<b>Frontend</b>	Next.js, Viem, OnchainKit	Next.js is the standard for React applications. Viem is a lightweight and efficient Ethereum interface. OnchainKit provides pre-built Base-native components (wallet



		connectors, etc.) to dramatically accelerate frontend development. <sup>20</sup>
<b>Backend</b>	Node.js, Express	A standard, flexible, and fast backend stack for implementing the API logic and the server-side component of the x402 protocol.
<b>Wallet</b>	Base Account	The primary target for user interaction. Demonstrating integration with Base's flagship smart wallet will be highly valued by judges and ensures a frictionless user experience with gasless transactions. <sup>26</sup>

## 6.2 Phase 2: Post-Hackathon Seed Stage (3-6 Months)

Following a successful showing at the Base Batches buildathon, the focus will shift to expanding the MVP into a viable product. This phase will be funded by applying for a Base Builder Grant, which offers retroactive funding of 1-5 ETH for shipped projects ready to scale.

- **Key Objectives:**

- Develop a self-serve advertiser dashboard for campaign creation and management.
- Build a publisher portal with the initial version of the monetization SDK.
- Integrate the Tier 1 AI features, specifically the generative AI for ad copy and visuals.
- Implement a basic on-chain analytics dashboard for tracking verifiable ROI.
- Onboard an initial cohort of 5-10 pilot advertisers and publishers from the Base ecosystem.

## 6.3 Phase 3: Scaling for Dominance (12-24 Months)

With a functional platform and initial market validation, the project will enter its growth phase,

aiming for significant funding and market leadership. The project will be well-positioned to apply for the next cohort of Base Batches in the more advanced "Startup Track".

- **Key Objectives:**

- Roll out the Tier 2 (Predictive Segmentation, AI Fraud Detection) and Tier 3 (ZKP-based Targeting, Federated Learning) AI capabilities.
- Introduce a protocol governance token and establish the treasury DAO to decentralize control and create a self-sustaining economic model.
- Explore cross-chain interoperability solutions to allow advertisers from other EVM chains to reach the high-value user base on Base.
- Scale the business development team to onboard major Web3 projects, wallets, and media outlets as partners.

- **Expanded Reach Through No-Code Integrations:** To accelerate adoption beyond the Web3-native developer community, Axonlayer will develop plugins and integrations for major no-code/low-code website builders.

- **Framer:** Create a custom component that allows users to drag-and-drop an Axonlayer ad slot directly onto their Framer canvas, with visual controls for customization.
- **Webflow:** Build a Webflow App that provides a Designer Extension for placing ad units visually and a Data Client to sync revenue analytics into the Webflow CMS.
- **Wix:** Develop a site plugin using Wix Blocks that users can install from the App Market to easily add ad monetization to their Wix sites.

The following table provides a clear, long-term vision that connects the product development timeline with the AI strategy and business goals, demonstrating a credible plan to achieve the project's ambitious vision.

Phase	Key Objectives	Core Platform Features	AI Capabilities	Target Metrics
<b>Phase 1: MVP</b> (4 Weeks)	Win Base Batches; Prove core x402 mechanic.	Demo dApp, simple deposit contract, basic backend.	None.	Functioning end-to-end demo; Positive feedback from judges.
<b>Phase 2: Seed</b> (3-6 Months)	Achieve product-market fit with early adopters.	Advertiser & Publisher dashboards; SDK v1.0.	<b>Tier 1:</b> Generative AI for ad creatives; Performance Prediction.	10+ active advertisers; 25+ active publishers; \$10k+ in ad spend

				processed.
<b>Phase 3: Scale</b> (12-24 Months)	Become the dominant ad protocol on Base.	Governance token & DAO; Cross-chain support; Framer, Webflow, Wix integrations.	<b>Tier 2 &amp; 3:</b> Predictive Segmentation; ZKP Targeting; Federated Learning.	\$1M+ in ad spend processed; 100+ active advertisers; Protocol governance active.

## VII. Concluding Analysis: Establishing "Axonlayer" as Critical Web3 Infrastructure

The Axonlayer protocol, as outlined in this report, represents an opportunity to build more than just another advertising network. It is a blueprint for architecting a fundamental piece of Web3 infrastructure: a protocol for the programmatic pricing and exchange of on-chain attention. The strategic decision to build natively on Base, combined with the pioneering integration of the x402 payment standard and a visionary, multi-tiered AI strategy, positions this project not to follow existing trends, but to define the future of on-chain commerce.

By moving away from the extractive surveillance model of Web2 and embracing the core Web3 principles of transparency, user sovereignty, and privacy, Axonlayer can solve critical pain points for all participants in the digital economy. For dApp developers, it provides a desperately needed, easy-to-integrate monetization solution. For advertisers, it offers access to verifiable, high-intent audiences with unparalleled ROI transparency. For users, it transforms them from a product to be sold into empowered participants who can earn from their attention without sacrificing their privacy.

The successful execution of the phased roadmap—from a focused buildathon MVP to a fully-scaled, AI-powered, and community-governed protocol—will create a powerful and defensible market leader. The platform's success will generate a virtuous cycle, where increased usage enhances the AI's intelligence, which in turn delivers better results and attracts more users, solidifying its position. Ultimately, Axonlayer has the potential to become a foundational economic layer of the Base ecosystem and the broader decentralized internet, empowering a new generation of creators, builders, and autonomous agents to exchange value in a fair, efficient, and open marketplace.

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