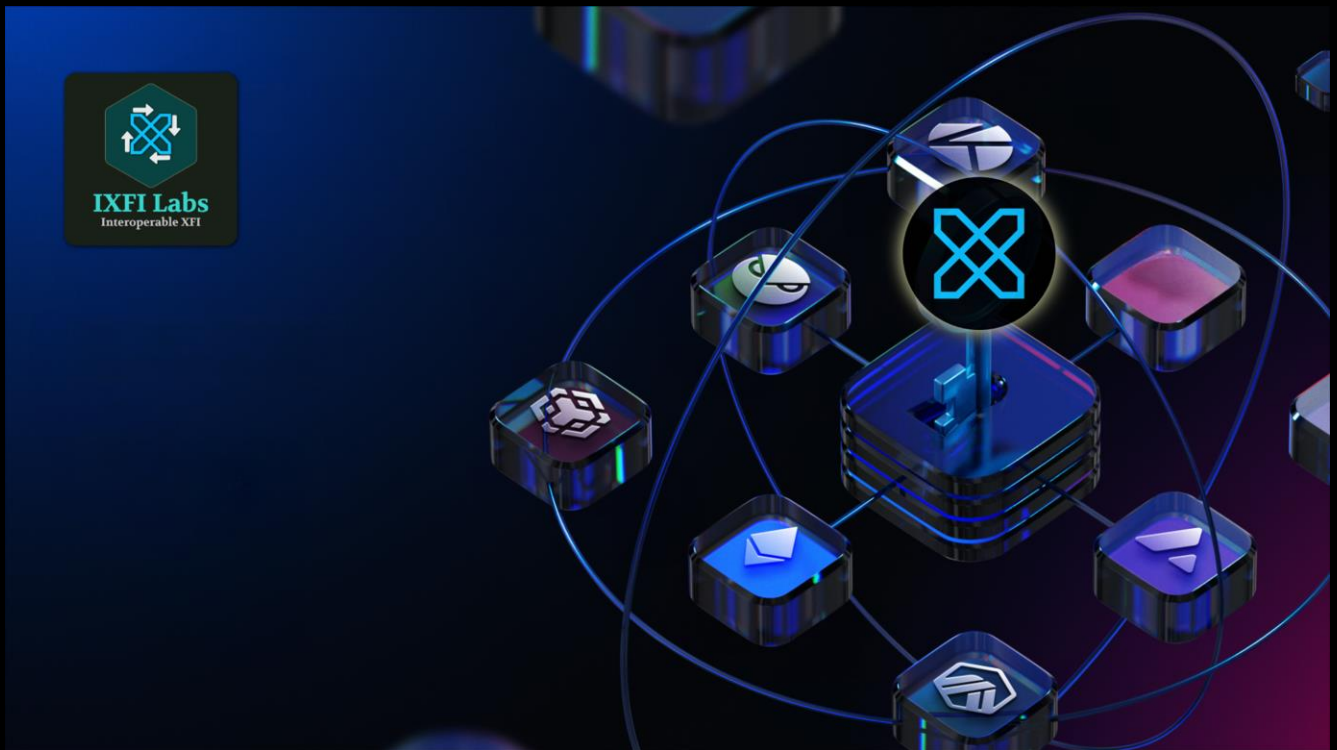


Interoperable XFI



Provide lightspeed and efficient interoperable cross-chain DApps including CrossFi chain.



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03/28/2025

Interoperable XFI Protocol

1. Overview

Product Name: Interoperable XFI

Vision: Provide lightspeed and efficient interoperable cross-chain DApps using XFI and improve daily utilization of native token.

Date: 2025.3.15

2. Problem Statement

CrossFi Chain offers several key advantages as a blockchain solution:

- **High Scalability:** The CrossFi Chain can handle up to 1 million operations per second, making it highly efficient for large-scale transactions.
- **Interoperability:** It works seamlessly with other systems, allowing for easy integration with various blockchain networks and traditional financial infrastructure.
- **Hybrid Architecture:** CrossFi Chain combines the benefits of Ethereum Virtual Machine (EVM) and Cosmos, allowing it to onboard dApps from both ecosystems.
- **Non-Custodial Transactions:** The platform enables seamless crypto-to-fiat transactions without the need for third-party intermediaries, maintaining user control over funds.
- These advantages position CrossFi Chain as a versatile and efficient blockchain solution, bridging the gap between traditional finance and decentralized systems while offering enhanced security, scalability, and user experience.

XFI is the native token of the CrossFi blockchain ecosystem, serving multiple important functions:

- **Utility:** XFI is the primary utility coin for accessing decentralized applications, products, and services within the CrossFi ecosystem²⁵.
- **Transaction Fees:** It is used to pay for transaction fees on the CrossFi Chain, ensuring smooth and efficient network operations
- **Collateralization:** XFI can be used as collateral to mint xUSD, CrossFi's stablecoin.
- **Payments:** It serves as a payment method within the CrossFi App and across both the Cosmos and EVM layers of CrossFi Chain

CrossFi Chain and its native token, XFI, offer significant advantages for real-world usage. However, the CrossFi market has struggled in recent months due to a lack of daily-life utility and the absence of live dApps to utilize token.

Enhancing CrossFi's Cross-Chain Capabilities and Ecosystem Utilization

In the dynamic landscape of blockchain technology, cross-chain interoperability has become a critical factor for the growth and adoption of decentralized applications (DApps). Bridges and cross-chain protocols are now essential in facilitating seamless asset and data transfers between different blockchain networks, breaking down the silos that previously isolated individual chains.

CrossFi, with its innovative layer 1 blockchain featuring a modular architecture that integrates Cosmos and EVM capabilities, possesses significant potential in this arena. However, its current bridge function, while boasting efficient settlement times, faces several limitations:

- **Narrow Scope:** The existing bridge primarily focuses on transferring wrapped XFI tokens between EVM-compatible chains, neglecting broader interoperability needs.

- **Limited Functionality:** The bridge lacks support for cross-chain message passing and smart contract interactions, restricting its utility in the evolving DApp ecosystem.
- **Underutilization:** Despite CrossFi's advantages in modular architecture and high throughput, the network experiences low XFI token utilization and minimal daily DApp usage.
- **Restricted Asset Support:** The bridge currently supports only XFI token transfers, limiting its appeal to users and developers seeking multi-asset functionality.

To address these challenges and position CrossFi as a key player in the cross-chain landscape, **it is crucial to maximize XFI token utilization and expand the bridge's capabilities, enhance the overall ecosystem, and implement strategies to increase XFI utilization and DApp adoption.** This expansion should leverage CrossFi's unique architectural advantages while addressing the growing demands for comprehensive cross-chain interoperability and practical applications in the blockchain space.

3. Solution Overview

Interoperable XFI (IXFI) Protocol

The **Interoperable XFI (IXFI) Protocol** introduces a groundbreaking approach to cross-chain interoperability by leveraging **XFI as the primary gas token**. This enables **gasless cross-chain swaps** through a **meta-transaction relay system** while enhancing XFI's utility across multiple blockchain networks.

By addressing the **limitations of CrossFi's existing bridge**, IXFI transforms **CrossFi's ecosystem** into a fully interoperable and programmable cross-chain infrastructure. This innovation allows seamless asset transfers, smart contract execution, and data messaging across diverse blockchain ecosystems.

Key Features of IXFI

IXFI is built upon two core components:

1. Gasless Meta-Transaction System (XFI as Primary Gas Token)

- Users pay gas fees exclusively in XFI, regardless of the blockchain they are transacting on.
- Supports Ethereum, BNB Chain, Polygon, Optimism, Base, and any EVM-compatible blockchain.
- Simplifies the user experience by abstracting gas fees and reducing friction in cross-chain swaps.

2. Enhanced XFI Interoperability (Replacing WXFI)

- Replaces the need for a wrapped XFI (WXFI) by introducing a native cross-chain XFI token.
- Enables data transmission and smart contract execution alongside asset transfers.
- Expands XFI's programmability across different chains, improving developer accessibility.

Main Components of the Protocol

Cross-Chain Swap Powered by XFI

A robust DEX Aggregator and Liquidity Router ensure the most efficient swaps using XFI for gas.

Gas Fee Abstraction

- **Off-Chain Transaction Signing** → Users sign transactions off-chain, reducing gas costs.
- **XFI Gas Conversion** → Automatically swaps XFI for native gas tokens where required.
- **Meta-Transaction Relayer** → Executes transactions on behalf of users using IXFI relayers.

Cross-Chain Swap Optimization

- **DEX Router Integration & Liquidity Aggregation** → Fetches best rates from multiple sources.
- **Slippage Optimization** → Splits orders across multiple liquidity pools to reduce slippage.
- **Routing Algorithm** → Finds optimal paths for lowest-cost and highest-return swaps.
- **Batch Transactions** → Reduces transaction fees by bundling multiple operations.

Cross-Chain Bridge & General Message Passing (XFI-Based)

Beyond token swaps, IXFI supports advanced cross-chain interactions, making it a powerful programmable interoperability layer.

Enhanced XFI Token Design

- **1:1 Interchangeability** → IXFI maintains parity with **native XFI** across all supported chains.
- **Multi-Functional Transfers** → Supports asset movement, data transmission, and smart contract execution.

Expanded Interoperability

- **Beyond EVM Chains** → Future support for **non-EVM blockchains** to expand the ecosystem.
- **Cross-Chain Smart Contract Calls** → Enables smart contracts on one chain to trigger actions on another.

Enhanced Programmability

- **Custom Cross-Chain Apps** → Developers can build **programmable cross-chain applications**.
- **Generalized Message Passing** → Arbitrary data transmission between chains for **more complex operations**.

Performance & Fee Optimization

To ensure scalability and cost efficiency, IXFI incorporates:

High-Throughput Benchmarking → Showcases CrossFi Chain's ability to handle large transaction volumes.

Dynamic Fee Structure → Optimizes gas fees to incentivize frequent transactions.

Use Cases & Ecosystem Expansion

The IXFI protocol serves as the foundation for a new generation of cross-chain DApps, including:



Cross-Chain DEX Aggregators & Swap Platforms



Cross-Chain Lending & Borrowing Protocols



Multi-Chain Liquidity Provisioning & Yield Aggregation



Cross-Chain Staking & Yield Farming



Decentralized Cross-Chain Messaging & Smart Contract Execution

Strategic Impact for CrossFi

By implementing IXFI, CrossFi will establish itself as a leader in blockchain interoperability, significantly enhancing XFI's core utility while driving adoption and network growth.

This solution lays the groundwork for truly seamless, gas-efficient, and highly programmable cross-chain transactions—a critical step toward scaling DeFi beyond siloed ecosystems.

4. Technology and Architecture

Core Architectural Components

1. Gas Abstraction Layer (ERC-2771 Trusted Forwarder)

- Utilizes **ERC-2771** standard to enable **gasless transactions**.
- Transactions are signed by users **off-chain** and relayed via the **IXFI Meta-Transaction System**.
- Relayers pay gas fees in native tokens and get reimbursed in XFI.
- Provides a seamless user experience by abstracting gas costs across chains.

2. Cross-Chain Swap & Liquidity Aggregation

- **DEX Aggregator** fetches the best swap rates across multiple **decentralized exchanges (DEXs)**.
- **Liquidity Optimization** through order splitting across liquidity pools to minimize slippage.
- **Routing Algorithm** finds optimal paths for token swaps, reducing transaction fees.
- **Batch Transactions** are executed to optimize on-chain costs.

3. Cross-Chain Bridge & Generalized Message Passing

- **Generalized Message Passing (GMP)** allows execution of smart contract calls across chains.
- **Native XFI Cross-Chain Transfers** eliminate the need for wrapped assets like WXFI.
- **Supports EVM-Compatible Chains**, expanding interoperability beyond Ethereum-based networks.
- **Relayer System** ensures secure and efficient message execution across blockchains.

4. Relayer Node System

- A **decentralized network of relayers** is responsible for executing gasless transactions.

- Relayers earn **transaction fees in XFI** for submitting user-signed transactions.
- Implements **failover mechanisms** to prevent single points of failure.
- **Stake-based security model** ensures only trusted nodes participate in transaction execution.

5. IXFI Governance & Incentive Mechanism

- **Decentralized Governance:** XFI token holders govern protocol upgrades and changes.
- **Liquidity Mining & Staking Rewards** to incentivize long-term participation.
- **Fee Discounts for LPs and XFI Holders** to promote ecosystem engagement.
- **Revenue Model:** A portion of transaction fees from swaps, relayers, and bridge services is allocated for protocol sustainability.

Supported Networks & Ecosystem

- **Ethereum, BNB Chain, Polygon, Optimism, Base, Arbitrum,** and other **EVM-compatible** chains.
- Future support for **Non-EVM** chains such as **Cosmos, Solana, Polkadot,** and more.
- Integration with **leading DeFi platforms** for enhanced cross-chain yield farming, lending, and staking.

Security & Performance Enhancements

- **MEV Resistance Mechanisms** to prevent front-running and ensure fair execution.
- **Dynamic Fee Optimization** for cost-efficient gas pricing.
- **Scalability through Layer 2 Rollups,** enabling fast and cost-effective transactions.

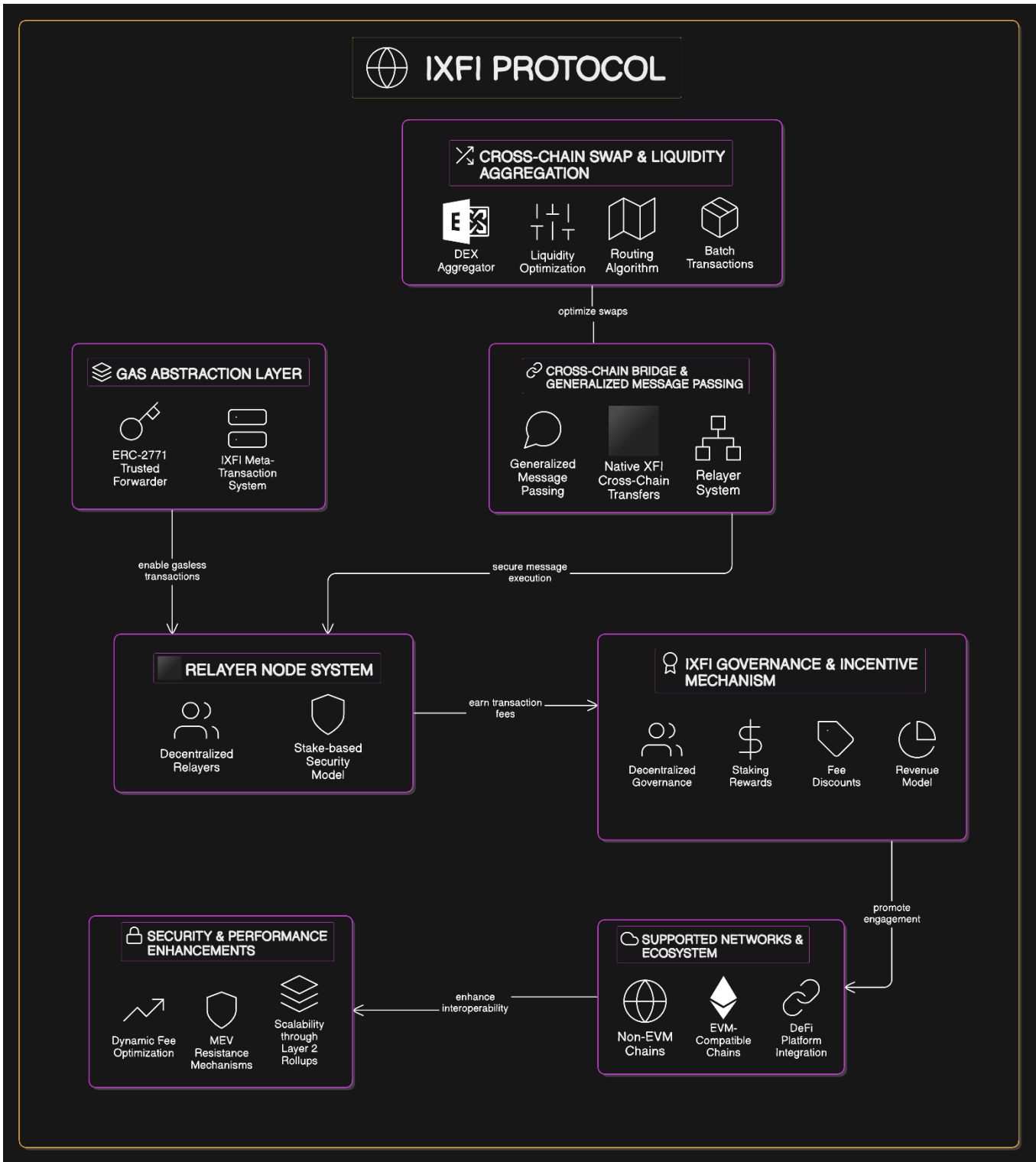


Figure. Diagram of the IXFI protocol

5. Product Demo or Use Cases

This is MVP version that only shows the possibility of Meta Transaction and Interoperability, cross-chain programmable features.

Website <https://ixfi-network.vercel.app>

Organization <https://github.com/IXFILabs/IXFILabs>

Contract (Solidity, Hardhat, Node.js)

<https://github.com/IXFILabs/IXFI-Contracts>

Meta Transaction Relayer (Node.js + Express.js + Viem)

<https://github.com/IXFILabs/IXFI-Relayer>

Frontend (Next.js + Mui + Wagmi + Viem)

<https://github.com/IXFILabs/IXFI-Frontend>

Smart Contract on CrossFi Chain Testnet

Interoperable XFI - Token Contract

Feature: 1: 1 XFI interchangeable like Wrapped XFI with programmable

Source: <https://github.com/IXFILabs/IXFI-Contracts/blob/main/contracts/IXFI.sol>

Deployed: 0x0ebf472aa078Bbfce4F154Fdef3aBe3D9fa5C5Ec

IXFI Caller

Feature: Cross Chain Programmable & Messaging using multicall

Source: <https://github.com/IXFILabs/IXFI-Contracts/blob/main/contracts/IXFICaller.sol>

Deployed: 0xdafocef4fc5447a5911b73c1b8148a6f838403d9

IXFI Gateway

Feature: Gasless Meta Transaction Gateway for relayers

Source: <https://github.com/IXFILabs/IXFI-Contracts/blob/main/contracts/IXFIGateway.sol>

Deployed: 0x24ace36d6565fc3a27e2bb9f2f0fa164d3f2adf6

Gas Relayer XFI

Feature: Charge & Swap XFI to network native coin to cover gas fee

Source: <https://github.com/IXFILabs/IXFI-Contracts/blob/main/contracts/IXFIGateway.sol>

Deployed: 0xf337fc4d623b5a2664138947aa6cea8ce783f3f2

6. Business Model

To ensure sustainability and profitability, the **Interoperable XFI (IXFI) Protocol** should have a well-structured revenue model. Below are key monetization strategies that leverage liquidity aggregation, cross-chain swaps, and gas abstraction.

1. Swap Fees (Protocol Fee)

How It Works:

Whenever a user swaps tokens via the IXFI aggregator, a **small percentage (e.g., 0.1% - 0.3%)** of the trade value is taken as a fee.

Revenue Formula:

$$\text{Revenue} = \text{Total Swap Volume} \times \text{Fee Percentage}$$

Example:

If IXFI processes **\$100 million** in swap volume per month and charges a **0.2%** fee, revenue would be: $100,000,000 \times 0.002 = 200,000$

Fee Distribution:

- **XFI Staking Pool** (50%) → Rewarded to XFI stakers.
- **Protocol Treasury** (30%) → Used for development & ecosystem growth.
- **Liquidity Providers (LPs)** (20%) → Incentivizes liquidity provisioning

2. Gasless Transaction Service (Relayer Fees)

How It Works:

- Users can **swap without paying gas fees** using the **XFI Gas Relayer Pool**.

- Instead of paying gas directly, users pay a small fee in the form of **XFI tokens** or a slightly **higher swap rate**.
- This creates a **convenient user experience** similar to how **Biconomy's gasless transactions** work.

Revenue Formula:

$$\text{Revenue} = \text{Total Gasless Swaps} \times \text{Average Gas Fee Paid} \times \text{Markup}$$

Example:

- Assume IXFI processes **1 million gasless transactions per month**.
- If the average gas fee per transaction is **\$3** and IXFI charges a **10% markup**, then: $1,000,000 \times 3 \times 1.1 = 3,300,000$
- **\$3.3 million per month** in revenue from gasless swaps.

3. Cross-Chain Swap Fees

How It Works:

- Users swapping assets across chains pay a **network fee** (like Synapse or Stargate).
- IXFI can charge a small **cross-chain execution fee** (e.g., 0.15%-0.25% per swap).
- This covers bridge fees and rewards XFI relayers.

Revenue Formula:

$$\text{Revenue} = \text{Total Cross-Chain Volume} \times \text{Fee Percentage}$$

Example:

- Assume IXFI processes **\$500 million** in cross-chain swap volume per month.

- Charging **0.2%**, revenue would be:
 $500,000,000 \times 0.002 = 1,000,000$
 $500,000,000 \times 0.002 = 1,000,000$
- **\$1 million per month** in fees.

4. XFI Token Utility & Staking

How It Works:

- Users must stake XFI to get fee discounts or VIP access to gasless swaps.
- Stakers earn a share of protocol revenue
- Validators & relayers must stake XFI as collateral to process transactions.

Revenue Model:

1. **XFI Staking Lockup Fees** → Users pay a small fee when locking/unlocking XFI.
2. **Validator Collateral** → Relayers need to **stake XFI to participate**.
3. **Fee Discounts & Premium Plans:**
 - Free Plan: Standard swap fees.
 - Pro Plan: Stake **\$10K XFI** → **25% discount** on fees.
 - VIP Plan: Stake **\$100K XFI** → **50% discount**.

Projected Revenue Model (Estimated)

Revenue Stream	Monthly Revenue Potential
Swap Fees (0.2% fee on \$1B volume)	\$2M
Relayer Fees (10% markup on \$3M gas)	\$3.3M
Cross-Chain Swap Fees (0.2% fee on \$500M volume)	\$1M
XFI Staking & Premium Plans	\$500K
Total Estimated Revenue	\$6.8M

7. Estimated Budget

Highlighted items are not included in development stage

1. Development Costs

Item	Estimated Cost (USD)
Smart Contract Development	\$20,000 - \$50,000
Cross-Chain Bridge Development	\$20,000 - \$350,00
Frontend & Backend Development	\$20,000 - \$35,000
API & SDK Development	\$20,000 - \$40,000
DevOps & Infrastructure Setup	\$10,000 - \$20,000
Mobile App (optional)	\$10,000 - \$20,000
Total (Development)	\$100,000 - \$200,000

2. Infrastructure Costs

This stage is not included in Development Stage

Item	Estimated Cost (USD)
Node Infrastructure (RPCs, Indexers)	\$10,000 - \$20,000 / year
Cloud Hosting & Database	\$5,000 - \$10,000 / year
Security Audits (Smart Contracts)	\$25,000 - \$40,000
Penetration Testing & Bug Bounty	\$20,000 - \$60,000
Total (Infrastructure)	\$60,000 - \$130,000

3. Operations & Compliance

This stage is not included in Development Stage

Item	Estimated Cost (USD)
Legal & Regulatory Compliance	\$30,000 - \$100,000
Customer Support & Maintenance	\$15,000 - \$40,000
Total (Operations & Compliance)	\$45,000 - \$140,000

4. Marketing & Business Development

This stage is not included in Development Stage

Item	Estimated Cost (USD)
Initial Marketing (Launch)	\$25,000 - \$50,000
Community Building (Airdrops, Incentives)	\$25,000 - \$50,000
Partnerships & Exchange Listings	\$50,000 - \$150,000
Total (Marketing & BD)	\$100,000 - \$200,000

8. Our Team

Our core team consists of seasoned professionals with extensive experience in both Web2 and Web3 development. With a deep understanding of blockchain infrastructure, we have successfully built and contributed to various decentralized applications, including cross-chain DEXs and DEX aggregators.

Our team members have worked on projects that facilitate seamless token swaps across multiple blockchains, leveraging protocols like Uniswap, 1inch, and ThorChain. We have also designed DEX aggregators that optimize trade execution by sourcing liquidity from multiple decentralized exchanges, ensuring users receive the best possible rates with minimal slippage. (on Kyberswap protocol)

With this expertise, IXFI is positioned to deliver a next-generation interoperability solution that enhances cross-chain asset transfers while maintaining security, efficiency, and decentralization.



Wayne Poon,
Co-Founder, Owner
Protocol Architect



Cha Sui Soon
Co-Founder
Backend + Dev Ops



Ilyasa Sazali
Co-Founder
Frontend + Web3

For future development, after successfully raising funds (development grants or VCs), we plan to expand the organization and recruit some team members.

- Market researcher & Marketing Expert: 2
- Smart Contract Development: 2 (hire 1 more member)
- Front End Development: 3 (hire 2 members)
- Back End Developer: 3 (hire 2 members)