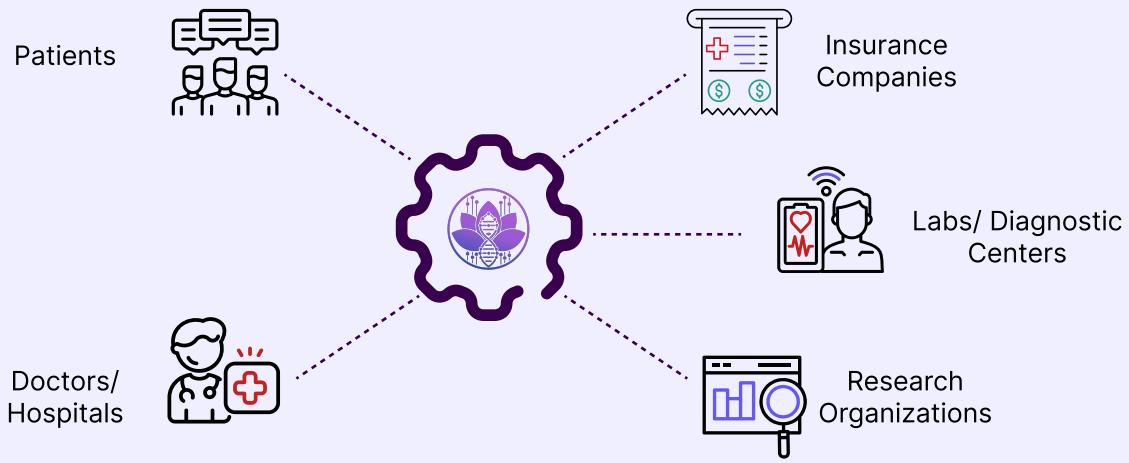
PranaChain

Your Health, Your Control

Executive Summary

Pranachain is an industry-specific platform designed for the healthcare and life sciences sector, integrating the entire healthcare ecosystem through a hybrid blockchain architecture. The platform is structured into modular components, allowing stakeholders across the industry to participate partially or fully in the value chain. These stakeholders may include hospitals, clinics, laboratories, pharmaceutical companies, insurers, research institutions, and individual patients.



Pranachain leverages a hybrid blockchain model, combining the transparency and immutability of public blockchains with the privacy and scalability of private blockchains. It supports oracles to enable seamless integration with external service providers such as insurance companies, diagnostic centers, and regulatory agencies. These oracles serve as trusted data sources, ensuring interoperability between on-chain and off-chain services. Additionally, the platform supports traceability across the entire healthcare data life cycle, ensuring compliance with global data privacy regulations such as HIPAA and GDPR.

This white paper outlines the platform's innovative architecture, key features, market opportunity, and roadmap, showcasing its value proposition for investors and healthcare partners

Introduction

Pranachain is a blockchain-powered platform designed to integrate the entire healthcare ecosystem. The platform is divided into modular components, allowing different stakeholders to participate based on their specific needs and capabilities. These stakeholders include hospitals, clinics, laboratories, pharmaceutical companies, insurers, research institutions, and individual patients.

With over 8 billion people worldwide relying on healthcare services, the industry generates trillions of dollars in medical records, insurance claims, and research data every year. However, a large portion of this data remains siloed, inaccessible, and vulnerable to breaches, leading to inefficiencies, security risks, and lack of patient control over their own medical information.

This untapped potential is being harnessed by building efficient and interoperable healthcare solutions on Pranachain. The platform enables multiple organizations to participate, whether by adopting end-to-end electronic health record (EHR) systems, developing specialized medical data-sharing solutions, or integrating decentralized identity and access management.

Pranachain provides scalability and flexibility to businesses, allowing them to operate under a unified, secure, and compliant infrastructure. By enabling seamless data exchange while maintaining privacy, security, and regulatory compliance, Pranachain is transforming the global healthcare industry.

The Healthcare Data Crisis

Despite the digitization of healthcare, Electronic Health Records (EHRs) remain fragmented, insecure, and out of the patient's control. Centralized storage leads to data breaches, inefficiencies in care coordination, and minimal patient engagement. With increasing global attention on data ownership and privacy, there's an urgent need for a secure, decentralized, and interoperable solution that bridges this gap.

The Problem

Data Silos: Health records are scattered across disconnected systems.

Security Vulnerabilities: Centralized databases are targets for breaches.

Limited Monetization & Research Use : Valuable anonymized health data remains inaccessible for innovation.

Lack of Consent Mechanisms: Patients can't manage access to their own data.

Financial Losses

$6.2B

lost annually due to poor record-keeping & inefficiencies.

Cybersecurity Risks

$10.1B

in financial losses due to cyberattacks in 2023,including fines and damage from data breaches

Provider dissatisfaction

50%

of healthcare providers report dissatisfaction with their current data management systems

Interoperability

60%

of hospitals globally still face challenges as existing systems can't share patient data effectively

Fragmented Systems

60%

of healthcare providers still rely on paper-based records

Patient Frustration

50%

of healthcare providers report dissatisfaction with their current data management systems

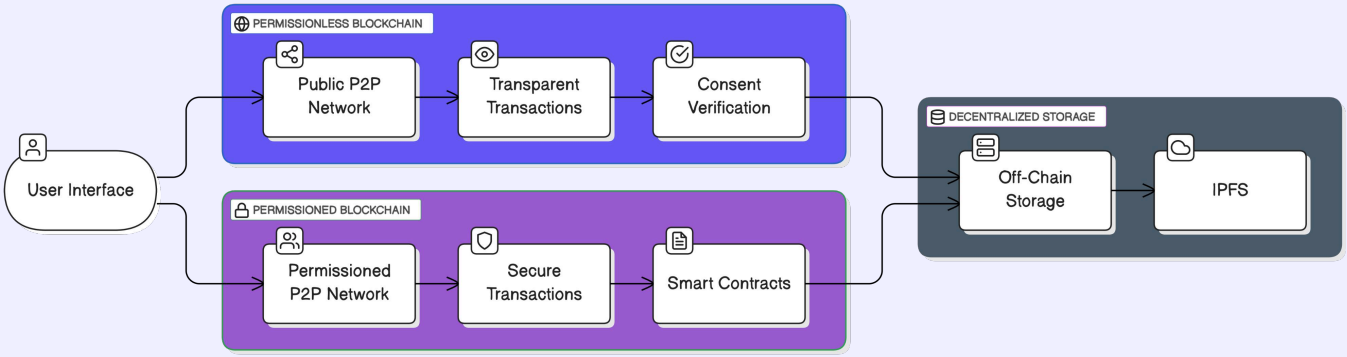
Pranachain Architecture

Pranachain is a hybrid blockchain platform designed to facilitate secure, decentralized, and interoperable healthcare data management. It integrates on-chain smart contracts with off-chain encrypted storage, ensuring efficiency, scalability, and compliance with regulatory frameworks.

The Pranachain ecosystem consists of the following core components:

- **Users & Stakeholders:** Patients, healthcare providers, laboratories, insurers, research organizations, and regulatory bodies.
- **Hybrid Blockchain Network**: Combines public and private blockchain layers for optimized security, transparency, and control.
- **Smart Contracts:** Automate data access, consent management, and transaction verification while ensuring compliance.
- **Decentralized Storage:** Utilizes IPFS, Hyperledger Fabric, and encrypted cloud storage for secure and scalable medical data storage.
- **Oracles & API Integration:** Enable real-time interoperability with external service providers such as diagnostic centers, insurance companies, and government agencies.
- **Encryption & Identity Management:** Ensures data privacy, access control, and user authentication via advanced cryptographic techniques.

System Overview



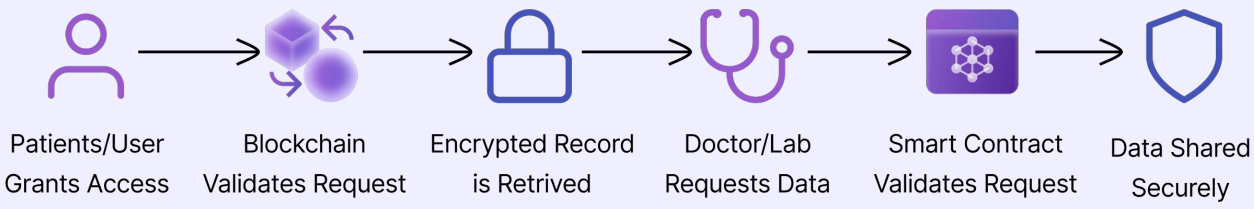
Hyperledger Fabric: Used for managing secure, enterprise-level transactions with regulatory compliance and data privacy. The permissioned network ensures that only authorized participants (e.g., healthcare providers, insurers, etc.) can interact with sensitive data, maintaining a controlled ecosystem.

Public P2P Network: Operates on a decentralized P2P network, offering open access and global transparency. This layer can handle public transactions, such as patient consent verification or other public-facing interactions, while ensuring decentralization and traceability.

Smart Contracts: The system uses smart contracts (or chaincode, depending on the blockchain layer) to manage access control, enforce patient consent, and automate transactions. These smart contracts will work across both layers to ensure seamless interaction and privacy.

Zero-Knowledge Proofs (ZKPs): Enhance privacy by enabling the validation of data access requests without revealing sensitive information. ZKPs allow data validation and consent verification while maintaining confidentiality.

Pranachain EHR Access Process



- **Grants Access:** Users grants access to their health records via the user interface.
- **Blockchain Validates Request:** The blockchain validates the request according to the patient's consent and the access permissions set by the smart contract.
- **Encrypted Record Retrieval:** The requested data is retrieved from decentralized storage, remaining encrypted throughout the process.
- **Smart Contract Validates:** Smart contracts ensure that the request complies with the access rules defined by the patient.
- **Secure Data Sharing:** The data is shared securely with the requesting party, following regulatory standards for privacy and security.

Use Cases

Patient Health Portability:

Patients can securely carry and share their complete medical history across different healthcare providers, even across geographies. This eliminates repetitive diagnostics and improves continuity of care.

Instant Lab Reporting:

Diagnostic centers and pathology labs can upload test results to the blockchain, making them instantly accessible to patients and authorized doctors. This drastically reduces wait times and enhances accuracy in diagnostics.

Insurance Claims:

Insurance providers can get time-stamped, verifiable access to relevant medical records through smart contracts, expediting claim processing and reducing fraud. This builds trust and transparency between stakeholders.

Pharma Research & Clinical Trails:

Pharmaceutical companies and researchers can access anonymized and consented patient data for drug discovery and epidemiological studies. This accelerates R&D timelines while ensuring patient privacy.

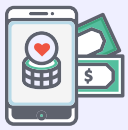
Emergency Medical Access:

In emergencies, authorized responders can gain temporary access to critical patient data - such as allergies, blood type, or chronic conditions—based on predefined consent settings, saving precious time.

Chronic Disease Management:

Patients with conditions like diabetes, hypertension, or heart disease can use the platform to track health metrics, share real-time updates with physicians, and receive timely interventions.

Health Data Monetization for Users:



Users can opt-in to monetize their anonymized data for research purposes, earning PranaTokens in exchange. This fosters a data-sharing economy where individuals benefit directly from their health data.

Global Health Access for Migrants & Travellers:

International travellers or migrants can carry their digital health history seamlessly and present it at any healthcare facility worldwide, overcoming data fragmentation.

PranaToken

Overview

PranaToken (PRN) is the native utility token of the Pranachain ecosystem, designed to drive secure, consent-based interactions across a decentralized healthcare infrastructure. PRN empowers individuals to control their health data, supports real-world integrations with medical providers, and fuels engagement across the Pranachain network.

PranaToken Utility

Fee Payments: PRN is used to pay service fees across the ecosystem for accessing medical records, lab reports, analytics tools, and insurance processing. Users pay with PRN to unlock faster, trusted, and privacy-preserving services.

Staking: PRN holders can stake their tokens to support the ecosystem's infrastructure and data network integrity. Stakers earn yield from protocol operations and gain access to premium features, early dApp releases, and more.

Rewards: As a valued member of the Pranachain ecosystem, you can earn PranaTokens (PRN) through real, meaningful contributions. Whether you're referring new users, participating in research by securely sharing your health data with consent, reporting bugs, or helping grow the community, your activity is rewarded

Governance: Token holders participate in on-chain governance, proposing and voting on key upgrades, integrations, data access policies, and development funding — ensuring the platform evolves with the voice of its users.

Tokenomics