May | 2025

ZDKL COIN

Whitepaper

Introduction

The ZDKL Coin, also known as the ZDKL-PTT coin, is a pioneering utility coin designed to operate exclusively as the utility gas fee of the (layer 1) Peace Through Trade (PTT) proof-of-work (PoW) blockchain ecosystem.

Overview - Table of Contents

Acknowledgement

White paper created by D-POW and peer-reviewed and updated by Dr. Jenny Li.

ZDKL-PTT: One of the world's First AI-Orchestrated Blockchain in Development to create Peace Through Trade

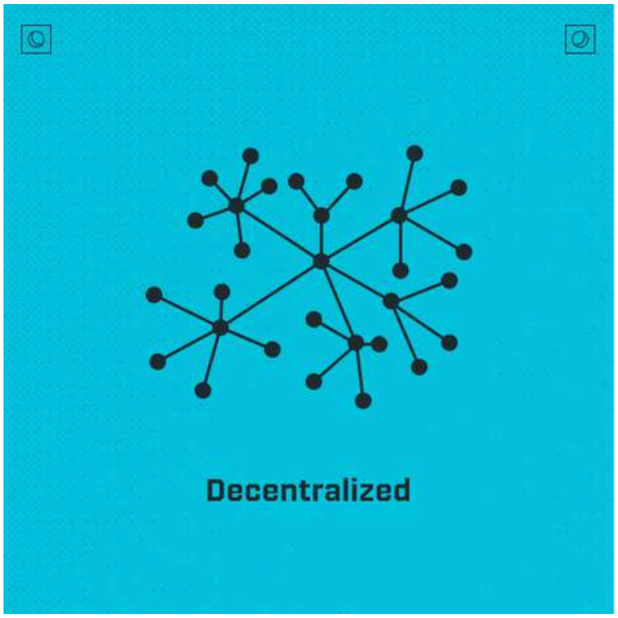
1- Introduction: ZDKL-PTT – The Exclusive Single Utility Coin of the PTT (Peace Through Trade) PoW Blockchain

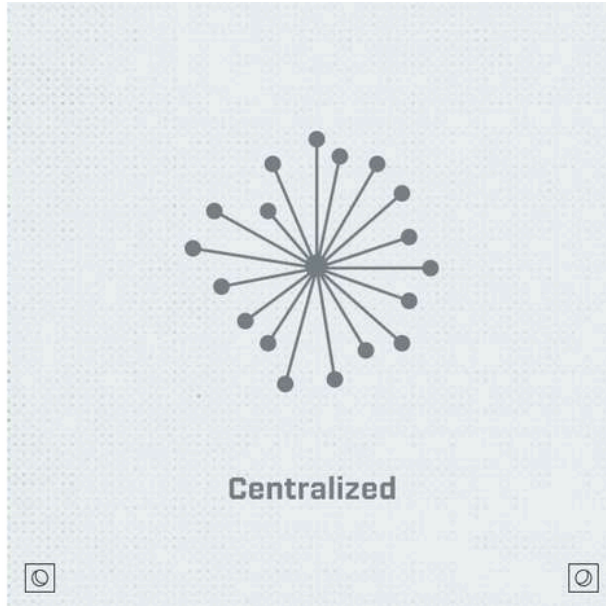
ZDKL-PTT is being built as one of the world's first fully AI-integrated blockchains, where artificial intelligence is embedded directly into the core infrastructure. AI systems under development will manage real-time load balancing, adaptive scalability, and automated self-updates, creating a resilient, self-healing network.

Security and compliance are enhanced through AI-driven threat detection and automated KYC/AML, while behavioral AI will personalize the user experience across wallets and dApps.

ZDKL-PTT is more than a blockchain — it's a self-optimizing digital ecosystem designed to evolve, secure, and scale on its own.

The ZDKL Coin, also known as the ZDKL-PTT coin, is a utility Coin designed exclusively to serve as the utility gas fee within the PTT (Peace Through Trade) Proof-of-Work (PoW) decentralized blockchain ecosystem. As the sole utility coin for the PTT blockchain, ZDKL-PTT is engineered for simplicity, functionality, and energy efficiency, while mirroring Bitcoin's (BTC) single-coin approach within its decentralized framework.





2- ZDKL: Designed as a Functional Utility Coin, Not as a Security Investment, Pairing of ZDKL and Listing on Decentralized exchanges.

ZDKL-PTT: Similarities with Bitcoin (BTC) in Functionality and Classification

It is important to clarify that the ZDKL-PTT coin is neither classified as nor designed to be a security, akin to Bitcoin (BTC). According to the Howey Test, which determines whether an asset qualifies as a security, ZDKL-PTT is strictly a functional utility Coin and does not meet the criteria for being a security. The Coin is not marketed or sold in a manner that suggests potential profit or investment returns from the efforts of others; it is not intended for investment purposes. Instead, ZDKL-PTT is designed to provide practical utility within the PTT PoW blockchain system. It operates in a decentralized manner, and its value is determined by the public market based on its utility rather than being influenced by any individual group.

The ZDKL-PTT coin shares significant similarities with Bitcoin (BTC) in both functionality and its classification as a utility Coin rather than a security

.

A. Functional Utility:

Like Bitcoin, ZDKL-PTT is designed to serve as a utility Coin within its respective blockchain ecosystem. ZDKL-PTT functions primarily as a medium for transaction fees and operational expenses on the PTT PoW blockchain, with its value derived strictly from practical usage within the ecosystem, not from speculative investment on the PTT PoW blockchain, paralleling Bitcoin's role as a digital coin for peer-to-peer transactions. This functional orientation emphasizes practical usage over speculative investment, reinforcing ZDKL-PTT's position as a utility rather than an asset intended for profit.

B. Decentralized Nature:

Both ZDKL-PTT and Bitcoin operate on decentralized networks, eliminating reliance on a central authority. This decentralized architecture ensures that both Coins derive their value from their practical utility and demand within their respective ecosystems, rather than from speculative or external influences. As a result, ZDKL-PTT mimics Bitcoin's approach to decentralization, allowing users to engage with the network freely and securely.

C. Transaction Fees and Operational Use:

ZDKL-PTT, much like Bitcoin, is utilized as a means of facilitating transactions within its network. It is not marketed or designed as a speculative asset; instead, it serves as the primary transaction fee Coin for all operations on the PTT blockchain, allowing users to transfer assets and engage with smart contracts.

D. No Expectation of Profit:

In accordance with the Howey Test, ZDKL-PTT does not offer any promise of profit to its holders. Coin holders acquire ZDKL-PTT solely for its utility within the PTT blockchain ecosystem, with no expectation of financial returns from the efforts of others. Similar to Bitcoin, the value of ZDKL-PTT is intrinsically linked to its utility within the PTT blockchain ecosystem. Coin holders do not acquire ZDKL-PTT with the expectation of financial returns generated from the efforts of others, solidifying its status as a functional utility Coin. Like BTC, ZDKL-PTT value is from the market demand of its functional Utility.

E. Designed for User Data Sovereignty:

ZDKL is built on a decentralized, privacy-first architecture that puts user data sovereignty at its core.The system follows a strict "minimum data" principle — it does not collect or store sensitive user information, and all actions require explicit user consent.

A globally distributed network of physical nodes ensures high availability, low latency, and strong resistance to censorship. By supporting localized processing and encryption, ZDKL also enables regional compliance while protecting user privacy.

This architecture empowers users with full control over their data, enabling a secure, autonomous digital experience — realizing the vision of Your Data, Your Power.

F. Enhanced Efficiency:

One of the key differences between ZDKL-PTT and Bitcoin lies in the design focus on energy efficiency and transaction speed. ZDKL-PTT has been optimized for less energy use and faster transaction processing while still being a PoW system. This improvement not only reduces the environmental impact but also enhances user experience by enabling quicker and more efficient transactions.

Through these shared characteristics and notable differences, ZDKL-PTT aligns closely with Bitcoin in its operational framework and classification while also advancing improvements that position it favorably in the evolving blockchain landscape. Another notable similar PoW blockchain is Doge coin.

i. Sustainable Energy Use: ZDKL-PTT Blockchain vs Bitcoin

Introduction

This summary compares the energy consumption of the ZDKL-PTT blockchain with the Bitcoin network, highlighting ZDKL-PTT's sustainable approach to Proof-of-Work mining using decentralized community participation.
Bitcoin uses approximately 1,600x more energy than ZDKL-PTT blockchain with 100,000 active miners and 40 enterprise servers (for initial core infrastructure).
If ZDKL-PTT scales to 1 million or more highly optimized miners, the energy efficiency advantage could reach approximately 10,000x difference compared to Bitcoin.

Power Consumption Comparison

The table below summarizes estimated annual power usage for both blockchains:

Blockchain	Power Consumption (estimate)	Mining Type	Notes
Bitcoin	~130–150 Terawatt-hours (TWh) per year (2024 est.)	Proof of Work (SHA-256, ASIC miners)	Massive industrial mining farms; extremely high energy usage.
ZDKL-PTT Blockchain	87,722.64 Megawatt-hours (MWh) per year (~87.7 GWh)	Proof of Work (Scrypt-based, CPU/GPU mining)	Lightweight, decentralized mining using personal PCs and enterprise servers.

Key Points

Bitcoin:

- Consumes the energy equivalent of a medium-sized country (e.g., Argentina).
- Mining is dominated by specialized ASIC hardware.
- Industrial-scale farms concentrate mining geographically.

ZDKL-PTT:

- Designed for efficient mining by ordinary PCs (CPUs/GPUs) and enterprise servers.
- No need for ASICs; true community mining model.
- Extremely low total energy use, even at large scale.

Approximate Energy Consumption Breakdown

Breakdown of annual energy consumption for ZDKL-PTT infrastructure:

Item	Annual Consumption (MWh)
40 Enterprise Servers	122.64 MWh

100,000 ZDKL-PTT PC Miners	87,600 MWh
Total	87,722.64 MWh

Key Points
Bitcoin:

- Ultra-secure but extremely energy-intensive (industrial-scale mining).

ZDKL-PTT:

- Secure, truly decentralized, ultra-low energy Proof-of-Work — powered by community participation.
- Designed for sustainable, global adoption without sacrificing energy efficiency.

ii. Pairing

Listing ZDKL Utility Coin on Decentralized Public Markets and Pairing to Other Tokens.

iii. Broader Accessibility

Enhanced Usability: Pairing the ZDKL Utility Coin with widely recognized stablecoins (e.g., USD) and other utility coins increases its accessibility for transactions and services globally. This setup drives practical adoption, particularly in areas where stablecoins are integral for transaction stability and innovation.

iv. Market Diversification

Utility-Driven Options: Listing ZDKL Utility Coin alongside stablecoins and other assets in decentralized markets provides users with diverse trading options. This diversification enhances the coin's role as a practical tool within the PTT PoW ecosystem, catering to various transactional and utility needs.

v. Cross-Chain Opportunities

Functional Integration: Pairing ZDKL Utility Coin with tokens on different blockchains enables cross-chain trading and enhances interoperability. This facilitates new functional use cases and integrations, broadening the coin's utility and connecting the ZDKL Utility Coin and PTT PoW Blockchain with the broader crypto ecosystem.

G. Advantages of Listing ZDKL Utility Coin on Decentralized Public Markets and Pairing to Other Tokens

i. Increased Liquidity

Enhanced Accessibility: Listing the ZDKL Utility Coin on decentralized public markets and pairing it with stablecoins and other tokens improves liquidity. This ease of buying, selling, and trading ZDKL facilitates smoother adoption and interaction within the PTT PoW Blockchain ecosystem, making the coin more practical for everyday transactions and services.

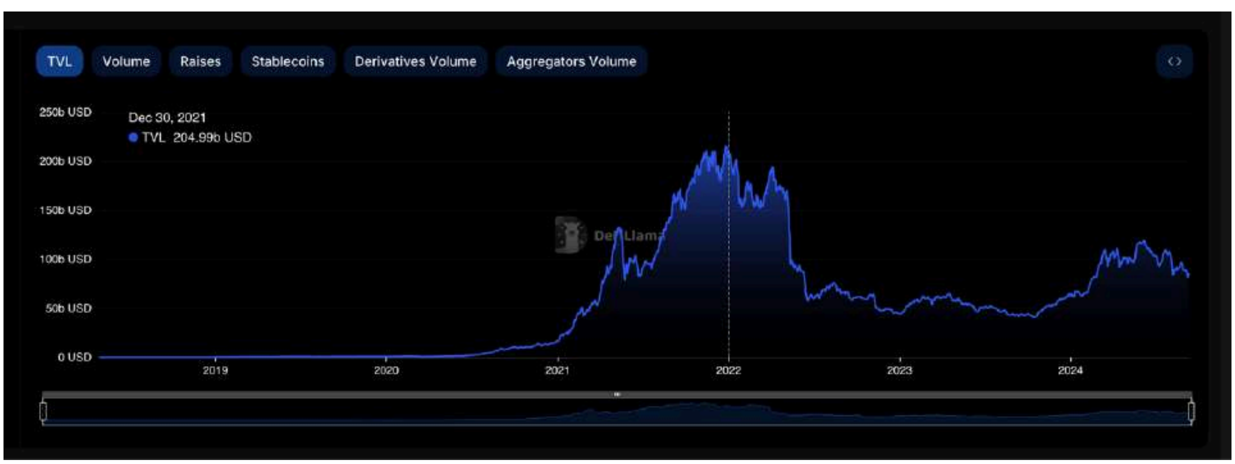
ii. Social Impact Potential

Ethical Engagement: Pairing ZDKL with tokens and projects focused on social impact (e.g., renewable energy or charitable initiatives) aligns the coin with positive social outcomes. This alignment can attract users motivated by ethical considerations, thereby increasing community engagement and support for the PTT PoW Blockchain.

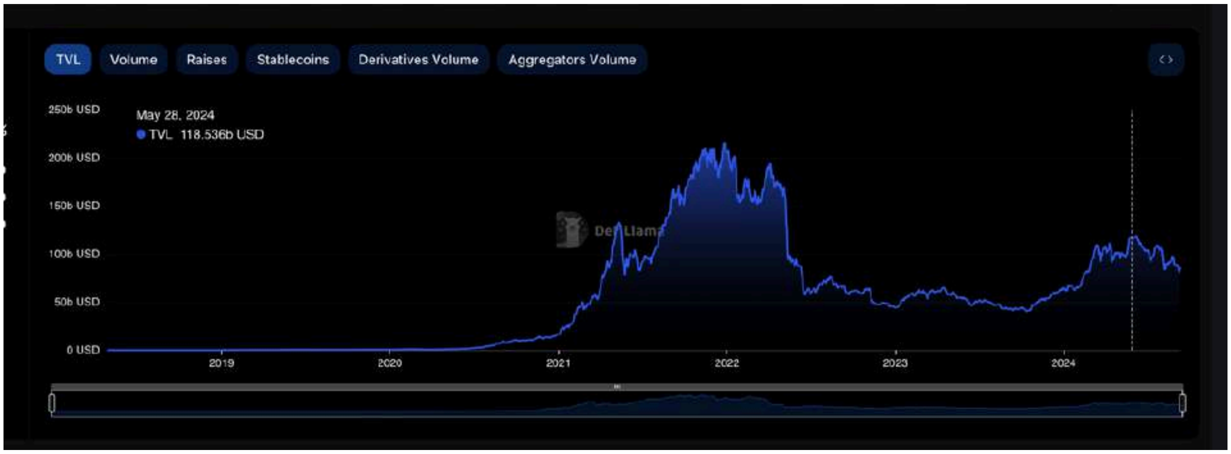
iii. Increased Adoption and Use Cases

Utility Expansion: The availability of ZDKL Utility Coin on public markets and its pairing with various tokens fosters the development of new use cases. As developers and businesses recognize the coin's practical applications in diverse contexts, its utility and adoption can be used to improve the tokenized ecosystem.

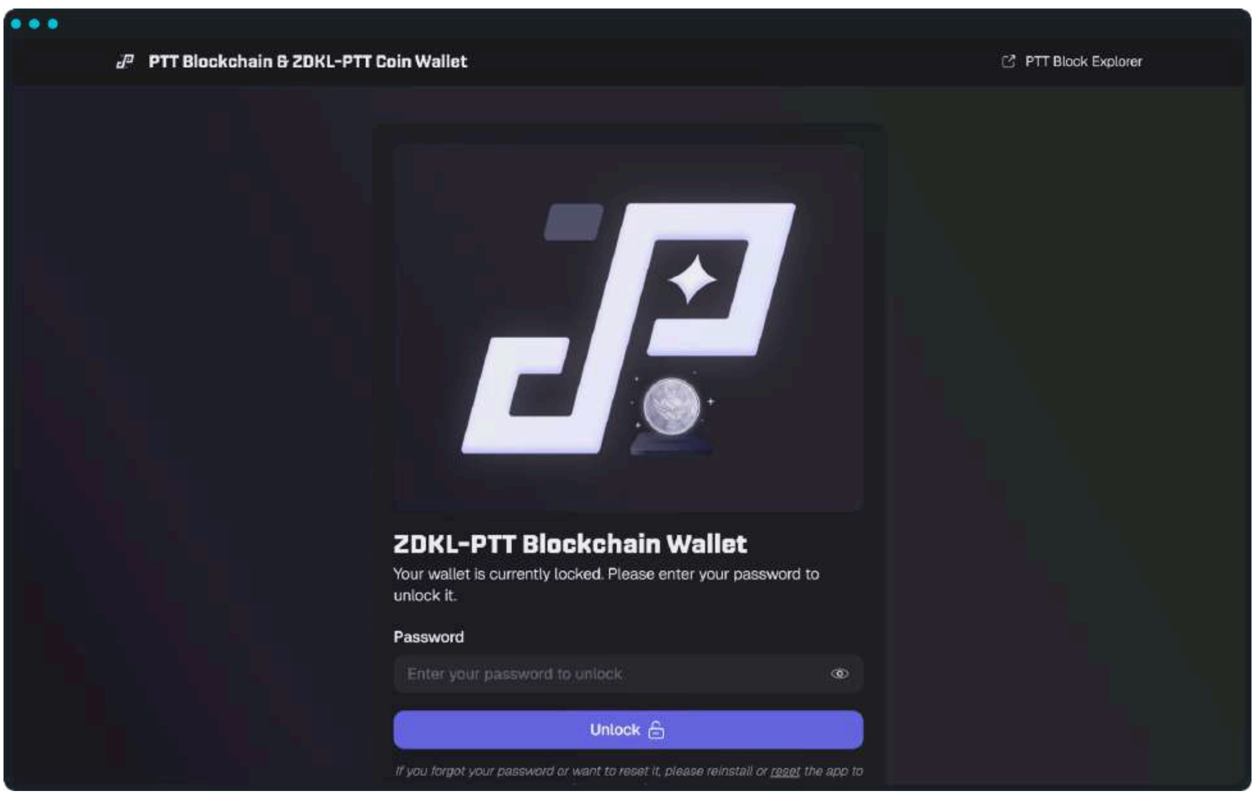
DeFi market in 2022 is approx. 204.99 billion USD



DeFi market in 2024 is approx. 118.53 billion USD



3- ZDKL-PTT Coin, Wallets and PTT Blockchain:



Designed for Simplicity, Store of Value, and Functional Utility

A. Simplicity:

The ZDKL-PTT coin operates on a single-coin structure within the PTT Proof of Work (PoW) blockchain, similar to Bitcoin. This design streamlines operations and upholds decentralization, ensuring that ZDKL-PTT functions as both a store of value and a practical tool within its ecosystem. The coin facilitates various services, including enhanced interactions within social networks, B2B marketplace transactions, and other blockchain-enabled functionalities.

B. Functional Utility of ZDKL-PTT, ZDKL- PTT Wallet and PPT Blockchain:

The ZDKL-PTT Wallet which stores the users ZDKL-PTT Coin plays a crucial role in the ecosystem, offering a comprehensive solution for managing digital assets. Available on PC, Mac, and mobile platforms, the wallet is designed for ease of use while maintaining robust functionality. Key features include:

i. Balance Tracking:

Users can view real-time updates of their coin holdings, allowing them to stay informed about their financial position within the PTT blockchain ecosystem.

ii. Send and Receive:

The wallet facilitates smooth peer-to-peer transactions, enabling users to send and receive ZDKL-PTT coins with minimal friction. This supports both personal and business uses, with transactions processed quickly and securely.

iii. Wallet Address Generation:

Each user is provided with a unique wallet address, allowing them to conduct transactions safely. The wallet generates these addresses with enhanced security measures to protect against unauthorized access.

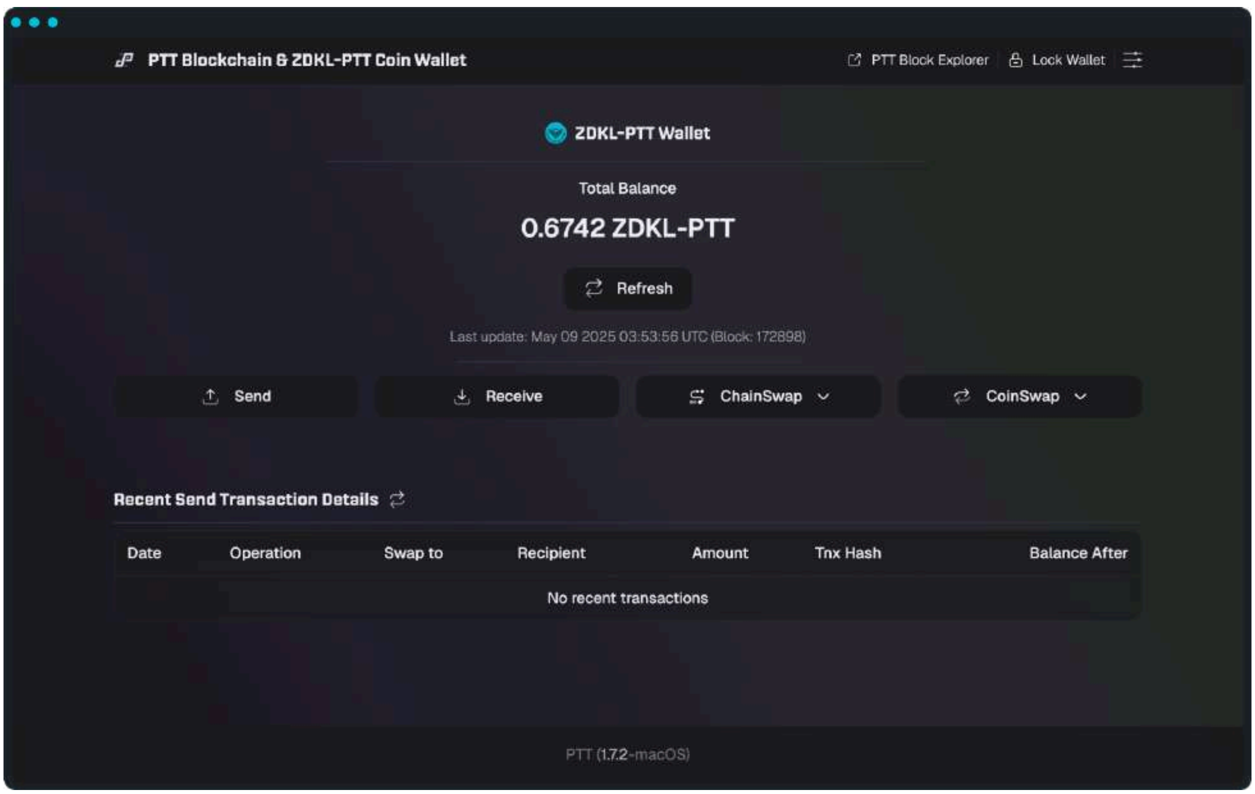
iv. QR Code Scanning:

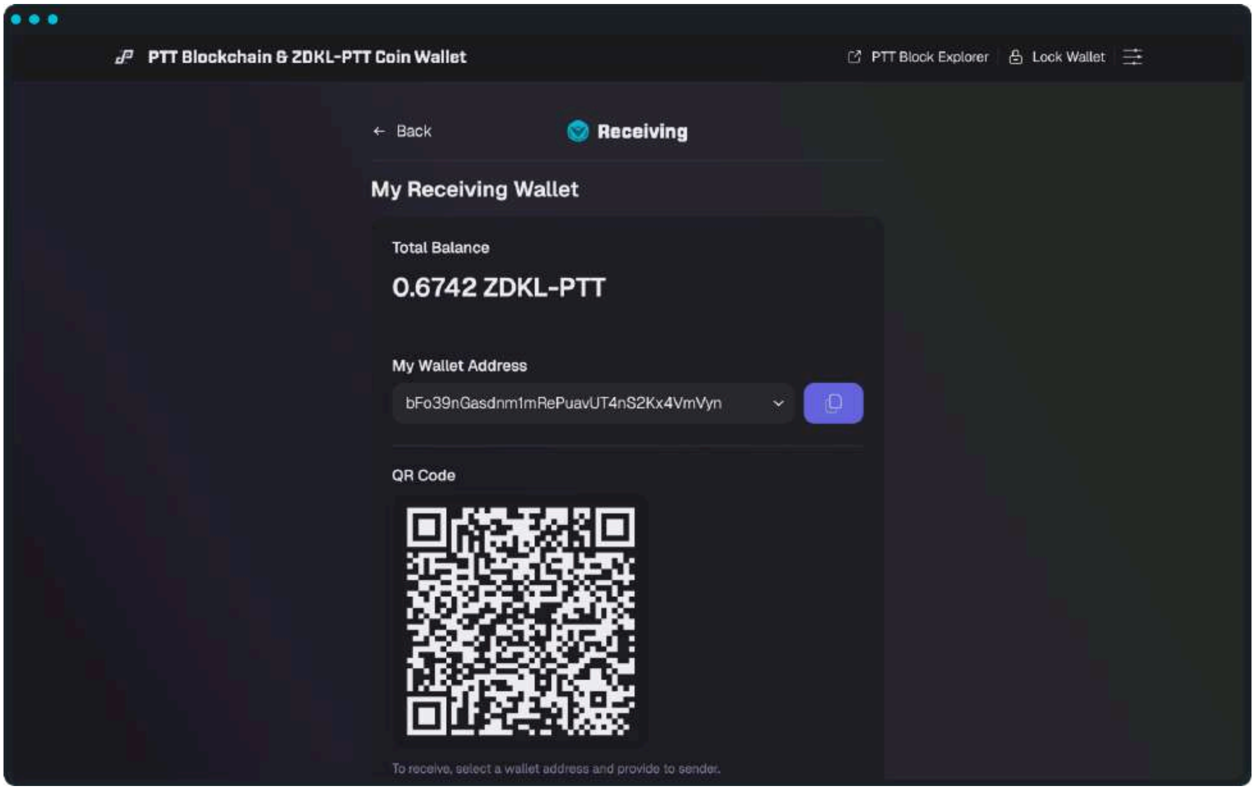
For added convenience, the wallet supports QR code functionality, enabling users to scan and send payments effortlessly. This feature simplifies the payment process, especially in retail environments or peer-to-peer exchanges.

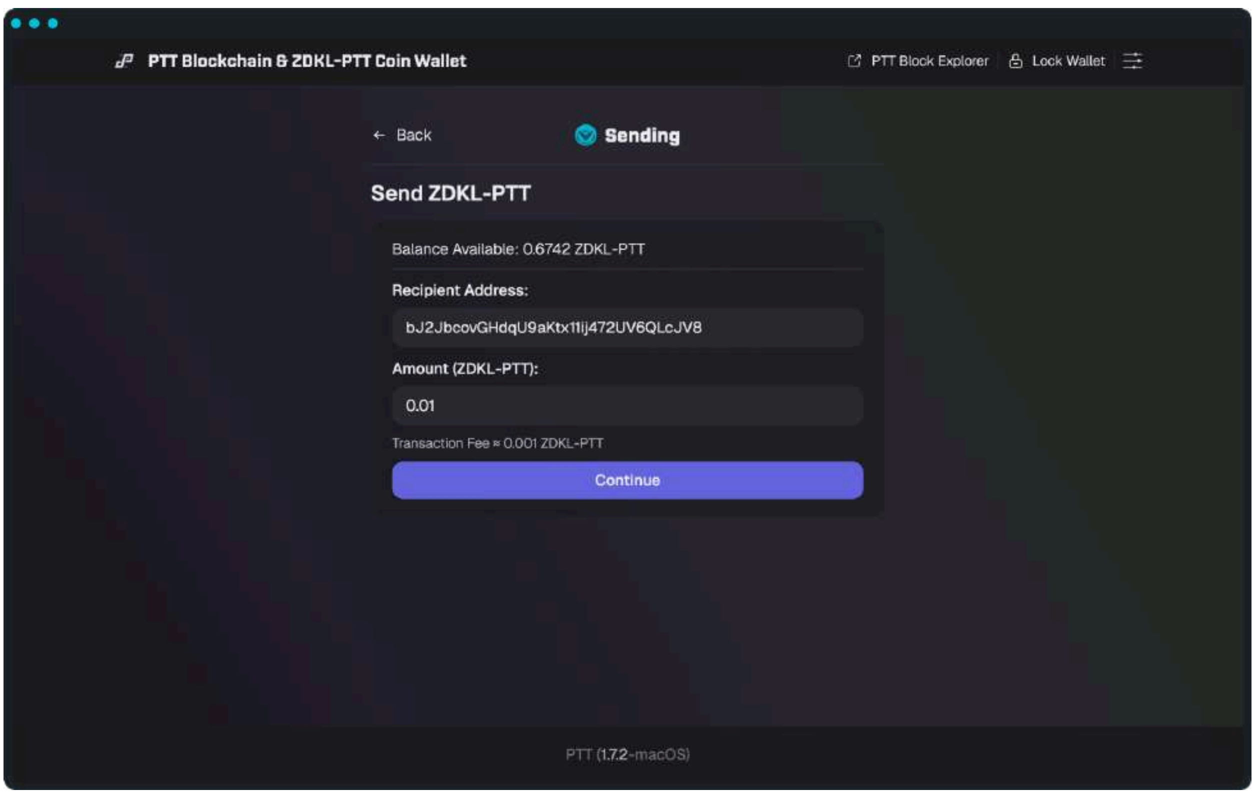
v. Transaction History:

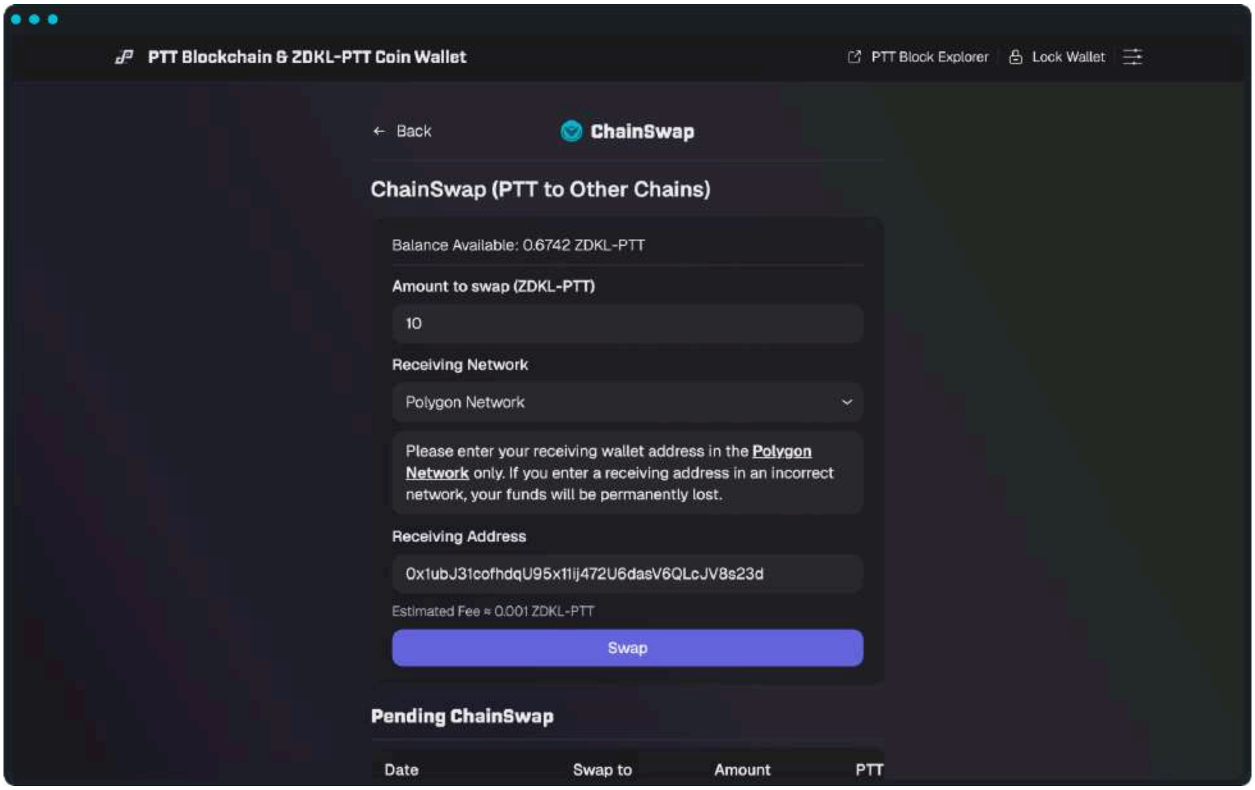
The wallet offers detailed transaction logs, enabling users to track their past transactions, monitor confirmations, and have full transparency over their financial activities. This feature is especially useful for businesses and users needing detailed records for reporting or analysis purposes.

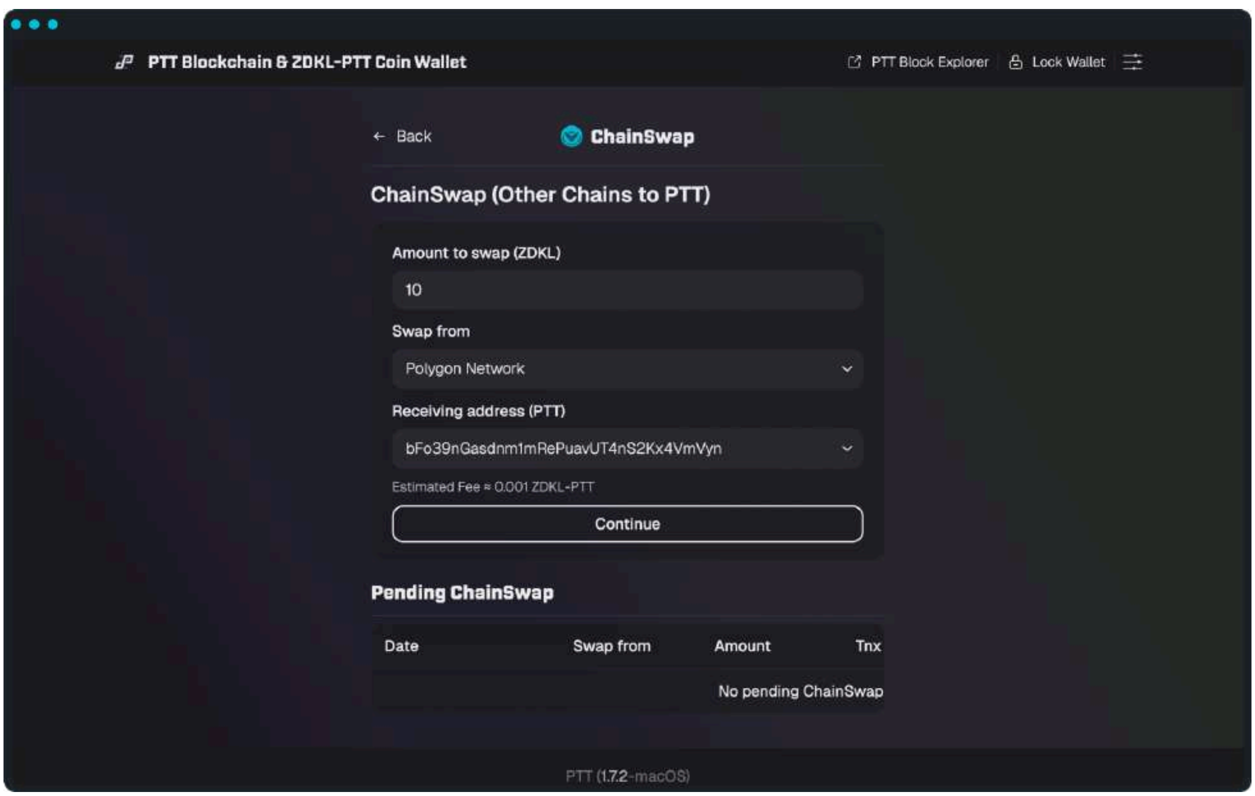
By combining these features, the ZDKL-PTT Wallet ensures users have a comprehensive tool for managing their digital assets efficiently, all while integrating seamlessly with the broader PTT blockchain.

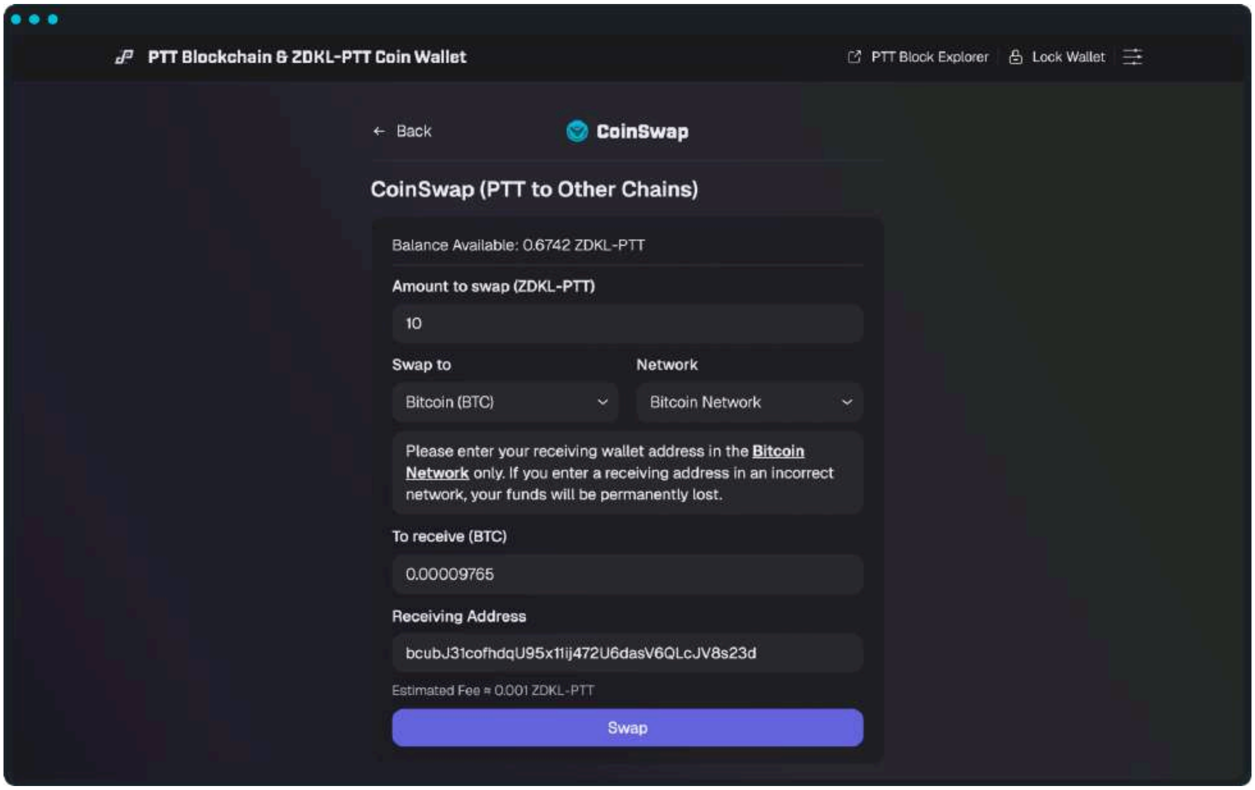


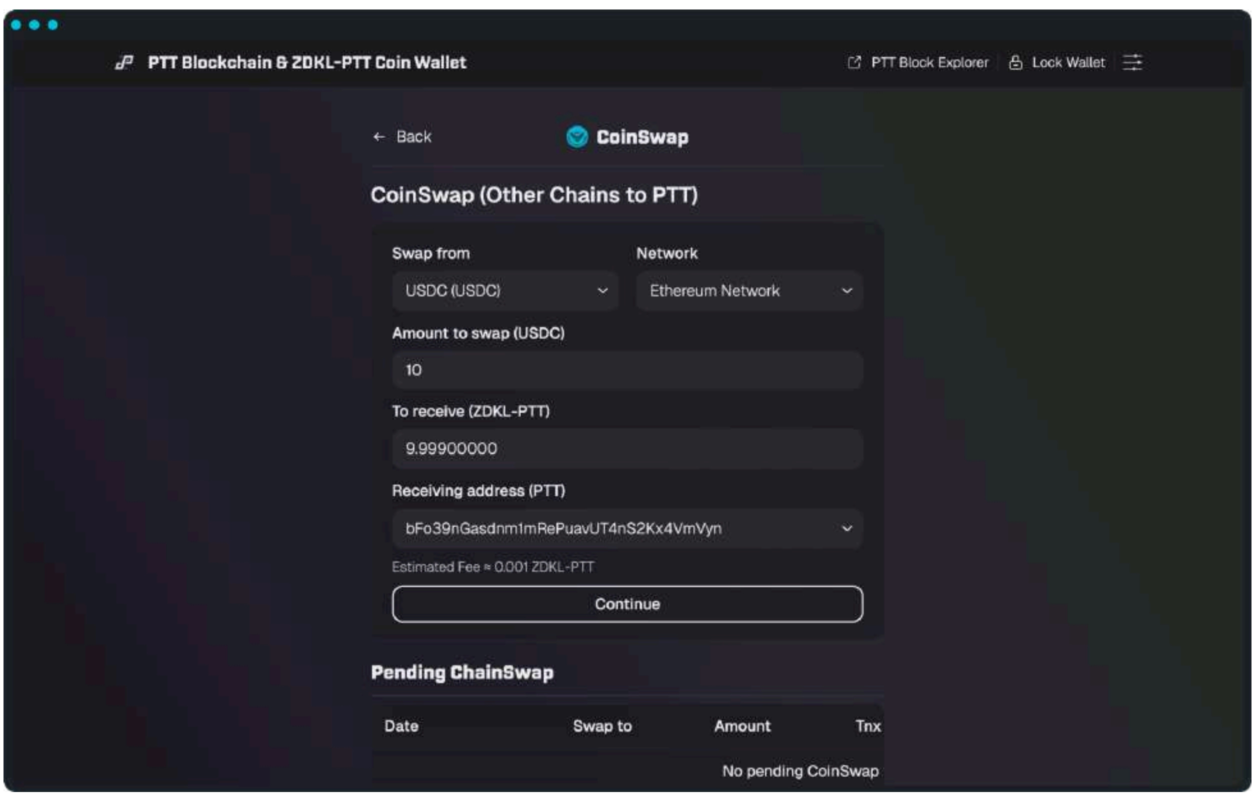

PTT Blockchain & ZDKL-PTT Coin Wallet
PTT Block Explorer
Lock Wallet
Back
Receiving
My Receiving Wallet
Total Balance
0.6742 ZDKL-PTT
My Wallet Address
bFo39nGasdnm1mRePuavUT4nS2Kx4VmVyn
QR Code
To receive, select a wallet address and provide to sender.


PTT Blockchain & ZDKL-PTT Coin Wallet
PTT Block Explorer
Lock Wallet
Back
Sending
Send ZDKL-PTT
Balance Available: 0.6742 ZDKL-PTT
Recipient Address:
bJ2JbcovGHdqU9aKtx11ij472UV6QLcJV8
Amount (ZDKL-PTT):
0.01
Transaction Fee = 0.001 ZDKL-PTT
Continue
PTT (1.7.2-macOS)

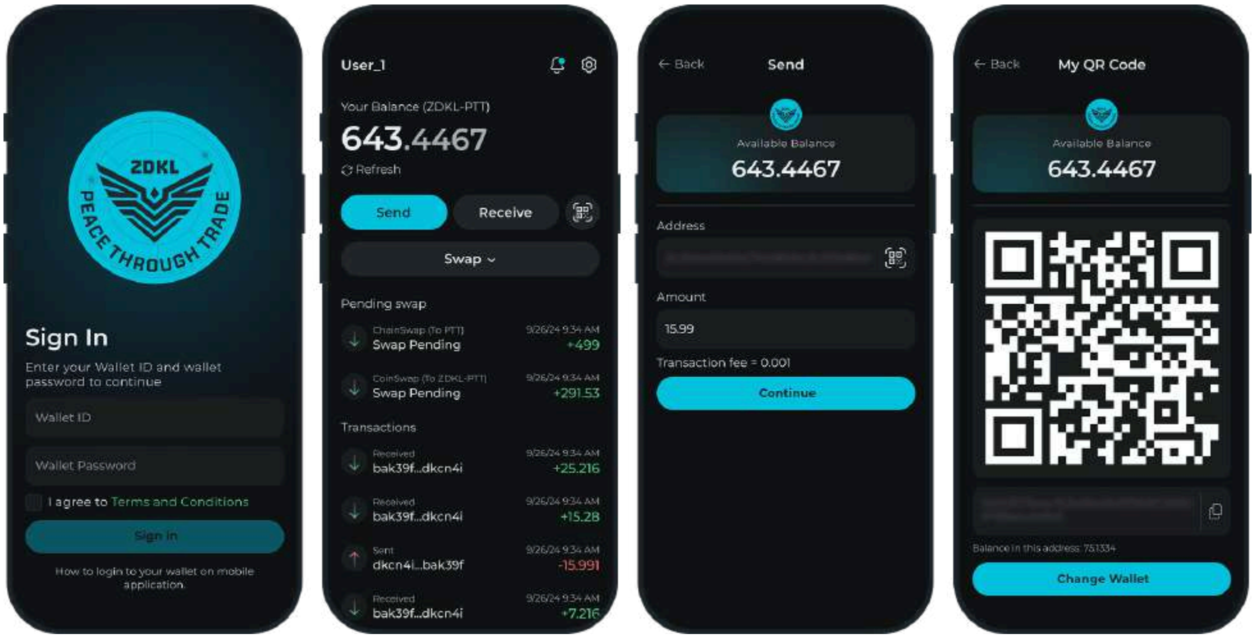

PTT Blockchain & ZDKL-PTT Coin Wallet
PTT Block Explorer
Lock Wallet
← Back
ChainSwap
ChainSwap (PTT to Other Chains)
Balance Available: 0.6742 ZDKL-PTT
Amount to swap (ZDKL-PTT)
10
Receiving Network
Polygon Network
Please enter your receiving wallet address in the Polygon Network only. If you enter a receiving address in an incorrect network, your funds will be permanently lost.
Receiving Address
0x1ubJ31cofhdqU95x11ij472U6dasV6QLcJV8s23d
Estimated Fee ≈ 0.001 ZDKL-PTT
Swap
Pending ChainSwap
Date
Swap to
Amount
PTT


PTT Blockchain & ZDKL-PTT Coin Wallet
PTT Block Explorer
Lock Wallet
← Back
ChainSwap
ChainSwap (Other Chains to PTT)
Amount to swap (ZDKL)
10
Swap from
Polygon Network
Receiving address (PTT)
bFo39nGasdnm1mRePuavUT4nS2Kx4VmVyn
Estimated Fee ≈ 0.001 ZDKL-PTT
Continue
Pending ChainSwap
Date
Swap from
Amount
Tnx
No pending ChainSwap
PTT (1.7.2-macOS)

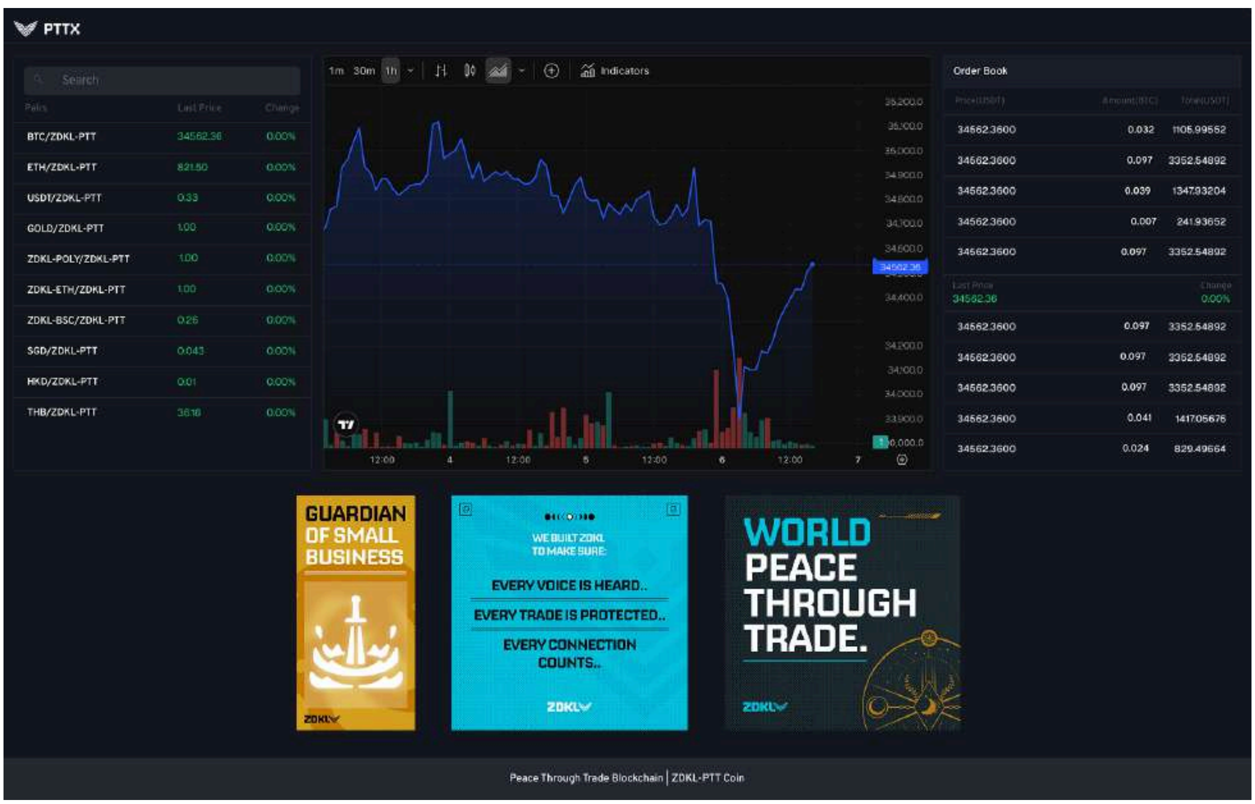




ZDKL-PTT Wallet Desktop Application

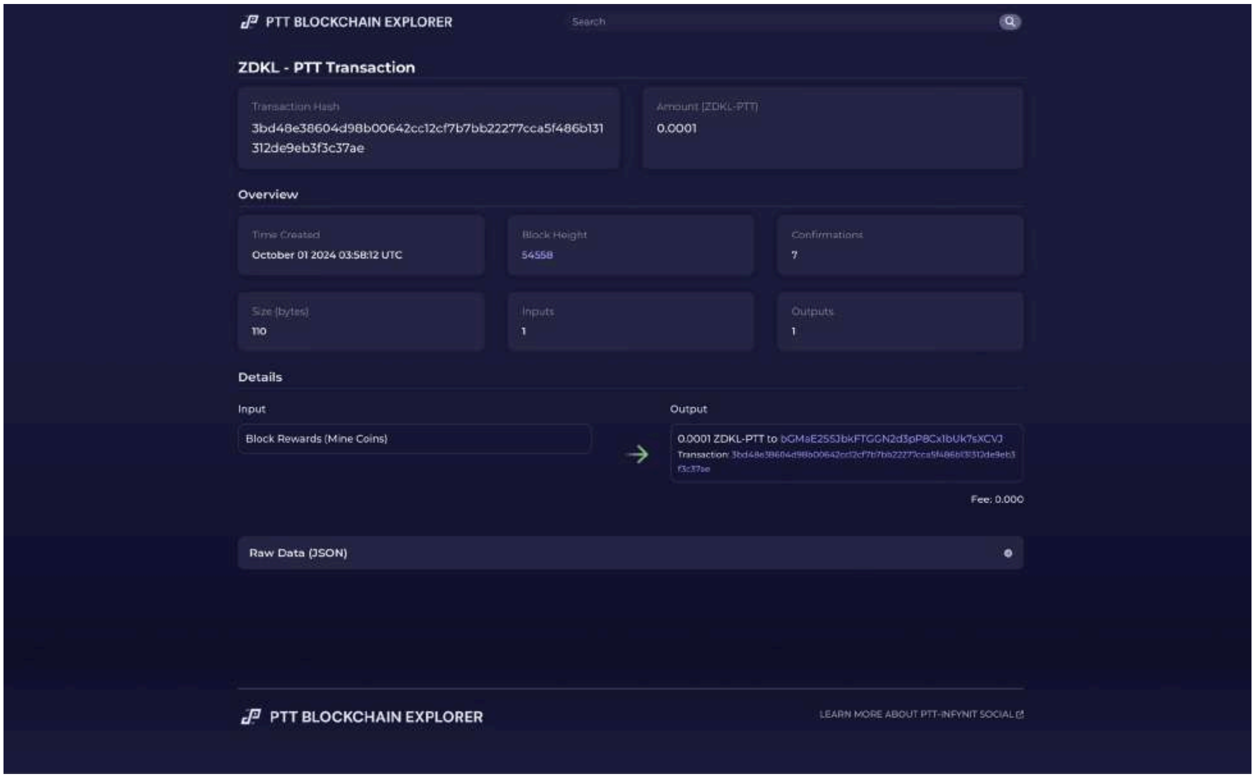


ZDKL-PTT Wallet Mobile Application



PTT Exchange

C. Blockchain Explorer:



To enhance transparency and trust within the ecosystem, the PTT blockchain features a blockchain explorer. This tool allows users to search and verify all transactions, blocks, and wallets on the network, providing complete visibility into blockchain activity. The explorer empowers users to monitor their transactions and gain insights into the overall health and performance of the PTT blockchain.

D. Store of Value:

The ZDKL-PTT coin is dedicated to enhancing user experience within the PTT PoW blockchain system, serving as a decentralized utility coin that embodies simplicity, a store of value, and functional utility. It is not intended to be an investment vehicle, ensuring compliance with regulatory standards while reinforcing its role as a functional utility coin.

E. Decentralized Mining:

The PTT blockchain employs a PoW consensus mechanism, promoting decentralized mining by requiring miners to solve complex mathematical problems to validate transactions and add new blocks. This approach enhances network security, reduces reliance on centralized authorities, and fosters a community-driven ecosystem.

F. User Empowerment:

The design principles prioritize user empowerment by integrating mining capabilities within the ZDKL-PTT wallet application. Users can directly participate in the network's transaction validation, fostering greater engagement and community involvement.

G. Scalability and Efficiency:

The straightforward PoW mechanism and single-coin structure contribute to the overall scalability and efficiency of the PTT blockchain. The blockchain transactions are designed to take approximately 3-5 seconds, ensuring that it can adapt to future growth while maintaining robust security and operational integrity.

	ZDKL-PTT	Bitcoin	Ethereum (PoW)	Dogecoin	Litecoin
Avg. Transaction Fee	0.001	$1 to $5	$5 to $50	$0.01 to $0.10	$0.01 to $0.10
Transaction Speed	≈ 3 - 5 seconds	10 minutes	15 seconds	1 minute	2.5 minutes
Sustainability	Suppliers using solar energy align with environmental goals by enhancing sustainability and reducing carbon footprints.	High energy consumption has led to criticism for its environmental impact, though some mining operations use renewable energy.	Energy-intensive and less sustainable than Proof of Stake (PoS), but offers faster block times compared to Bitcoin.	More energy-efficient than Bitcoin, with lower difficulty and faster block times.	Similar to Dogecoin, it is more energy-efficient than Bitcoin but still utilizes Proof of Work (PoW).
Miner Earnings	.0001 ZDKL	6.25 BTC	2 ETH	10,000 DOGE	12.5 LTC
Decentralized	Yes	Yes	Yes	Yes	Yes
Marketcap	TBD	$1,241,535,936,771	323,063,450,280	$15,447,409,781	$4,746,596,335

H. Enhancing User Interaction:

To foster widespread adoption, the PTT application will focus on user experience and accessibility:

Intuitive User Interfaces: Developing a simple process for using ZDKL-PTT Wallet features and PTT Blockchain Explorer. Mobile Accessibility: Ensuring that the application is optimized for mobile devices, allowing users to engage with the PTT ecosystem from anywhere.

Users should be aware that the value of the ZDKL-PTT Coin may fluctuate due to market dynamics and could potentially decrease to zero. This reflects its role as a utility coin rather than an investment asset. The coin's value is determined by its practical applications within the PTT blockchain, independent of centralized management or investment strategies.

4- ZDKL-PTT Blockchain, AI-Powered Decentralized & Core Mining System Initial Launch Infrastructure

High-Performance, Scalable Proof-of-Work Network

Introduction

Blockchain Architecture & Technology Overview

Scalability, Security, and Compliance

A. Blockchain Structure:

The ZDKL-PTT PoW blockchain utilizes the SHA-256 encryption algorithm, a similar cryptographic standard that is used for Bitcoin. This ensures that the network remains highly resistant to attacks and unauthorized tampering, safeguarding users and maintaining trust in the platform.

B. Proof-of-Work Consensus:

ZDKL-PTT employs the Proof-of-Work mechanism to validate and secure transactions. Miners compete to solve cryptographic puzzles, ensuring that the network remains decentralized, secure, and immutable. This consensus model prevents double-spending and unauthorized manipulation, making the PTT blockchain a secure environment for B2B transactions and decentralized applications.
The ZDKL-PTT Blockchain is a next-generation Proof-of-Work (PoW) platform designed to power secure, decentralized digital economies. The core system supporting the initial

launch is built with a scalable architecture across 40 enterprise servers, 160TB of SSD storage, with offloading to decentralized storage for backups. ZDKL-PTT delivers high throughput, decentralized governance, full node synchronization, and fast disaster recovery.

An integrated internal private AI layer ensures 24/7 security monitoring, predictive maintenance, and AI-powered customer support, allowing the system to operate autonomously, protect user assets, and scale to millions of users with minimal human intervention.

Hardware Configuration

- Dual Enterprise CPU contain 28 Cores / 56 Threads
- 128GB DDR4 ECC RAM
- SSD/SAS storage (RAID)
- 4x 1GbE or optional 10GbE if equipped
- 1U rackmount (40U = 1 full rack)

Total Cluster Resources

Resource	**Cluster Total (40 Units)**
CPU Cores	1,120 Cores (2,240 Threads)
RAM	5.1 TB ECC DDR4
Storage	100TB – 300TB+ (RAID dependent)
Network Ports	160 Gigabit ports (or 40 x 10GbE with upgrade)
Power Draw	~30–35kW peak load (datacenter-grade)

Blockchain Deployment Plan (with 40 Servers)

i. Full Blockchain Infrastructure

- 20 Nodes as full + archival nodes across different jurisdictions for decentralization
- 10 Dedicated Miners for internal or incentivized mining pools
- 5 High-availability API clusters with automatic failover + load balancing
- 3 Explorer servers for real-time public and enterprise-grade indexing
- 2 Governance and Oracles to support decentralized governance and external data feeds

ii. Performance Capacity

Feature	**Estimated Capacity**
Concurrent Wallet Users	200,000+ users (scalable to 1M+)
TPS (Sustained)	3,000 – 6,000+ TPS with advanced load balancing
Mining Power	Equivalent to 10,000+ CPU threads mining
Explorer/API Requests	Up to 1M+ requests per day across clusters
Smart Contract Hosting	Host parallel execution VMs or WASM containers
Redundancy	Full failover, backups, containerized services across data centers
Disaster Recovery	Capable of hot/cold backups with full-node syncing under 30 minutes

iii. Use Cases You Can Power

Target Domain	What You Can Run
Global peer-to-peer Payments Backbone	ZDKL-PTT cross-border transfers, compliance enforcement, and merchant terminals
North America and Asia Node Network	Infrastructure across North America, Thailand, Vietnam, Singapore, Malaysia
Developer/Research Platform	Give devs nodes, sandbox chains, APIs for academic and business R&D
Web3 Platform Hosting	Web3 platforms, game platforms, DAO infrastructure
Data Layer / Blockchain AI Oracle	Launch decentralized compute and data feeds for AI/ML contracts or sensor networks

ZDKL-PTT Blockchain Infrastructure Overview

Component	Deployment
Blockchain Layer	ZDKL-PTT Blockchain (custom PoW, WASM-ready)
Consensus Mechanism	CPU-based Proof-of-Work Mining
AI Operations Layer	Security Monitoring, Maintenance, Support AI
Hardware Infrastructure	40 Enterprise Servers

i. Hardware Overview

Total Resources for 40 Servers:

- CPU: 28 cores per server × 40 servers = 1,120 cores / 56 threads per server × 40 servers = 2,240 threads
- RAM: 128GB per server × 40 servers = 5.1 TB ECC DDR4
- Storage: 4TB per server × 40 servers = 160TB SSD Storage
- Networking: Assuming 10GbE networking for high throughput and redundancy, the total networking capacity can support 40 servers at 10GbE.

Summary of Initial Launch Total Capacity:

- CPU Cores: 1,120 cores (2,240 threads)
- RAM: 5.1 TB ECC DDR4
- Storage: 160 TB SSD
- Networking: 10GbE for each server (total of 40 nodes)

This infrastructure provides significant computational power, storage, and high-speed networking suitable for running a high-performance blockchain like ZDKL-PTT.
Total Cluster Resources (40 Units for Initial Core System)

Resource	Total
CPU Cores	1,120 Cores (2,240 Threads)
RAM	5.1 TB ECC DDR4
Storage	100–300TB (RAID dependent)
Power Draw	~30–35kW (Data center-grade)

ii. Blockchain Node Deployment Plan

Node Type	Server Count	Purpose
Full Nodes	10	Blockchain synchronization and block propagation
Archival Nodes	10	Full transaction and smart contract history
Mining Nodes	10	CPU-based mining clusters (internal and incentivized pools)
API Gateway Cluster	5	Access endpoints for wallets, transactions, APIs
Explorer/Indexing Nodes	3	Real-time blockchain search and indexing
Governance / Oracle Nodes	2	On-chain voting systems, decentralized external data feeds

iii. Performance Profile

Feature	Estimated Capacity
Concurrent Wallets	500,000+ (scalable to 1M+)
Sustained Transactions	3,000–6,000+ TPS
API/Explorer Requests	1M+ requests/day
Blockchain Sync Time	<30 minutes for full-node disaster recovery

Redundancy	Full failover via containerized services
Smart Contracts	Parallel execution via WASM containers

iv. AI System Deployment

Function	Node Count	Purpose
Security + Intrusion Detection	3	Real-time blockchain security monitoring
Predictive Maintenance + Load Balancing	3	Server health prediction and dynamic load balancing
AI Customer Support	4	Automated user assistance and ticket resolution

v. AI-Enabled Operations

AI Feature	Performance
Threat Detection	1–2 seconds latency
Server Health Prediction	95%+ accuracy with continuous learning
Load Balancing Speed	<2 seconds dynamic reroute
Customer Service Response	1–3 seconds via AI chatbot
Scalability	Up to 10M+ users

Notes:

- AI constantly audits blockchain transactions, detecting anomalies (e.g., failed login patterns, wallet attacks).
- Predictive Maintenance AI forecasts server failures and automatically reroutes services.
- AI Customer Support resolves common wallet and transaction issues without human intervention.

All AI software runs privately on owned infrastructure for full data control.

vi. Blockchain Security, Governance, and Recovery

- Governance Layer: Voting-enabled smart contracts for protocol upgrades and parameter changes.
- Oracles: AI-fed external data feeds for smart contracts and governance voting.
- Disaster Recovery: Full hot/cold backup system with blockchain resync times <30 minutes.

Security is proactively handled via continuous AI surveillance across the chain, servers, and APIs.

vii. Strategic Outcomes

By deploying ZDKL-PTT Blockchain with AI automation, the system achieves:

- Massive Scalability: Handling millions of transactions and users with minimal human overhead.
- Resilient Operations: Hot-swap redundancy, fast node recovery, disaster resilience.
- Autonomous Security: AI-driven monitoring and threat mitigation.
- Future-Proofed Architecture: WASM support, decentralized governance, and containerized node scaling.

5- AI Integration and Capabilities

AI-Driven Infrastructure

The AI-Powered Autonomous Control Architecture is being designed as an intelligent decision-making framework to automate infrastructure management, software lifecycle, system health monitoring, user-driven optimization, and security response. It dynamically scales resources based on real-time node loads, predicts failures for proactive maintenance, and ensures continuous software upgrades without disruption. By analyzing hardware metrics and user behavior patterns, it autonomously adjusts system parameters and isolates faulty nodes to maintain stability. Integrated AI-based security analytics detect abnormal traffic and potential threats, enabling automated protection. This architecture enhances resilience, efficiency, and adaptability across complex, distributed environments.

Three different AI systems are used to:

- **AI-driven insights and queries** for the blockchain network, including the ability to track performance and suggest or implement changes.
- **Help monitor the security** of your blockchain nodes, ensuring that everything is secure from unauthorized access, vulnerabilities, or attacks.
- **Provide real-time security** monitoring for the system, looking for abnormal behaviors indicative of a threat, such as unauthorized access or misuse of system resources.

AI Applications

- Security & Intrusion Detection: AI monitors and identifies suspicious network, blockchain, and account activities
- Predictive Maintenance: AI nodes detect and prevent potential system failures across nodes and clusters
- User Support and Commerce Assistance: AI-based assistants help merchants optimize profiles, pricing, and content
- Smart Contract Governance: AI assists in optimizing and validating governance-related smart contract processes

Conclusion

ZDKL-PTT Blockchain represents the next frontier in decentralized, AI-managed infrastructure. Designed for global-grade reliability, scalability, and autonomy, it establishes a new model for blockchain ecosystems — secure, efficient, and ready for the future of decentralized finance, digital identity, and programmable commerce.
The integration of an AI Operations Layer ensures that ZDKL-PTT is not only a blockchain but also a self-healing, self-securing, self-supporting decentralized system.

6- Decentralized Community Mining, Miners Rewards and Fees: How ZDKL-PTT and PTT Blockchain Works

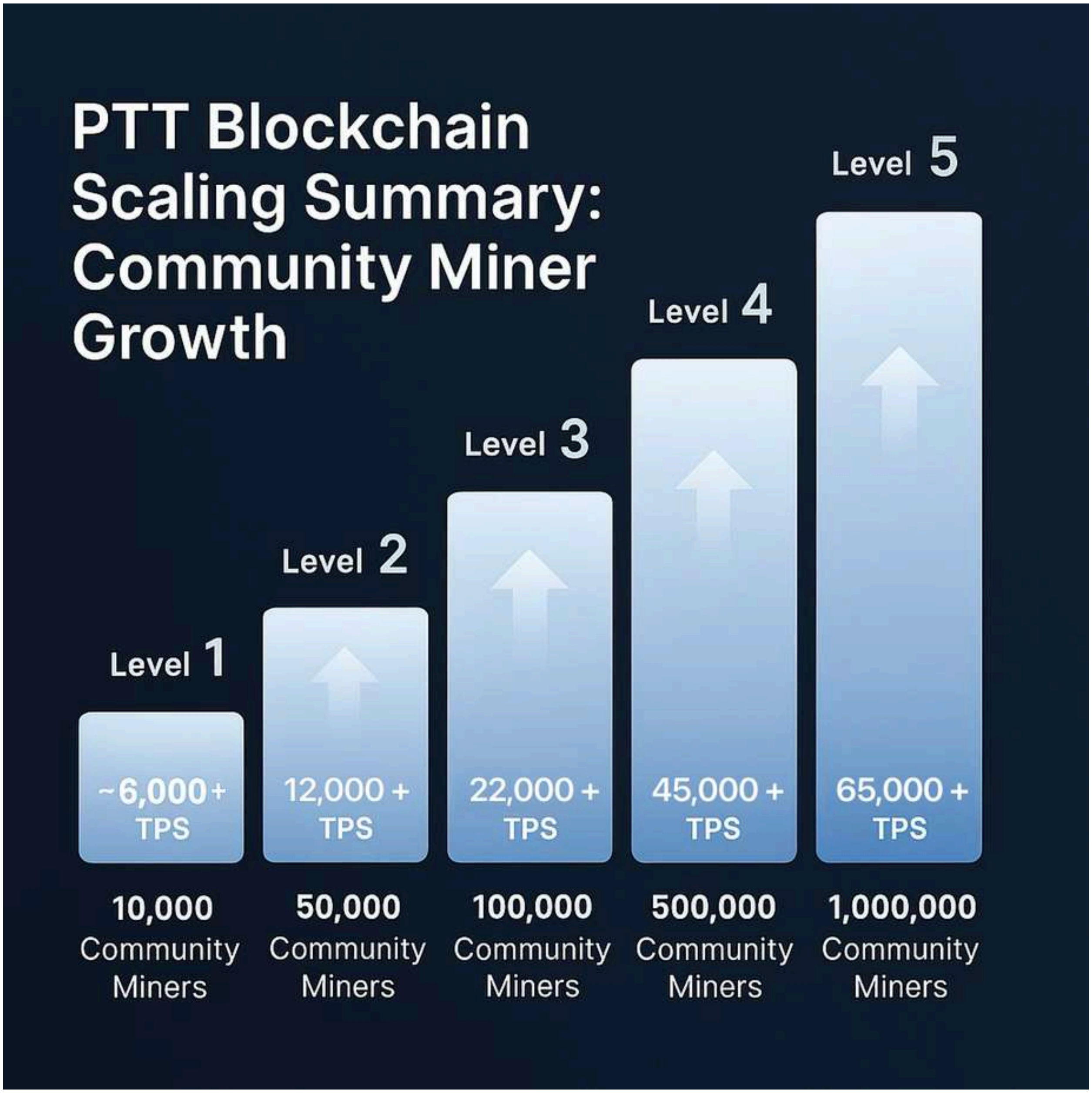
Decentralized Community Mining

PTT Blockchain Scaling Summary: Community Miner Growth and the Creation of a Truly Community-Driven, Decentralized "Peace Through Trade" Blockchain

Overview

- Community Miners: Individuals using their personal PCs to mine and validate the PTT blockchain.
- ZDKL-PTT: The core token mined on the PTT Layer 1 blockchain.
- Scaling Effect: As the number of miners grows, the blockchain becomes more decentralized, more secure, and higher throughput (more transactions per second - TPS).

Approximate Scaling Levels



Level 1: 10,000 Community Miners

- Hashrate: Solid baseline distributed globally.
- TPS Capability: ~6,000+ TPS (already modeled with server infrastructure).
- Decentralization: Moderate — foundation for geographic and network expansion.
- Security: High — resistant to 51% attacks due to distributed PC mining.
- Use Cases: Peer-to-peer transactions, e-commerce adoption, social platform early users.

Level 2: 50,000 Community Miners

- Hashrate: 5x increase.
- TPS Capability: Up to 12,000+ TPS (optimized peer-to-peer traffic).
- Decentralization: Strong — multi-country distribution.
- Security: Very High
- Use Cases: Mass adoption for peer-to-peer transactions, e-commerce, high-velocity marketplaces.

Level 3: 100,000 Community Miners

- Hashrate: 10x original baseline.
- TPS Capability: 22,000+ TPS (global routing efficiency).
- Decentralization: Extremely strong — true global coverage.
- Security: Ultra-high
- Use Cases: National level e-commerce networks, mid-size banks/financial institutions using stablecoins for settlements.

Level 4: 500,000 Community Miners

- Hashrate: 50x original baseline.
- TPS Capability: 45,000+ TPS (optimizations like sharding-lite activated).
- Decentralization: Maximal — across every continent.
- Security: Ultra-high, self-healing — even if thousands of nodes go offline.
- Use Cases: Cross-border remittance platforms, regional government partnerships, major social and marketplace platform scaling.

Level 5: 1,000,000 Community Miners

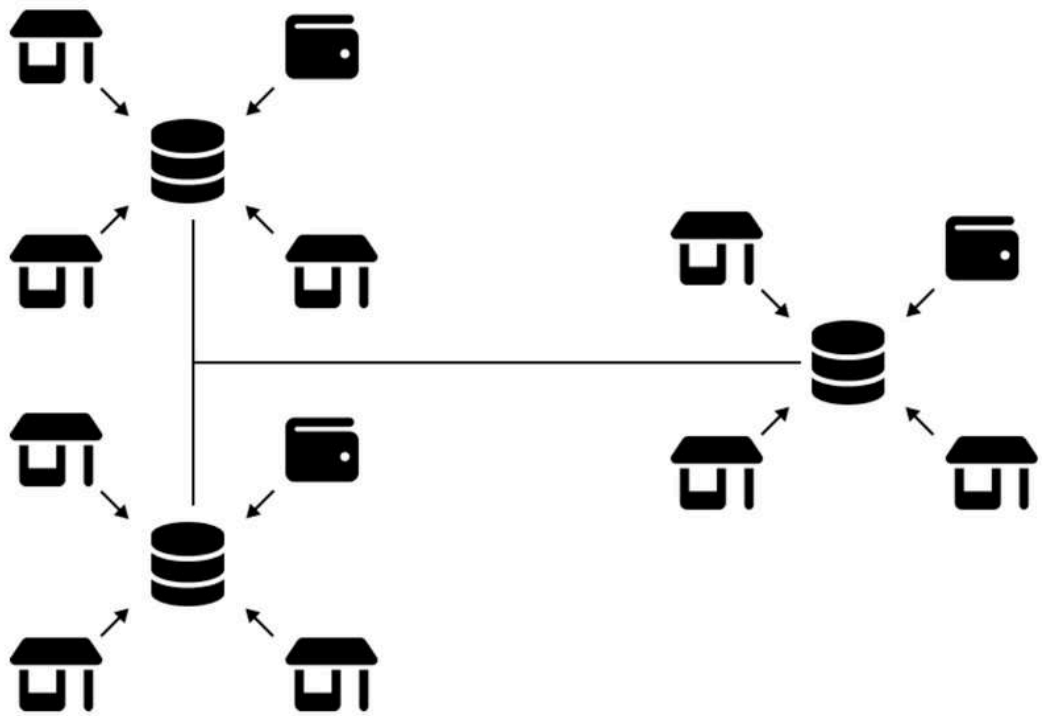
- Hashrate: 100x original baseline.
- TPS Capability: 65,000+ TPS (global mesh network effects, micro-optimizations).
- Decentralization: Unprecedented — largest distributed Proof-of-Work (PoW) community globally.
- Security: Ultra-high, self-healing — true people's chain.
- Use Cases: Nation-scale peer to peer support, multinational commerce, full smart city integrations, global Web3 platforms.

Key Outcomes

- Community Mining Creates More Scalability: Increases exponentially — TPS scales faster than linear with more nodes.
- Community Mining Creates more Security: Grows proportionally with miner participation — securing assets, transactions, and user trust.

- Community Mining Creates Maximum Decentralization: Protects against censorship, regional failures, and network control.

Miners Rewards and Fees



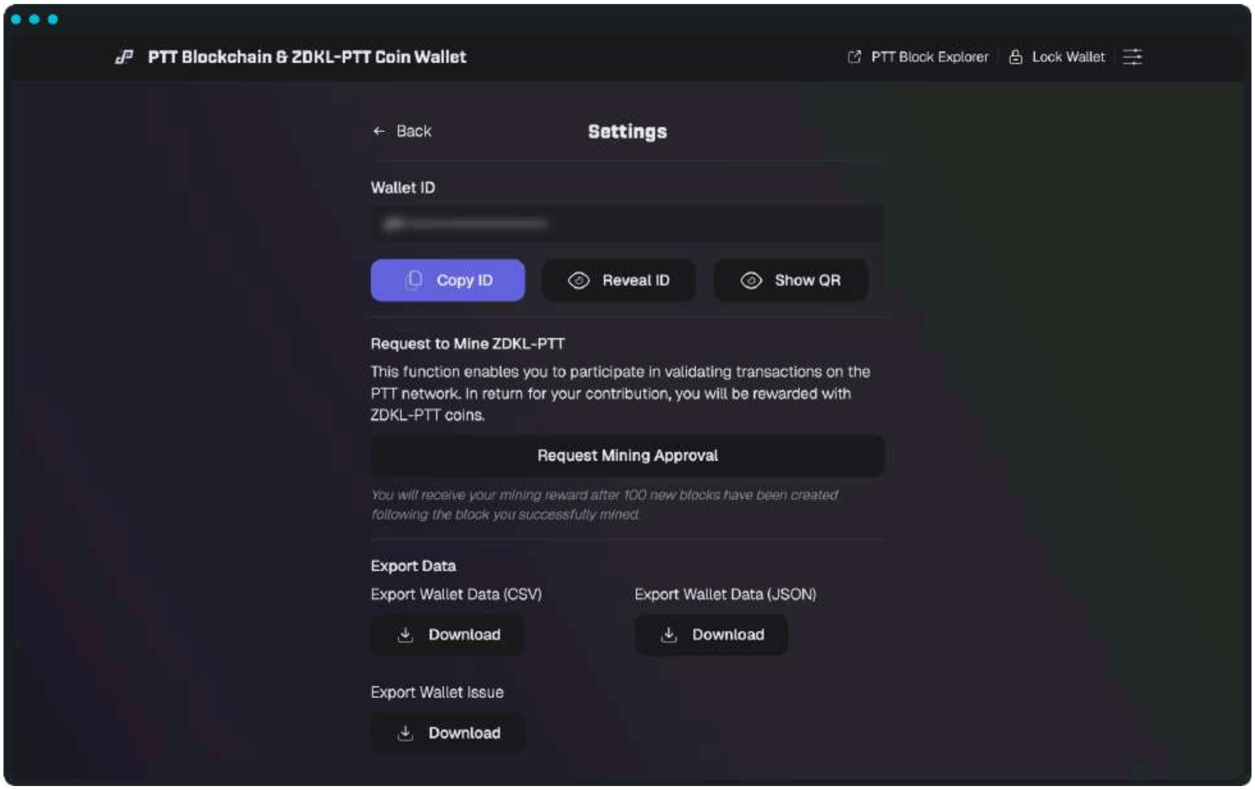
ZDKL-PTT is integral to the operation of the PTT blockchain. Unlike conventional investment vehicles, it functions as a transactional medium and incentive mechanism for miners. Here's how:

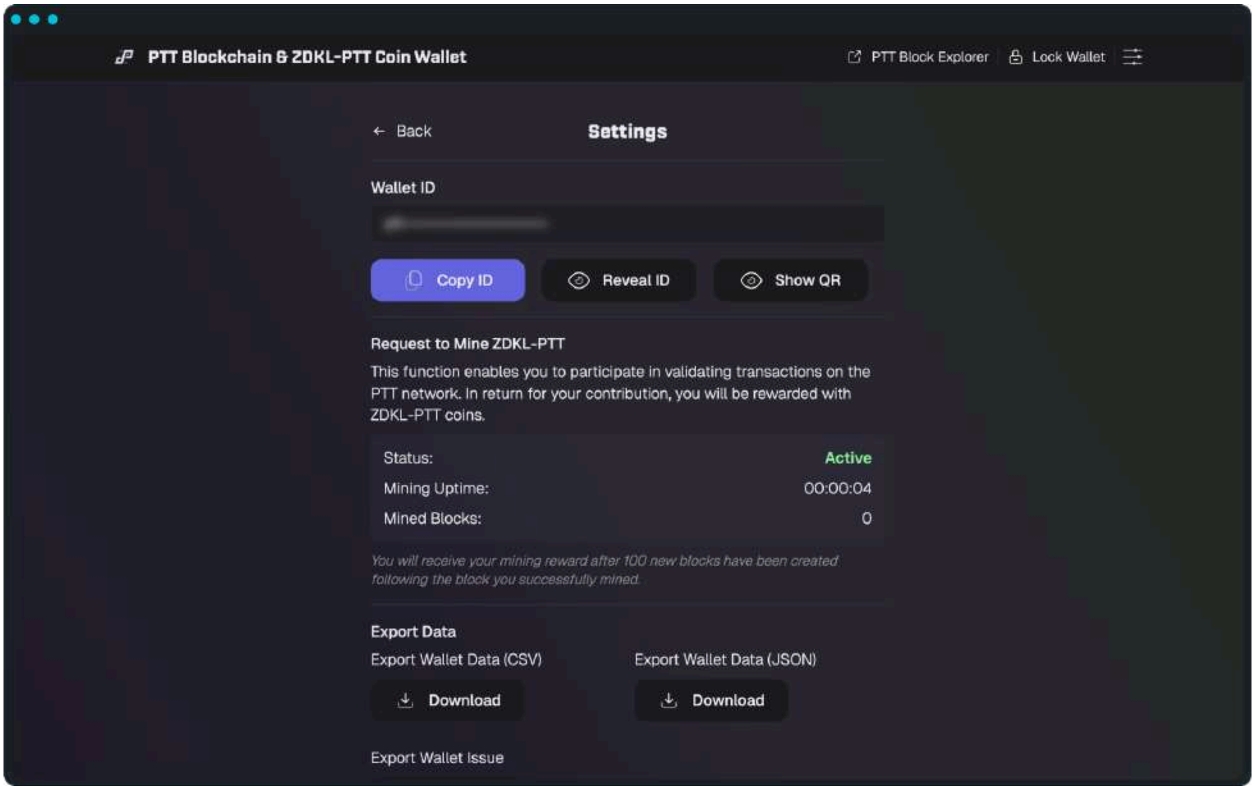
A. Miner Block Rewards:

Miners receive compensation for their essential role in maintaining the blockchain's security through a block reward of 0.0001 ZDKL-PTT per block mined. This reward reflects their computational efforts to validate transactions and secure the network, rather than being driven by speculation.

B. Transaction Fees:

Users incur a fee of 0.001 ZDKL-PTT per transaction. These fees support the efficiency and scalability of the network. The necessity of ZDKL-PTT for conducting transactions within the ecosystem emphasizes its inherent utility, distinguishing it from speculative assets.





ZDKL-PTT Wallet Desktop Application - Mining

ZDKL-PTT Wallet Application: Acting as a Node in the PoW Blockchain
The ZDKL-PTT wallet application is designed not only as a user-friendly interface for managing ZDKL-PTT Coins but also as an integral node in the Proof of Work (PoW) blockchain network. By enabling users to participate actively in the blockchain's operations, the wallet enhances decentralization and strengthens the overall security of the network.

A. Node Functionality:

Each instance of the ZDKL-PTT wallet operates as a node within the blockchain network. This means it maintains a complete copy of the blockchain, validates transactions, and contributes to the consensus mechanism essential for the PoW system. As a node, the wallet application ensures that transactions are confirmed and added to the blockchain in a secure and decentralized manner, thereby reinforcing the integrity of the entire network.

B. Public Mining Participation:

As the ZDKL-PTT ecosystem evolves and new functions are released, the wallet application will enable users to participate directly in mining activities. This feature allows users to leverage their computing power to contribute to the network's security and transaction validation while earning rewards in ZDKL-PTT Coins. By transforming the wallet into a mining tool, users can actively participate in maintaining the network, fostering a sense of community and engagement. Rather than relying solely on centralized mining pools, individual users can mine ZDKL-PTT Coins directly from their wallets, promoting a more inclusive and decentralized mining environment. This aligns with the overall vision of the PTT blockchain, which prioritizes user participation and community-driven growth.

Comparative Analysis: Dogecoin vs. ZDKL-PTT

Feature	Dogecoin	ZDKL-PTT
Consensus Mechanism	Proof-of-Work (PoW)	Proof-of-Work (PoW)
Block Time	~1 minute	~2.5 minutes
Block Size	1 MB	Few KB
Chain Size (2025)	~90 GB	~35–50 GB
Transaction Throughput	~33 TPS	3,000 – 6,000+ TPS
Smart Contract Support	Limited	Custom WASM engine
AI Integration	None	Integrated AI capabilities

Marketplace Support	None	Full peer-to-peer commerce platform
Identity Management	None	DID-based system

7- Quantum-Resistant Design Roadmap

The PTT blockchain is architected with long-term security in mind, ensuring it remains robust as quantum computing advances. While SHA-256—the current hashing standard—remains highly secure and is not considered vulnerable to practical quantum attacks at this time, the system's roadmap includes implementing a hybrid hashing approach. As quantum computing matures, the blockchain will integrate SHA-3 or other quantum-resistant algorithms alongside SHA-256. This dual-hash framework ensures the blockchain can seamlessly transition to stronger protections when necessary, maintaining data integrity and network security well into the future.

8- Why ZDKL-PTT Coinomics model is a functional Utility Coin model, Not a Security Investment

A. No Expectation of Profit:

The primary purpose of ZDKL-PTT is to provide access to services and dApps on the PTT blockchain, rather than to generate profits for holders. Although market value may fluctuate, the Coin is designed for practical use. Users acquire and hold ZDKL-PTT to facilitate transactions or engage in decentralized services, not for speculative investment.

B. Coin Use Tied to Platform Access and Services:

ZDKL-PTT is essential for participating in the PTT ecosystem. It enables micropayments, executes smart contracts, and grants access to dApps, reinforcing its role as a functional digital coin for blockchain operations. This functionality eliminates any perception of the Coin as an investment instrument.

C. Decentralized Control and Efforts of Others:

The value of ZDKL-PTT derives from the platform's utility and user activity, not from the efforts of a centralized entity or promises of future profits from the founding team. The decentralized nature of the blockchain, with miners validating transactions and securing the network, further disperses control over the ecosystem. Coin holders are thus not reliant on a third party for financial gain.

D. No Investment of Money for Common Enterprise:

When individuals acquire ZDKL-PTT Coins, they do so for practical use within the ecosystem—processing transactions or engaging with smart contracts—rather than pooling funds in anticipation of returns from a common enterprise. The decentralized, functional nature of the platform ensures that users are seeking specific services, not acting as investors in a collective initiative.

Public Market Participation

The allocation of 20% of Coins for public market distribution enables broad participation in the ZDKL-PTT ecosystem via decentralized exchanges (DEXs). It is vital to emphasize that DEX listings facilitate the distribution of utility Coins globally. Users can buy and trade ZDKL-PTT primarily for functional purposes—facilitating transactions, powering dApps, or accessing decentralized financial services—not as speculative investment platforms.

9- Multi-Network Integration

Cross-Chain Interoperability and Broad Market Participation

The ZDKL-PTT Coin exists not only within the PTT PoW blockchain but also as ZDKL-ETH (on Ethereum), ZDKL-MATIC (on Polygon), and ZDKL-BNB (on Binance Smart Chain). This cross-chain minting ensures interoperability across leading blockchain networks, allowing for broader market participation and facilitating decentralized finance (DeFi) applications. However, ZDKL-PTT retains its primary utility on the PTT blockchain, maintaining its decentralized, utility-first architecture.

Cross-Chain Adoption Strategy

ZDKL-PTT serves as the core blockchain and native coin of the network, providing the foundational security and utility layer. To promote widespread adoption and enhance usability across the broader token economy, ZDKL is also minted on multiple blockchain networks—including Ethereum (ZDKL-ETH), Polygon (ZDKL-MATIC), and Binance Smart Chain (ZDKL-BNB). This cross-chain approach allows seamless 1-to-1 exchanges between ZDKL-PTT and its counterparts on other networks, enabling inclusive interaction with a wide range of digital assets and decentralized applications. ZDKL is issued in a capped supply of 100 million coins, ensuring controlled circulation and long-term value stability

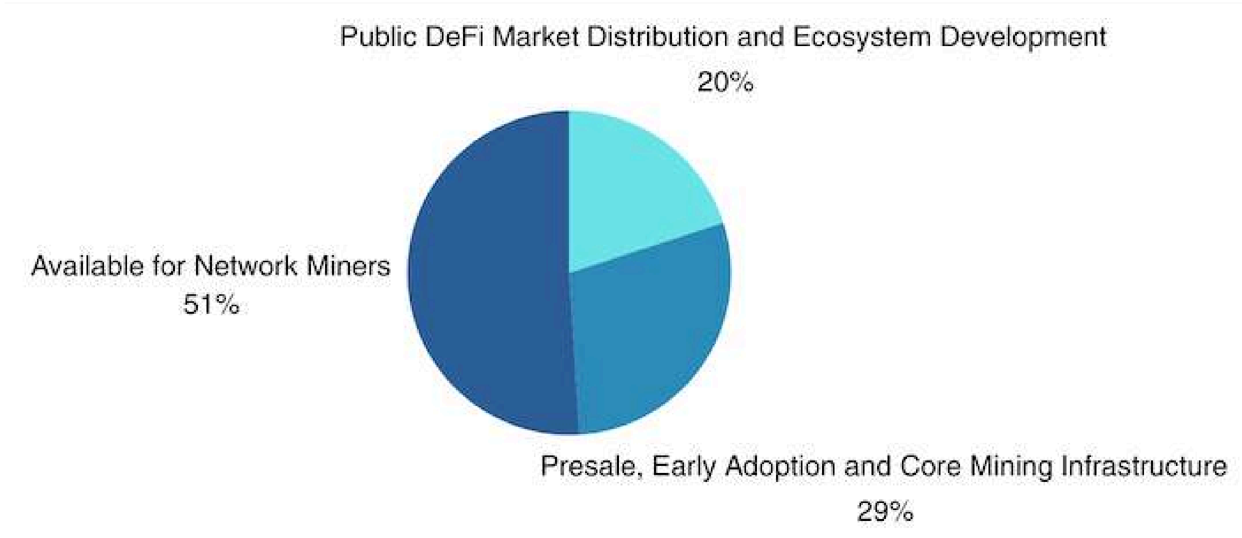
Key points of cross-chain functionality include:

- 1:1 Coin Exchange: Users can exchange ZDKL Coins across networks while maintaining consistent value.
- DeFi and Decentralized Applications: Through integration with leading blockchains, ZDKL Coins can be used for decentralized finance, staking, and liquidity pool participation across multiple ecosystems.
- Utility-First Model: Despite cross-chain functionality, ZDKL-PTT is not designed as an investment Coin. Its primary utility is to facilitate transactions within the PTT blockchain ecosystem.

10- Utility for Second-Layer Applications (Second Layer Whitepaper)

For detailed information on second-layer applications, including social, media, and marketplace, please refer to the Second Layer Whitepaper document

11- Coinomics of ZDKL-PTT



Total Supply and Allocation

ZDKL-PTT has a fixed total supply of 100 million Coins, strategically allocated among various stakeholders to support its function as a utility Coin:

Presale, Early Adoption and Core Mining Infrastructure (29%):
29 million Coins are reserved for our early adopters, this includes pre-sale, core mining infrastructure and strategic partners who contributed to the initial development and infrastructure of the ZDKL-PTT ecosystem. This allocation acknowledges the pivotal role these individuals and entities played in shaping the platform, recognizing their support rather than serving purely speculative interests.

Public DeFi Market Distribution and Ecosystem Development (20%):
20 million Coins will be made available to the public through decentralized exchanges (DEXs). This allocation allows anyone interested to participate in the ecosystem, facilitating transactions and the use of decentralized applications (dApps) while promoting broad community engagement.

Available for Network Miners (51%):
51 million Coins are designated for miners, who are crucial for securing the network. Additionally, these Coins will fund future projects and applications within the PTT ecosystem, driving innovation and enhancing the platform's utility.

12- System Security Update

In the initial phase, as the ZDKL Coin is released for decentralization, the founders reserve the right to update the mining algorithm and reward structure in response to organized malicious attacks on the system. These updates are essential to ensure the integrity and sustainability of the network, allowing it to effectively fulfill its purpose while transitioning towards full decentralization.

This proactive approach to system security is vital in protecting the ecosystem and maintaining user trust.

Reference: Möser, M., & Böhme, R. (2018). "Blockchain-based Security for Digital Currency: Implications and Opportunities." Journal of Cybersecurity and Privacy, 1(1), 10-25.

In this article, the authors discuss the importance of adaptive security measures in blockchain systems, highlighting that timely updates to mining protocols and reward mechanisms can mitigate the effects of organized attacks and enhance the network's integrity. They emphasize that such proactive strategies are critical in maintaining trust and ensuring the continued functionality of decentralized networks.

Conclusion

The ZDKL-PTT Utility Coin and the associated PTT application represent a significant step forward in creating a decentralized, efficient, AI integrated, and sustainable blockchain ecosystem. By focusing on user engagement, security, and community collaboration, the PTT blockchain will continue to provide a decentralized network system to connect the global community seeking to share information.

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- This whitepaper outlines the decentralized framework and cross-chain compatibility of Binance Smart Chain, supporting the claim that ZDKL-BNB can interact with the PTT blockchain ecosystem.

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- This book discusses the fundamentals of Bitcoin's single-coin approach in a decentralized system, reflecting ZDKL-PTT's design philosophy of simplicity and efficiency.

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- Provides insights into public distribution methods and miner incentives, similar to ZDKL-PTT’s 52% allocation for miners and ecosystem development.

3. Wright, A., & De Filippi, P. (2015). Decentralized Blockchain Technology and the Rise of Lex Cryptographia.

- This paper discusses the role of early adopters and community involvement in the success of blockchain platforms, paralleling ZDKL-PTT's early adopters allocation.

4. Tapscott, D., & Tapscott, A. (2016). Blockchain Revolution: How the Technology Behind Bitcoin and Other Cryptocurrencies Is Changing the World. Penguin Books.

- Focuses on public market distribution and the role of decentralized exchanges (DEXs), much like ZDKL-PTT's 20% allocation for public market participation.

5. Buterin, V. (2013). Ethereum: A Next-Generation Smart Contract and Decentralized Application Platform.

- Discusses the importance of miners in blockchain networks and the allocation of cryptocurrency to incentivize their work, similar to ZDKL-PTT’s focus on miners for network security and ecosystem growth.

Section 6

1. Nakamoto, S. (2008). Bitcoin: A Peer-to-Peer Electronic Cash System.

- This paper outlines the concept of block rewards and miner incentives, which is central to how ZDKL-PTT compensates miners with 0.0001 ZDKL-PTT per block for maintaining network security.

2. Antonopoulos, A. M. (2017). Mastering Bitcoin: Unlocking Digital Cryptocurrencies. O'Reilly Media.

- Discusses transaction fees and their role in ensuring blockchain scalability, similar to the 0.001 ZDKL-PTT transaction fees that support the PTT blockchain's efficiency.

3. Vukolić, M. (2016). The Quest for Scalable Blockchain Fabric: Proof-of-Work vs. BFT Replication.

- Provides insights into PoW consensus mechanisms, showing how nodes like those in ZDKL-PTT validate transactions and maintain blockchain integrity, aligning with ZDKL-PTT wallet node functionality.

4. Decker, C., & Wattenhofer, R. (2013). Information Propagation in the Bitcoin Network.

- This study emphasizes the role of nodes in maintaining a blockchain's decentralization and security, which supports the ZDKL-PTT wallet acting as an integral node in the PoW blockchain.

5. Buterin, V. (2013). Ethereum: A Next-Generation Smart Contract and Decentralized Application Platform.

- Highlights public mining participation and the importance of user involvement in a decentralized network, paralleling ZDKL-PTT's vision for public mining through individual wallets.

6. Tapscott, D., & Tapscott, A. (2016). Blockchain Revolution: How the Technology Behind Bitcoin and Other Cryptocurrencies Is Changing the World. Penguin Books.

- Describes the evolution of blockchain ecosystems and the development of enhanced tools for mining and participation, similar to ZDKL-PTT's future enhancements for wallet mining features.

Section 7

1. Nakamoto, S. (2008). Bitcoin: A Peer-to-Peer Electronic Cash System.

- Explains the foundational concepts of Proof of Work (PoW) mining and decentralized validation, similar to how the PTT blockchain incorporates PoW to ensure network security and integrity.

2. Antonopoulos, A. M. (2017). Mastering Bitcoin: Unlocking Digital Cryptocurrencies. O'Reilly Media.

- This resource outlines the functionality of decentralized mining, highlighting how miners validate transactions by solving mathematical problems, which directly supports the PTT application's PoW-based decentralized mining.

3. Finck, M. (2018). Blockchain Regulation and Governance in Europe.

- Describes how decentralized platforms reduce reliance on central authorities, paralleling the decentralized approach of the PTT application, where control is distributed across the community through mining.

4. SEC v. W.J. Howey Co., 328 U.S. 293 (1946).

- The landmark case outlining the "Howey Test" for determining whether an asset is a security. This is relevant to the explanation that ZDKL-PTT is a utility coin and not a security investment, as it does not meet the criteria of common enterprise or expectation of profit.

5. Murray, J. (2018). Cryptoassets: The Innovative Investor's Guide to Bitcoin and Beyond. HarperCollins.

- Discusses the difference between utility tokens and securities, supporting the argument that ZDKL-PTT Coin's primary purpose is for platform access and decentralized services, not speculative investment.

6. Zohar, A. (2015). Bitcoin: under the hood. Communications of the ACM, 58(9), 104-113.

- Explores decentralized control in blockchain networks, showing how the value of tokens like ZDKL-PTT is derived from their utility and network activity rather than the efforts of a centralized authority.

7. Tapscott, D., & Tapscott, A. (2016). Blockchain Revolution: How the Technology Behind Bitcoin and Other Cryptocurrencies Is Changing the World. Penguin Books.

- Highlights how blockchain decentralization fosters community-driven ecosystems, relevant to how ZDKL-PTT enables public market participation through decentralized exchanges (DEXs) for utility purposes.

8. Buterin, V. (2013). Ethereum: A Next-Generation Smart Contract and Decentralized Application Platform.

- Emphasizes the functional utility of coins within blockchain ecosystems for running smart contracts and dApps, supporting ZDKL-PTT's use for micropayments and decentralized services in the PTT ecosystem.

Section 8

1. Zhou, X., & Liu, Y. (2020). Decentralized Social Networks: The Future of Social Media on the Blockchain.

- Discusses the potential of blockchain technology in transforming social interactions, supporting the role of ZDKL-PTT within the Infynit Social PTT network as a facilitator of decentralized social interactions and commerce.

2. Tapscott, D., & Tapscott, A. (2016). Blockchain Revolution: How the Technology Behind Bitcoin and Other Cryptocurrencies Is Changing the World. Penguin Books.

- Highlights how blockchain technology can extend its utility beyond financial transactions to enable decentralized services, reinforcing ZDKL-PTT's diverse functionalities within the Infynit Social platform.

3. Khan, A., & Siddique, I. (2021). Blockchain for Decentralized Marketplaces: A Comprehensive Review. Journal of Blockchain Research, 1(1), 1-20.

- Reviews the framework for blockchain-based marketplaces, providing insights into how ZDKL-PTT can support digital goods purchases, premium subscriptions, and community initiatives within the Infynit Social ecosystem.

4. Bock, C. (2018). The Role of Tokens in the Development of Decentralized Applications. International Journal of Blockchain and Cryptocurrency, 1(2), 45-60.

- Examines the importance of utility tokens in decentralized applications, supporting the claim that ZDKL-PTT acts as a primary gas fee for transactions in the Infynit Social network.

5. Swan, M. (2015). Blockchain: Blueprint for a New Economy. O'Reilly Media.

- Explores how blockchain can create new economic models, reinforcing the idea that the Infynit Social platform can stimulate economic activity within the broader PTT blockchain network through its integrated marketplace.

6. Narayanan, A., Bonneau, J., Felten, E., Miller, A., & Goldfeder, S. (2016). Bitcoin and Cryptocurrency Technologies. Princeton University Press.

- Provides foundational knowledge about cryptocurrencies and their applications, underscoring how the ZDKL-PTT Coin functions as a critical transactional medium within a decentralized marketplace.

7. Gans, J. S. (2019). The Impact of Blockchain Technology on Business Models. Communications of the ACM, 62(10), 34-36.

- Discusses how blockchain can reshape business models and marketplaces, relevant to the example of Infynit Social serving as a model for second-layer applications integrating with blockchain ecosystems.

8. Catalini, C., & Gans, J. S. (2016). Some Simple Economics of Blockchain. National Bureau of Economic Research.

- Analyzes the economic implications of blockchain technology, particularly regarding decentralized services and user engagement, aligning with the objectives of the Infynit Social platform.

Section 9

1. Mok, K. (2020). Cross-Chain Interoperability in Blockchain Networks: A Review. IEEE Access, 8, 135457-135477.

- This paper reviews cross-chain interoperability mechanisms, emphasizing the importance of assets like ZDKL-PTT in facilitating interactions across multiple blockchain ecosystems, including Ethereum, Polygon, and Binance Smart Chain.

2. Zhang, Y., & Zheng, Y. (2019). The Role of Interoperability in Decentralized Finance. Journal of Financial Technology, 1(1), 23-34.

- Explores how interoperability enhances decentralized finance (DeFi) applications, supporting the claim that ZDKL-PTT's cross-chain capabilities foster broader market participation.

3. He, J., & Zhang, H. (2021). Blockchain Interoperability: A Survey and Future Directions. Future Generation Computer Systems, 115, 371-382.

- Provides insights into blockchain interoperability challenges and solutions, highlighting how ZDKL-PTT's integration across various networks enhances its functionality and user engagement.

4. Guan, L., & Liao, X. (2020). Understanding Decentralized Finance (DeFi) and Its Implications. Financial Innovation, 6(1), 1-14.

- Analyzes the DeFi landscape and its requirements, emphasizing the role of interoperable tokens like ZDKL-PTT in participating in staking, liquidity pools, and decentralized applications.

5. Xu, X., & Wang, W. (2022). Cross-Chain Asset Transfer in Blockchain Networks:

Challenges and Opportunities. Journal of Network and Computer Applications, 203, 103353.

- Discusses the mechanisms of cross-chain asset transfer, supporting the assertion that ZDKL-PTT's 1:1 coin exchange model facilitates seamless value transfer across multiple blockchain platforms.

6. Chen, J., & Wu, Z. (2021). Evaluating the Impact of Interoperability on Blockchain Ecosystems. International Journal of Information Management, 58, 102312.

- Evaluates how interoperability affects user engagement and transaction efficiency in blockchain ecosystems, relevant to ZDKL-PTT's utility-first model within the PTT blockchain.

7. Liu, S., & Lin, Z. (2020). Multi-Chain and Cross-Chain Architecture for Blockchain Systems. IEEE Transactions on Blockchain, 1(1), 34-46.

- Discusses multi-chain architectures and their significance, supporting the importance of ZDKL-PTT's cross-chain integration for enhancing its utility in various ecosystems.

8. Tian, H., & Sun, Y. (2021). Tokenomics of Cross-Chain Assets in Decentralized Finance. Journal of Blockchain Research, 2(1), 1-15.

- Investigates the economic models of cross-chain assets, highlighting how ZDKL-PTT's design prioritizes utility and transaction facilitation over speculative investment.

Section 10

1. Nakamoto, S. (2008). Bitcoin: A Peer-to-Peer Electronic Cash System.

- This foundational whitepaper introduces the SHA-256 algorithm used in Bitcoin and emphasizes the importance of a secure and decentralized blockchain, which ZDKL-PTT adopts to enhance user trust and security.

2. Narayanan, A., Bonneau, J., Felten, E., Miller, A., & Goldfeder, S. (2016). Bitcoin and Cryptocurrency Technologies. Princeton University Press.

- This comprehensive text explores blockchain architecture and the Proof-of-Work consensus mechanism, providing insights into how ZDKL-PTT employs these principles for secure B2B transactions and decentralized applications.

3. Dinh, T. T. A., Ong, S. H., Zhang, R., & Liu, R. (2017). Untangling Blockchain: A Data Processing View of Blockchain Systems. IEEE Access, 6, 22030-22041.

- Analyzes blockchain structures and data processing, supporting the significance of ZDKL-PTT's architecture in ensuring scalability and security while maintaining high performance.

4. Cohen, E. (2019). Understanding the Role of SHA-256 in Bitcoin's Security Model. Journal of Information Security, 10(3), 125-140.

- Discusses the SHA-256 encryption algorithm's role in securing blockchains, affirming ZDKL-PTT's choice of cryptographic standards to enhance resistance against attacks.

5. Zheng, Z., Xie, S., Dai, H. N., Wang, H., & Chen, X. (2018). Blockchain Technology: Applications and Recent Advances. 2018 IEEE 4th International Conference on Computer and Communications (ICCC), 262-266.

- Reviews various blockchain applications and architectures, highlighting the benefits of integrating cloud networks for scalability and security, relevant to ZDKL-PTT's design.

6. Makhdoom, I., & Makhdoom, A. (2020). Blockchain Scalability and Its Challenges: A Survey. International Journal of Information Management, 51, 102047.

- Surveys challenges in blockchain scalability, underscoring ZDKL-PTT's architecture that effectively addresses transaction handling while maintaining security and compliance.

7. Kumar, P., & Kumar, R. (2021). Blockchain Technology: A Comprehensive Overview of Architecture, Features, and Applications. Journal of King Saud University - Computer and Information Sciences, 33(8), 1084-1098.

- Provides an overview of blockchain architecture, emphasizing the security and compliance features critical to ZDKL-PTT's Proof-of-Work mechanism and overall functionality.

8. Zhao, X., & Qiu, Y. (2020). Blockchain Technology for Secure and Scalable B2B Transactions. Journal of Network and Computer Applications, 168, 102756.

- Examines blockchain's role in facilitating secure B2B transactions, relevant to ZDKL-PTT's focus on providing a secure environment for business applications through its advanced architectural design.