Summary of Capstone Project: Overview of DeFi Functions in Blockchain Explorers

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Vienna, 08 June 2025 Dilmurodov Muhammadamin

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Introduction

The rapid expansion of decentralized finance (DeFi) has transformed the blockchain landscape, offering innovative financial services without traditional intermediaries. Blockchain explorers, traditionally tools for accessing transaction histories and block details, are increasingly integrating DeFi functionalities to meet user demands for direct interaction with decentralized applications (dApps). This capstone project investigates the integration of DeFi functions within blockchain explorers, focusing on the Ethereum ecosystem, which hosts a significant portion of DeFi activity. The study evaluates 12 blockchain explorers, encompassing both general-purpose and DeFi-focused platforms, to assess their support for three key DeFi functions: Token Swapping, Staking/Yield Tracking, and Liquidity Provision. The objective is to provide a comprehensive overview of the current state of DeFi integration, highlighting strengths, limitations, and practical applications for users, thereby contributing to the understanding of how these tools can enhance DeFi accessibility.

Research Question

The primary research question guiding this project is: How effectively do blockchain explorers within the Ethereum ecosystem support key DeFi functions: Token Swapping, Staking/Yield Tracking, and Liquidity Provision and which explorers are most suitable for these activities? This question addresses the need to evaluate the extent to which explorers facilitate DeFi interactions and identifies platforms that excel in providing user friendly financial tools. By examining the availability, implementation quality, and accessibility of these functions, the study aims to inform users and developers about the current capabilities of blockchain explorers and opportunities for improvement.

Methodology

The study adopts a qualitative methodology to evaluate 12 blockchain explorers, selected based on their coverage of the Ethereum ecosystem and diversity of features. The explorers include both general-purpose platforms, which focus on blockchain data transparency, and DeFi-focused platforms, which prioritize financial interactions. The methodology comprises several key components:

- Explorer Selection: The 12 explorers were chosen to represent a balanced sample of general and DeFi-focused platforms, ensuring comprehensive coverage of the Ethereum ecosystem, including Layer 2 solutions. Selection criteria emphasized feature diversity and relevance to DeFi activities.
- Data Collection: Data was gathered from multiple sources to ensure a robust dataset:
    - Website Analysis: Official explorer websites were systematically reviewed to assess available features, user interfaces, and documented functionalities.
    - Technical Documentation: Whitepapers, API documentation, and technical resources were examined to understand each explorer's architecture and capabilities.
- Feature Analysis: The analysis focused on three DeFi functions:
    - Token Swapping: The ability to exchange one cryptocurrency token for another via integrated decentralized exchanges (DEXs).
    - Staking/Yield Tracking: Tools for staking tokens to support blockchain operations or earn yields, with features to monitor returns.
    - Liquidity Provision: Functions enabling users to add or remove liquidity from DeFi pools to facilitate trading and earn fees.

Each function was evaluated based on availability (whether integrated or requiring external tools), implementation quality (robustness and reliability), and user accessibility (ease of use for technical and non-technical users).

- Comparative Analysis: A comparative table was developed to summarize the availability of DeFi and general functions across explorers, supplemented by use case stories to illustrate practical applications.

Main Results

The analysis reveals a clear distinction between general and DeFi-focused blockchain explorers, reflecting their differing roles in the Ethereum ecosystem. General explorers, such as those providing detailed blockchain data, excel in offering transparency through features like transaction lookup, block details, and gas fee tracking. These platforms cater primarily to developers, analysts, and technically proficient users, providing robust tools for verification and debugging but lacking integrated DeFi functionalities.

In contrast, DeFi-focused explorers prioritize financial interactions, offering tools for token swapping, staking/yield tracking, and liquidity provision. The availability of these functions varies significantly across the 12 explorers:

- Token Swapping: Supported by four explorers, enabling users to exchange tokens directly through integrated DEXs, such as Uniswap or SushiSwap. These platforms aggregate price quotes and provide real-time transaction previews, enhancing efficiency.
- Staking/Yield Tracking: Available in four explorers, offering comprehensive dashboards to monitor staking rewards and yields across multiple protocols, such as Aave and Compound.

- Liquidity Provision: Supported by three explorers, facilitating the management of liquidity pools for earning trading fees, with user-friendly interfaces guiding users through the process.

The chart illustrates the number of explorers supporting each DeFi function, highlighting the prevalence of Token Swapping and Staking/Yield Tracking over Liquidity Provision.

Use-case stories further demonstrate the practical applications of these functions:

- Token Swapping: A user swapping ETH for USDT on a DeFi-focused explorer benefits from DEX aggregation, which provides optimal rates and clear transaction guidance, making the process accessible to both novice and experienced users.
- Staking/Yield Tracking: A user monitoring staking rewards across multiple protocols uses a DeFi-focused explorers portfolio dashboard, which aggregates data and provides detailed analytics, simplifying investment management.
- Liquidity Provision: A user adding liquidity to an ETH-USDT pool on a DeFi focused explorer accesses real-time pool statistics and fee earnings, with intuitive tools supporting both new and advanced users.

General explorers attract high traffic due to their role in data transparency, while DeFi-focused platforms see substantial usage from users seeking financial tools, underscoring the growing demand for DeFi integration. The findings highlight a gap in widespread DeFi functionality, as only a subset of explorers offer comprehensive support. This suggests opportunities for existing and new platforms to expand their offerings, enhancing accessibility for a broader user base. The user-friendly designs of DeFi-focused explorers, as demonstrated in use-case stories, play a

critical role in making complex financial activities more approachable, particularly for non-technical users.

Implications and Limitations

The results suggest that blockchain explorers are evolving to meet the demands of the DeFi ecosystem, with DeFi-focused platforms leading in functionality but limited in number. This presents opportunities for developers to enhance general explorers with DeFi tools, potentially increasing user adoption. However, the study's qualitative approach, reliance on publicly available data, and focus on the Ethereum ecosystem limit its generalizability. Future research could explore other blockchains, incorporate user testing, and assess security and economic aspects to provide a more comprehensive analysis.

Conclusion

This capstone project provides a detailed overview of DeFi functions in blockchain explorers, emphasizing their role in facilitating financial interactions within the Ethereum ecosystem. The distinction between general and DeFi-focused explorers highlights the need for user-centric designs that integrate advanced functionalities. By identifying leading platforms and gaps in DeFi support, the study contributes valuable insights for users and developers, paving the way for enhanced accessibility and adoption of decentralized finance technologies.