Department of Economics and Business

CENTRAL
EUROPEAN
UNIVERSITY

DEPARTMENT OF ECONOMICS AND BUSINESS 2020-2021
CAPSTONE PROJECT SUMMARY

TITLE   Research of Smart Contracts on the Ethereum Blockchain
and Product Development

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PROJECT SUMMARY

The scope of this project is analysis of transacting on the Ethereum blockchain, more specifically smart contracts and decentralized applications. Project sponsor is a company that founded one of the very important projects in DeFi. As the industry is booming, they are hiring new employees and need to train them. This project is expected to provide a new joiner guide that covers the essential concepts and conveys the core principles in order to hasten the training process.

New joiner guide named *New joiner quick-book* firstly covers basics about the platform and the latest upgrades. Secondly, it introduces decentralized financial system and compares it with the traditional one. Finally, it provides some practice examples for writing smart contracts in solidity.

Additionally, different investment approaches are compared including detailed analysis of individual cryptoassets. Content in this section provides insight to research done apart from the new joiner guide. This section represents weekly reports to the client, providing analysis of chosen cryptoassets, calculations for using different dapps, and the latest crypto news with critical commentary.

NEW JOINER QUICK-BOOK

EXECUTIVE SUMMARY

Ethereum blockchain

This part covers the introduction to Ethereum blockchain, smart contracts and decentralized applications. It then introduces the latest updates and the technological solutions for improving the current version in a way that preserves decentralization and security while improving scalability. Ethereum 2.0, shard chains, the beacon chain and docking are explained with illustrations. This is followed by the fundamental concepts such as stablecoins that are cryptoassets tied to value of current major currencies on one-to-one ratio; wallets that allow users to own cryptoassets and transact with them; exchanges that allow converting cryptoassets to other cryptoassets, or fiat in case of centralized exchanges; DAO that stands for decentralized autonomous organization; and different categories of decentralized applications including interest-earning, insurance, trading and portfolio management. Additionally, crypto indexes and possible investment reasoning are mentioned.

Traditional vs decentralized finance

This part explains in detail the mechanism of centralized exchanges in the traditional finance world and provides examples. It covers concepts of CCPs, OTC trading, financial intermediaries, HFT, and LIBOR. Potential systemic risk and challenges of the traditional financial system are indicated. Then DeFi is introduced, the two are compared and a hypothetical example of conjoin system is elaborated.

Environment & ethics

Here, most common questions regarding sustainability and ethics of the crypto world are addressed with real world comparisons with already existing phenomena. These questions include the electricity use of Bitcoin, its use for illicit purchases, and overall existence justifiability, while the answers indicate possible solutions in terms of natural energy generators such as solar and wind as well as prevailing transition to proof-of-stake concept. Potential benefits in terms of higher transaction efficiency and lower costs of the underlying technology are also mentioned.

Solidity practice

Some very simple practice examples together with a complete example are provided for the mere sake of taking a glance at solidity.

Conclusion of *New joiner quick-book*

Cryptoassets are here to stay, and the topic only starts with Bitcoin but there is much more to it – an entire booming industry. Introduction of DeFi in *New joiner quick-book* is a mere glance as it was rather designed to spark further interest in the topic by providing a broad perspective of what is currently available, and should be used in combination with other information sources.

Additional deliverables

Investment approaches

Investment strategies are described and compared. Fundamental analysis in terms of asset picking is compared to investing in an index-based portfolio. Examples of DeFi indexes are provided with detailed elaboration. Active portfolio management is then compared to passive management, and possible opportunities are highlighted when technical analysis is combined with fundamental asset knowledge. Certain techniques and ideas are proposed without undermining the underlying risk exposure.

Calculations

Various calculation tools were tailored for specific applications on Ethereum, one of which is an excel tool that in combination with VBA macros generates prices in given range, accounts for bid-ask spread and transacting fees and provides break-even level for different initial amounts. Other calculation tools include options trading, opportunity cost analysis, and margin account maintenance.

Research

Together with weekly reports, this section covers fifty different cryptoassets including the key metrics and fundamental analysis, together with critical commentary regarding specific challenges and potentials.

PROJECT CONCLUSION

To conclude, final deliverable of this project is a new joiner guide designed as a handbook to provide new employees with essential general knowledge of the DeFi industry. Project sponsor's benefit is a single document that covers the fundamental concepts without having to indicate individual elements while it also saves the employees' time of research allowing them to focus on other aspects of the training.

Student's learning experience vastly advanced understanding of blockchain technology, cryptoassets and DeFi as well as improved student's overall coding skills and specifically introduced solidity programming language the student was not familiar with before. This project encouraged student to take several other courses to be able to deal with the topic on a more profound level. Additional deliverables demonstrate student's intention to put financial knowledge into analysis of the new and yet not fully discovered area, which advanced student's critical thinking and the ability to apply concepts in a completely new environment as well as provided research reporting experience.

Finally, the student is greatly appreciative for the opportunity to work with such a leader-company and its exceptional team members.