RupiahToken

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Disclaimer: This whitepaper might be updated as the company and project progress.

Abstract

IDRT is the first crypto-asset which price is intended to mimic the value of Indonesian Rupiah. IDRT is issued by PT Rupiah Token Indonesia, an Indonesian-based startup. As an ERC-20 token built on Ethereum, IDRT inherits the speed, security, transparency, and other desirable characteristics of the Ethereum Blockchain. This combination of the Ethereum Blockchain and price stability relative to Indonesian Rupiah resulted in a digital asset that provides consumers with a stable store of value.

The main target customers of IDRT are Indonesian cryptocurrency traders who want to access global crypto exchanges. PT Rupiah Token might collaborate with third-party market makers or independent traders in cryptocurrency exchanges to help ensure IDRT price mimics Indonesian Rupiah. Branding and market education will also help in establishing market consensus among traders that the value of IDRT tracks Indonesian Rupiah. However, the ultimate price of Rupiah Token in each cryptocurrency exchanges will depend solely on market forces of supply and demand. Rupiah Token has no contractual obligation to perform buyback of IDRT from its holders and does not represent the indebtedness to the IDRT holders.

Background and Historical Context

A Brief History of Money

Over the vast history of mankind, money has been a key invention that enables humans to effectively cooperate in producing goods and services, which in turn propels the economy and civilization forward. Before the existence of money, the people of early civilizations would barter goods (such as livestock and agricultural produce) they had in surplus for the ones they lacked. This proved to be cumbersome and inefficient, as the goods are perishable and there is no standard 'unit of value'. To solve this issue, civilizations around the globe invented various forms of physical money - some were rudimentary coins made of cowrie shells (used in Indonesia's Batu Islands and West Africa), while others are more sophisticated metal coins made of bronze, silver, and/or gold. As civilization and the global economy system advanced, mankind invented even more convenient forms of money: paper money, credit/debit card, contactless payment card, and even various digital forms of money.

Money in the 4.0 World

Blockchain as the future medium

Today, we live in a world of unprecedented change and innovation. For the last 20 years, the rise of distributed computing network called the internet has enabled billions of humans to connect and share information instantly and securely, with zero consumer cost. The benefit is immense and immeasurable. For example, the internet has enabled people from developing countries, such as Indonesia, to access high quality educational

materials such as Software Engineering Videos on Youtube and Free online courses from Stanford University.

In the last 2 - 3 years, we have seen the rising adoption of QR Code-based payment systems in Indonesia. These payment systems are operated by digital wallet providers as Go-Pay and OVO. While these services bring tremendous convenience for Indonesians to transact locally, there are two weaknesses of this approach. First, all of the balance records and financial transactions that ever happened on these platforms are stored in a centralized entity, meaning that a sophisticated, malicious attacker could potentially infiltrate and manipulate those balances and transactions. Secondly, as closed platforms, the money stored at any service provider can only be used by users and merchants within the system, which prevents important use cases such as cross application settlement, cross-border remittances, and international transactions.

We believe that distributed ledger technology, or blockchain, will bring the next step in the evolution of money. Just as the internet allowed for borderless and instantaneous movement of information, blockchain technology will allow us to exchange value and transact with one another in the same way: instantly, globally, securely and at low cost.

Digital assets such as Bitcoin is too volatile

We have seen that throughout history, money can take various forms and shapes. Every asset class that can act as money needs to fulfill three main functions:

1. as a means of exchange
2. as a standard unit of account
3. as a stable store of value

The Bitcoin boom and bust in 2017 - 2018 period have shown us that the prices of non-collateralized crypto assets are notoriously volatile. Even today, we believe that for the foreseeable future, Bitcoin and similar crypto assets are likely to remain more volatile than well-managed national currencies or gold. Such volatility might be interesting for speculative investors and day traders, but it makes the asset unable to be a stable store of value. For money to exist in the blockchain, we need an alternative class of asset that can maintain a relatively stable value.

Designing Crypto that is suitable for Indonesians

Basics

RupiahToken (IDRT) is the first crypto-asset which price is intended to mimic the value of Indonesian Rupiah. IDRT is issued by PT Rupiah Token Indonesia, an Indonesian-based startup. As an ERC-20 token, IDRT combines the speed, security, transparency, and other desirable characteristics of the Ethereum Blockchain.

PT Rupiah Token might collaborate with third-party market makers or independent traders in cryptocurrency exchanges to help ensure IDRT trades at value close to Indonesian Rupiah. Branding and market education will also help in establishing market consensus among traders that the value of IDRT tracks Indonesian Rupiah. However, the ultimate price of Rupiah Token in each cryptocurrency exchanges will depend solely on market forces of supply and demand. Rupiah Token has no contractual obligation to perform buyback of IDRT from its holders and does not represent indebtedness or debenture to IDRT holders.

Benefits and Strengths of IDRT

- IDRT is built on the Ethereum blockchain, which gives it the inherent security and transaction immutability of Ethereum.

- IDRT follows ERC-20 token standard, which means it is very easy to integrate and inherently compatible with many existing Ethereum-based applications.

- All transactions are executed according to the rules of smart contract, which eliminates human error.

- The security of IDRT smart contract has been audited and verified by CertiK, a world-class Smart Contract Auditor. IDRT is ready to be listed for all exchanges around the world

Tradeoffs of IDRT

- As with all ERC-20 tokens, transaction confirmation follows the speed of Ethereum network (about 1 - 3 minutes). This is much faster than Bitcoin, but still slower than ideal user experience.

- As part of the Ethereum blockchain protocol, all transactions in the Ethereum network requires the transaction initiator to pay "gas" fees in the form of Ether (ETH), the native crypto-asset of the Ethereum blockchain. This "gas" cannot be paid in IDRT or any other ERC-20 tokens. However, this trade-off may one day be resolved with side chain/sharding technology, such as Plasma and Raiden Network.

- The gas fees required by the Ethereum blockchain network varies depending on the load / congestion of the network. As a rough estimate, typical transfer costs around 0.0005 ETH, which is $0.07 USD or 1000 Indonesian Rupiah at the time of writing.

Use-case: Crypto-currency Trading

As with all ERC-20 tokens, IDRT usage requires at least a basic familiarity of using Ethereum. Users need to at least know how to use an ERC-20 compatible Ethereum wallet, and hold at least a very small amount of ETH to transact IDRT. Because of that knowledge barrier, the ideal adopters of IDRT would be existing players in the crypto-asset industry.

The main purpose of IDRT is to facilitate crypto-asset trading. Indonesian crypto traders need to exchange their volatile digital assets to crypto with a better price stability. With IDRT, Indonesian traders now have the option to convert their volatile crypto into a more stable token (IDRT) with respect to Indonesian Rupiah. Not only that, if IDRT is accepted or listed in multiple exchanges, Indonesian traders can trade between exchanges

Beyond cryptocurrency trading, there is chance that IDRT will enable a new class of exciting applications from the developer community. We open source our code to allow developers to create new and exciting projects that can integrate easily with IDRT. Developing a common standard in an open way will spur developers to work with code that is not controlled by any one party, and in the process raising the standard of security and diversity of developers/ applications being built with it. While we may not know what kind of application may emerge, we believe IDRT can be used in future Ethereum-based applications that wants to target Indonesian market as users.

Transparency and trust remains the core offering of the blockchain from day one.
We believe a future where existing financial players, blockchain native projects, and government agencies can coexist to foster an open financial system that support frictionless and safe transfer of value, both for consumers and businesses.

Detailed Technology and Operations

Ethereum and ERC-20 Token Standard

Ethereum is a decentralized blockchain that allows software programs, called Smart Contracts, to be written and executed on the blockchain. ERC-20 is a standard on the Ethereum blockchain that defines a common list of rules that all Ethereum tokens must adhere to.

We will not attempt to explain the entire Ethereum and ERC-20 Token standard on this paper because such discourse will be too long. Instead, we invite readers to read some of the following resources to learn more:

1. https://github.com/ethereumbook/ethereumbook
2. https://github.com/ethereum/wiki/wiki/White-Paper#notes
3. https://github.com/ethereum/EIPs/blob/master/EIPS/eip-20.md

Security of IDRT Tokens and Smart Contract

Ethereum Blockchain is tamper-proof

Similar to Bitcoin, past transactions in Ethereum are final and can never be altered. As of this writing, there are currently around 8,000 Ethereum nodes running worldwide. To "hack" and alter data / state in the Ethereum network, a malicious actor need to have more than 51% of the computing power of those nodes, which is highly improbable.

Ownership of IDRT Tokens are directly in users' hands

Unlike traditional e-wallet applications where the issuer holds the balance of each users inside the issuer's centralized system, we do not hold custody of users' IDRT tokens. IDRT tokens are owned by users in their own wallets, because users will control their own private keys (the 'password' that signifies ownership of assets on blockchain).

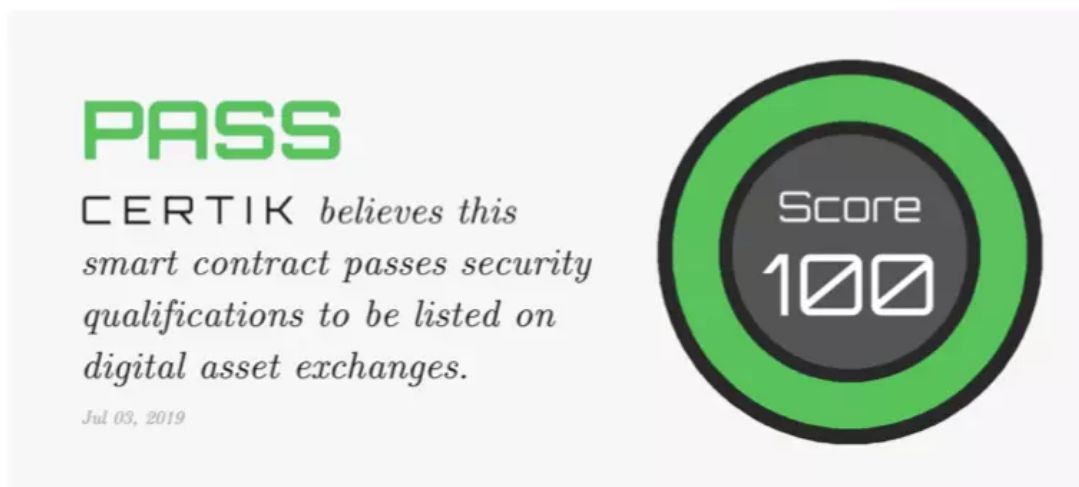## IDRT Smart Contract has passed CertiK Audit

Security is always on the top of our minds, and our Smart Contract has been audited by CertiK (https://certik.org/) to be secure.

Multi-signature design reduces single point of failure

We only hire the best, trustworthy people, and we believe there are no malicious actor(s) inside our company. However, we believe we still need to mitigate risk and ensure the

security of our internal operations by not allowing a single point of failure to exist. This is achieved using multi-sig smart contract design. During IDRT smart contract deployment to Ethereum blockchain, we established one address as the **Owner** and three addresses as Administrator. These addresses are each controlled by separate hardware wallets. Any critical operations require at least two signatures, as follows:

1. Two signatures are required for minting up to 100 million IDRT
2. Two signatures are required to burn IDRT tokens at a pre-defined burn address (i.e. we cannot burn tokens located outside of that specific address)
3. Two of three admins PLUS owner signatures are required for :
   1. Minting above 100 million IDRT in a single transaction.
   2. Transferring the token management of the IDRT ERC20.
   3. Replace, add, or remove an admin.

Signature of transactions happen in an offline, air-gapped computer

To enhance the security of IDRT operations even further, all transactions that interact with IDRT smart contract (such as minting, burning, etc) are done in an offline, air-gapped computer. We then use a separate device to broadcast/transmit the signed transaction to the Ethereum blockchain. As such, the computer used to compose the signed transactions are safe from external attacks.

Our Team

We, PT Rupiah Token Indonesia (https://rupiahtoken.com), are a team of Indonesian professionals who are incredibly passionate about driving positive change in Indonesia. We believe that Blockchain has the power to improve financial inclusivity and eradicate the difficulty of sending funds between parties globally.

We have a solid team who is composed of alumni from notable schools such as Harvard Business School, Cornell University, University of Texas at Austin, and world-class companies such as Consensys, Citibank, Traveloka, and Tokopedia, led by Jeth Soetoyo who has many experiences in Blockchain Technology.

Jeth Soetoyo - CEO & Founder

HBS | Ex-Consensys Product Lead

Jeth Soetoyo is a Harvard Business School alumni and the Founder & CEO of PT Rupiah Token Indonesia. Jeth had previously worked at ConsenSys, a Brooklyn-based Blockchain venture lab and solutions company. There, Jeth led product development of a cross-chain atomic swap solution called Liquality, which allowed participants to trustfully swap digital assets without intermediation. He had also conducted research with the MIT Digital Currency Initiative on crypto assets valuations.

Anthony Thio - CPO & COO

UT Austin | Ex - Traveloka Product Lead
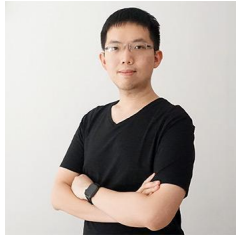
Anthony Thio is the Chief Product & Operations Officer of PT Rupiah Token Indonesia. Before joining PT Rupiah Token Indonesia, he previously served as Product Lead in Traveloka, launching and managing two successful products ("International Data" and "Bills & Top-up") for millions of users. He had also helped Dana Cita, a Y Combinator-backed fintech startup. He is deeply fascinated with blockchain, and is currently exploring Solidity.

Purwoko – VP Engineering

ITB 2010 | Ex-Traveloka Engineering Lead

 Purwoko is a seasoned backend engineer with extensive experience working in the tech industry. Prior to joining Rupiah Token, Purwoko spent 4.5 years as backend engineer in Traveloka, working in many different products such as Flight, Hotel, Bill Payment, and International Data. He currently helps Rupiah Token architecturing backend systems and developing new products.

Evan Leonardi - VP Engineering

BINUS | Ex - Qbit CTO
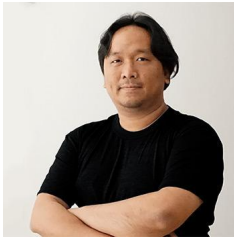
Evan leads the Engineering division of PT Rupiah Token Indonesia . He has a deep experience of 11+ years in the IT / Software Development Industry. During his career, Evan established himself as an IT and R&D specialist in mobile application and server development. Before joining PT Rupiah Token Indonesia, Evan was conducting deep research on Blockchain applications and implementing Blockchain projects in Finance Industry.

Fengkie Junis - Smart Contract Engineer

UNIVERSITAS GADJAH MADA

Fengkie leads the smart contract development of PT Rupiah Token Indonesia. He is very proficient at Solidity, and his Smart Contracts passed CertiK's high audit standard, ensuring the security of our Token. He has previously researched about using blockchain to track Stamp Duty payment. His undergraduate thesis explores ways to create a Blockchain-based Digital Art Registry using Ethereum ERC-1155 Token Standard and Smart Contracts.

Investors & Advisors

Brian Limiardi - Ex - Goldman Sachs, Asani

UIUC | YALE MBA

Brian believes blockchain technology will revolutionize banking. He worked as FX trading programmer at Goldman Sachs before moving back to Indonesia to take a management position at a publicly-listed technology company. Most recently he has founded Asani. Brian earned his Computer Engineering degree with high honors from The University of Illinois, and completed an MBA from Yale University in 2018

Andrew Adjiputro - VP of Northstar Group

CORNELL UNIVERSITY

Andrew spent most of his career in the Finance industry after graduating from Cornell University in 2010. He started his career in Investment Banking at Citibank, before moving into Private Equity at Northstar, where he is currently a VP

Lawrence Samantha - CEO of Honest Mining

OHIO STATE UNIVERSITY

Lawrence is an engineer at heart who loves technology & venture building. He has been working on cryptocurrency mining since 2011, and he founded Honest Mining in 2018. Lawrence's computer science expertise has led him to work on multiple companies such as Nationwide Financial (210 Billion managed Assets) & Bittorrent, Inc (decentralized peer-to-peer network, later acquired by TRON). He also co-founded among others eEvent, guestHub, Loket.com, Member.ID, Indosystem, and BitHarga. Lawrence graduated from The Ohio State University and holds a Computer Science & Engineering degree. He has over 12 years of professional development experience.

Conclusion

We have presented and built the first crypto asset that mimics the Indonesian Rupiah. By leveraging the Ethereum network and advanced Smart Contract designs (such as multisignature requirements and offline signing), IDRT can act as a stable store of value for Indonesians to be used in the exciting new era of blockchain-based economy.

DISCLAIMER

This whitepaper may be revised from time to time without any notice as the project progresses. We will publish any future versions and updates on our website, https://rupiahtoken.com. We only have a single website, and are in no way affiliated with other potentially similar-sounding sites.

References:

- https://github.com/ethereum/wiki/wiki/White-Paper#notes
- https://github.com/ethereum/EIPs/blob/master/EIPS/eip-20.md
- https://github.com/ethereumbook/ethereumbook