KANALOA
NETWORK

Whitepaper

1.1 Abstract

Two glaring obstacles present today in Decentralised Finance are its lack of adaptability to the ever-changing landscape of needs, and the high learning curve it demands of new participants. The intricate tools and mechanics currently offered, though innovative, cannot yet conform to new and changing market and regulatory conditions, as they often focus on only one specific temporary need or function. We believe that for DeFi to realise its full potential and become a viable alternative to traditional, financial instruments, these instances must be improved upon.

Kanaloa Network aims to become the primary entry point for new market participants, entrepreneurs, and private and institutional investors. Kanaloa Network delivers on the promise of accessibility, adaptability, and comprehensiveness for all its participants through offering two major components not yet available in the space i.e. Accessibility and adaptability.

Kanaloa's simple-to-use Diamond-Token Generator offers a never seen moldability to the projects generated, giving its participants a range of new features to choose from and to deploy with a few clicks of a button. This process eliminates the need for an intricate understanding of blockchain programming or expensive outsourcing to 3rd party developers. Simultaneously, the usage of the ERC-2535 standard allows projects to transform alongside the evolving DeFi landscape on the fly.

Kanaloa's Contract Validation Toolkit will enable users to research projects of interest and validate contracts existing in the market today. This toolkit will allow everyday users to verify the integrity of existing contracts on the market with an easy-to-understand UI and functionality. The CVT will employ a rating system based on a system of metrics, and distribute a score for each project accordingly. This will give users the ability to "see behind the curtain" for any potentially malicious code or structure, and deliver better decision-making opportunities regarding investment.

1.2 Introduction

Supported by a strong foundation of use-cases and a self-sustaining ecosystem, the Kanaloa network offers master keys to the technical doorways presented these days, in the realm of DeFi. The goal is to unlock the full potential of the ERC-2535 standard, and build a self-sustaining network on a trustful basis via implementing "proof of commitment" mechanics by ERC-1155 "NFT keys". The Kanaloa network will offer its participants a fully decoupled, decentralised and adaptable portal to the DeFi landscape in the future.

The new standard brings a new dawn of Smart contracts.

With the development of the EIP-2535 standard by Nick Mudge, a new dawn has risen over the DeFi landscape, and the Kanaloa Network is developing the product palette to provide easy-to-use tools for mass adoption by the end consumer. With the EIP-2535 Diamond Contract with the creator tool at its centre, the Kanaloa Network products will become the one-stop shop for all tokenization and smart-contract needs!

Projected growth areas

Institutional tokenization of products and projects:

- Driven by entities, looking for entry points into the burgeoning sector
- Regulations allowing a broader usage of synthesised or tokenized assets and goods like intellectual property
- The need for decentralised and democratic control of their operations
- The demand for adaptable contracts and products to stay competitive in the rapidly changing space
- Inability to outsource substantial parts of operations into the possible tokenization of their products and assets.

Private and retail adoption of tokenization and tokenized goods:

- Simplified access and validation of potential investment vehicles
- Simplified access to tokenized intellectual property and assets
- Passive income vehicles
- Wholistic interest in synthetic and digital assets and services

The Entry-barrier Problem:

The major obstacle in the way of mass adoption and broad usage of DeFi products lies in the highly technical barrier the space presents to entering it. New market participants are required to invest a substantial amount of time and resources into researching the space, eg. its functions and the potential danger it can present to their product or investment.

For institutional investors, like smallest to medium-sized companies (representing 90% of worldwide companies and employing 50% of the worldwide workforce presently), outsourcing this to a qualified expert is not feasible. Hiring an in-house specialist presents an even bigger financial commitment for such a venture. Assuming these limitations, the DeFi sector closes itself off to a major part of potential market participants worldwide and makes entry into the Industry, which is a difficult and cost intense project for both start-ups and established companies alike.

The adaptability Problem:

With market conditions and regulations changing daily, retail and institutional investors in the DeFi space are presented with an increasing need for adaptability of their investment vehicles, and products alike. Classical ERC-20 contracts do not lend themselves to flexibility on a trustless basis. Facing the market participants with a dilemma of having a stiff investment vehicle in a rapidly changing environment, or the need for a trust-based open contract system leaves it vulnerable to the same human errors and manipulation the classical financial tools present. As a result, a substantial number of institutional and retail investors, interested and bound to regulatory compliance and unadaptable products, remain closed off to the market. With the world changing even faster, the Blockchain industry is faced with a need for modular, flexible and adaptable products more now than ever, to not close itself off from the rest of the economical systems surrounding it.

1.3 Contribution

The Kanaloa network, with its utility token KANA at its core and the variety of tools provided to its participants, aims to contribute to the accessibility and security of users of the complete DeFi space on a global scale. Participating in the network will enable all parties involved to a trust-worthy, commitment-based entry point to the decentralised financing and the tokenization of your assets. Utilising the ERC-1155 standard for this, allows an unprecedented system of keys to access the benefits generated by the network. This standard and the implemented distribution plan secure the commitment of the participants while, simultaneously, allowing for a simplified delegation of rights and powers to other participants.

With this network configuration and the simple access to highly flexible EIP-2535 contracts, Kanaloa introduces a completely new set of adaptable and modular contracts to the space, enabling the usage and cost-efficient elimination of the technical barrier for all new market participants.

With the EIP-2535 standard, network participants can produce and deploy contracts and products which can adapt to the changing market conditions and regulations with ease. Simultaneously, using the untapped potential of interest-generating ERC-1155 tokens to reward committed network participants, thereby, generates a trustworthy, simple to delegate and still highly liquid governance system. These two key factors enable Kanaloa Network users and partners a clear strategic market advantage.

The EIP-2535, utilised by the Kanaloa Network, brings with it a unique set of possibilities for users, including the following, but not limited to:

- A stable contract address that provides the needed functionality.
- A single address with the functionality of multiple contracts (facets) that are independent of each other but can share internal functions, libraries and state variables.
- A way to add, replace and remove multiple external functions atomically (in the same transaction).
- Fine-grained upgrades, so you can change just the parts of a diamond that need to be changed.
- Have greater control over when and what functions exist.
- Decentralised Autonomous Organisations (DAOs) and other governance systems can be used to upgrade diamonds.
- An event that shows what functions are added, replaced and removed.
- The ability to show all the changes made to a diamond.
- A way to look at a diamond is to see its current facets and functions.
- Have an immutable, trustworthy diamond.
- Solves the 24KB maximum contract size limitation. Diamonds can be any size.
- Larger contracts have to reduce their size by removing error messages and other things. However, you can keep your error messages and the full functionality that you need by implementing a diamond.
- Enables zero, partial or full diamond immutability as desired, and when desired.
- Develop incrementally and let your diamond grow with your application.
- Upgrade diamonds to fix bugs, add functionality and implement new standards.
- Organise your code with a diamond and facets.
- Diamonds can be large (have many functions) but still be modular because they are compartmented with facets.
- Contract architects that call multiple contracts in a single transaction can save gas by condensing those contracts into a single diamond and accessing state variables directly.
- Save gas by creating external functions for specific use cases, such as bulk transfers.

With this barrier-breaking technology as its backbone, the Kanaloa Network provides and develops a set of tools that allow user-friendly, unprecedented flexibility in creating smart contracts. With its ever-growing catalogue of prepared and vested modules, the Kanaloa Network allows its users to create smart contracts and tokenize their assets safely and cost-effectively, without the need to spend vast resources and time on their development.

In addition to the prepared modules, the Kanaloa Network also offers the development of custom modules to fit the needs of your project, combined with the ability to personalise your contract at any point. The Kanaloa Network can offer a unique, broad and easy application of the Network and tools for all levels of Coding capabilities.

Kanaloa Network:

With the Diamond Token Generator at its core, the Kanaloa Network is providing a safe and easy-to-use platform for all tokenisation plans. Regular users will be able to get custom modules to fit their client's needs, allowing for a simple one-stop-shop experience for the parties involved. The Platform is constantly growing by adding other tokenization services, like an NFT creator as well as a validator kit to check for critical coding errors in all variations of smart contracts. By working closely with reputable third-party validators and auditors, the Kanaloa Network only integrates modules available to the public that uphold the highest security and coding standards, thereby, allowing the Network to validate the diamond contracts created quickly and safely.

Based on a 4 phase development schedule, the Kanaloa Network will develop into a fast and secure tokenization platform.
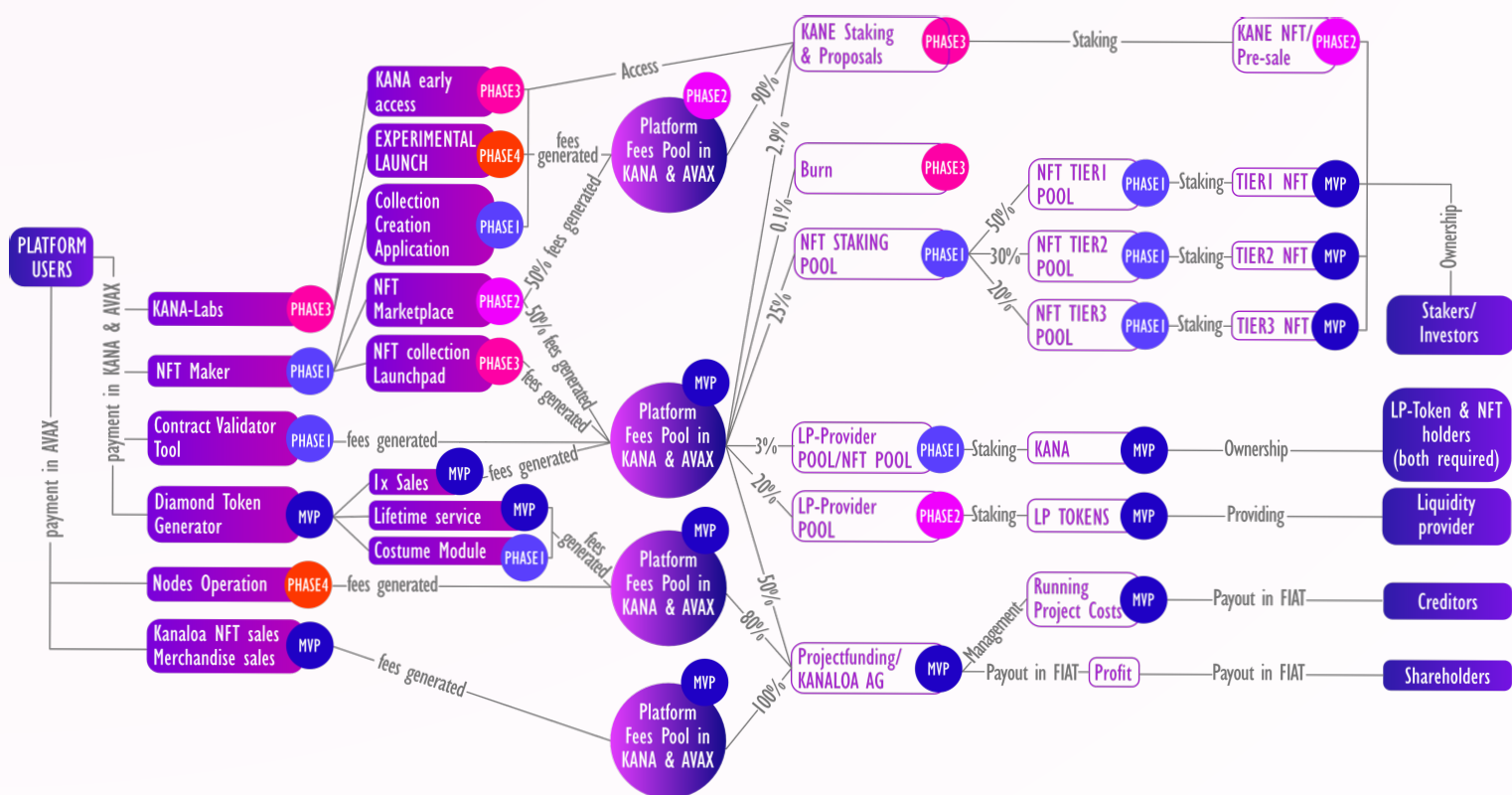
Why use the Kanaloa Network?

With its unique product pallet the Kanaloa Network offers an unprecedented tokenization software consisting of the following:

Technical overview

Kanaloa Network aims to provide an easy-to-use on-chain development experience for both newcomers to the space, who may want to set up a project without programming knowledge, and for veterans, who want to spend less time reinventing the wheel with boilerplate code and more time-solving problems. To that end, we leverage the usage of EIP-2535 (Mudge, 2020) with our custom implementation (and extension) of the standard: the Refraction Engine.

Refraction Proxies and Refraction Engine

The heart and soul of our technology rely on the above-mentioned two components. Refraction Proxies are transparent proxies that contract with little logic and dependencies (the only dependency is the storage slot and structure of the basic Refraction Engine), used only to hold the state of the contract deployed by the user. Since it is only a few bytes long, the deployment of a Refraction Proxy is much cheaper than that of its non-diamond counterparts (calculated to be roughly around 90% cheaper in terms of gas for a regular ERC20 contract, according to internal tests) while still retaining all of the functionality of a traditional contract. This is the reward of reusing the previously deployed facet modules, which hold all the logic required for the smart contract to operate i.e. the Refraction Proxy scans its internal registry for the address of the smart contract containing the logic of the called function, and then delegates the execution via the DELEGATECALL EVM opcode to the bytecode contained in the foreign contract, while keeping the state environment of the Refraction Proxy.

The Refraction Engine, on the other hand, is our reinterpretation and implementation of the EIP-2535 ABI (backwards compatible with the appropriate compatibility facet module, installed by default). Our unique addition, however, is the concept of self-installable modules, or "facet modules": instead of relying on the developer to correctly set up every method in the proxy's jump table by hand, these modules are capable of injecting into the table the methods they implement, and even perform an initial setup in case they require to do so. The system is so simple and flexible that this is the mechanism by which the Refraction Engine instals the necessary methods for its operation during the deployment of the proxy automagically.

Project-oriented development

Despite their extremely modular nature, diamonds can not contain everything a project may need in a single contract, the simplest example being the need for more than one ERC20 token in places where ERC1155 is not well supported. To further reduce the development friction while using Kanaloa Network's control panel, families of contracts can be grouped under a single project, where they can share settings such as administrators or bridging parameters. Consider them like a folder of smart contracts from which administrators can adjust everything about their product in a single place.

Reproducible, secure deployments

Contracts using Kanaloa Network are deployed through a specific factory setup that allows every project to share the same address across all chains that support the Ethereum address format, as long as the target chain supports the CREATE2 EVM opcode. In addition, after arbitrary call data integration with bridges such as Elk Finance's bridge or Axelar Network, deploying an existing project to a different network could be initiated from the source chain and later completed in the target chain by our bridge modules. The state schema can then be synchronised in the target chain by replaying the history of module installs of every contract in the project.

In addition, since the Refraction Proxy is so minimal, updates to the used facet modules or the Refraction Engine will not change the address of the resulting contracts, as the address is determined by the name of the project, the code of the contract and the constructor parameters. Even though the Refraction Engine implementation address is sent to the contract as a constructor parameter, a beacon can be used to always keep the same address for its installation, regardless of the actual version of the underlying implementation.

All these deployments go through our own KanaloaDeployer, a smart contract that ensures that every single contract launched through our platform does exactly what's on the tin. Injection of arbitrary code is not possible while in "managed mode", where our Kanaloa Admin contract holds the root permissions for the maintenance of every contract. Contracts under "managed mode" will only allow specific, well-known, white-listed modules to be installed in the contract with sanity-checked parameters, which ensures that there can always be some sort of "seal of approval" on every contract still operating under "managed mode". This guarantees that the contract can have full traceability of its assembly process. Project administrators can opt out of "managed mode" at any time, and essentially acquire 7 full control of every aspect of their contracts, including the ability to install arbitrary modules, but this action cannot be undone, and the traceability of its installed modules and introduced parameters can no longer be tracked by the network.

Facet Modules

In addition to the Refraction Engine being one of them, the ease of use of Kanaloa Network relies on the usage of different facet modules to control the capabilities of every smart contract. These facet modules can be as easily and automatically installed onto any of the contracts generated with our platform as you would install a program on your computer. Every facet module installable through our interfaces includes a wizard that will guide you through every step required to configure the module before it is ready to go.

The following is a non-extensive, ever-expanding list of the modules you will be able to install in your Kanaloa Network contracts. This list will be updated as new modules are developed and released through the Kanaloa Labs initiative.

ERC20 Module
Installing this module in a contract will allow it to act as an ERC20 token, the most well-known and supported standard across the entire Web3 landscape. Parameters allow users to customise the token's name, ticker, supply mode (fixed or variable), and total and maximum supplies.

Mint/burn Module

A module that depends on ERC20 with variable supplies allows whitelisted addresses to mint and/or burn tokens to/from their accounts, as long as the total supply still stays in the range established by the supply parameters of the ERC20 module. It can be used in tandem with a MasterChef contract or module to provide an inflation mechanism.

Rebase Module

It is also known as the "reflection module" since both of them operate under the same principle. It allows a contract to introduce a "base" parameter which multiplies the holdings of every holder by a given factor. This, for example, allows project administrators to set up a transaction tax that modifies the "base" parameter after every transfer, essentially redistributing that fee to every holder of the token (also known as "reflection" after $RFI, which has popularised the concept).

NFT- Creator and Marketplace Modules

ERC721 Module

Installing this module in a contract will allow it to act as an ERC721 token, otherwise known as "an NFT". In addition to the usual name, ticker and supply, project managers may set up the base URI to access the token's metadata.

Mint Module

Project managers can set up a custom minting schema for their NFT collection, including features such as pay-per-mint, address whitelisting, and special URI mapping modes.

ERC1155 Module

Installing this module in a contract will allow it to act as an ERC1155 token collection. It is the perfect blend of ERC20 and ERC721, combined in a single contract, which allows users to own several different assets represented by the same underlying smart contract. While not fully supported by many platforms and tools yet, we will make all of our ecosystems compatible with the standard.

Governance and Control Modules

Tokenized Access Control (TAC) Module

Installed by default on every project, this module allows project managers to mint roles and permissions to operate their contracts' privileged functions as NFT. These NFTs can be transferred to other accounts or even smart contracts, allowing administrators to delegate the maintenance of certain functions by DAO or multi-signature contracts. In "managed mode", the root control token is owned by the KanaloaAdmin contract, which prevents the injection of unauthorised modules or illegal parameters.

Bridge Module

Installing this module in a contract will allow it to make cross-chain calls to foreign chains via the use of our partner bridges. This can enable, for example, transfers of tokens between two different chains. Extra rates may apply depending on the underlying bridge used for the transfer.

KANA Tokenomics

2.1-KANA Tokenomics:

Total suply	1 000 000 000 KANA
Circulating supply initial	460 000 000 KANA
Innitial liquidity	100 000 000 KANA
SEED sale	100 000 000 KANA
PUBLIC pre-sale	150 000 000 KANA
Airdrop & Farms BNB Holders	50 000 000 KANA
Development Fund	250 000 000 KANA
Liquidity reserves	250 000 000 KANA
Team	100 000 000 KANA

SALE	PRICE	TARGET
SEED SALE	0.0080	1 100 000 USD
PRE SALE (IDO)	0.0110	1 440 000 USD
DEX LAUNCH LIQUIDITY	0.0110	1 100 000 USD

Vesting Schedule:

TEAM ALLOCATION	4% on month 12, 4% per month for 24 months
SEED SALE	4% on month 12, 4% per month for 24 months
PRE SALE	50% at TGE, 10% per month for 5 months
AIRDROP	50% at TGE, 10% per month for 5 months
INITIAL LIQUIDITY	100% at TGE
MARKETING/DEVELOPMENT	4% on month 1, 4% per month for 24 months
CROSS - CHAIN FUNDS	100% at TGE
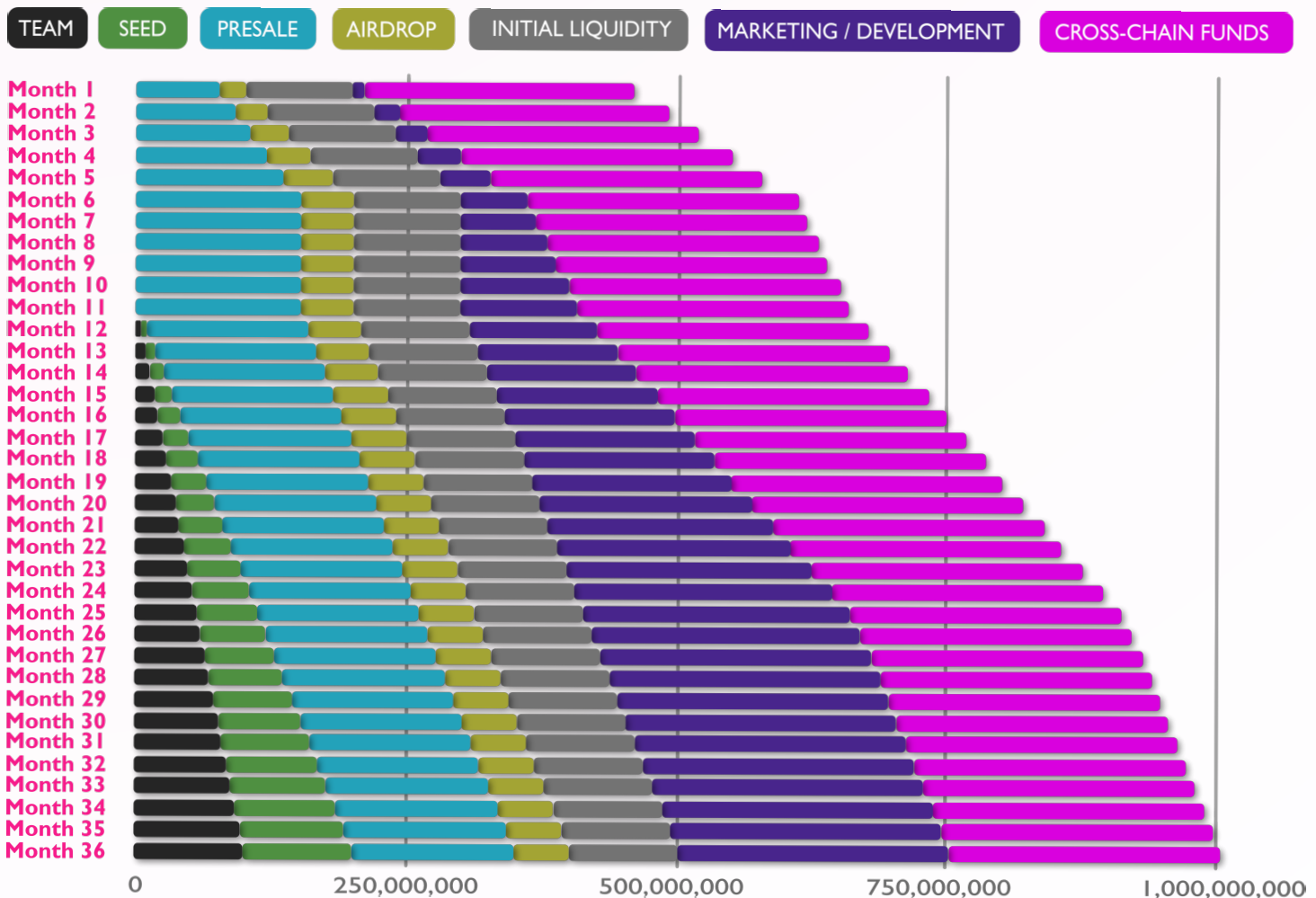
3.4-NFT

3.4.1 Kanaloa NFTs
Using the in-advance distributed ERC-1155 NFT Network Keys, Network-users can access different profit-share pools within the staking network of Kanaloa. With these interest-bearing NFTs, the network secures a healthy redistribution of the profit shares to all participants. Users will be able to use, collect, trade and create Network NFTs for all distribution pools.

Holders of the KANE Network NFTs focus on the NFT-Creator and Marketplace aspects of the Network, allowing holders to participate in the Marketplace-related profit-share pools, and to help them receive exclusively, the secondary token "KANE", propose additions of Modules, and as well as interact with the Marketplace itself. This creates the perfect Key for invested Network members and creative parties.

3.4.2 Kanaloa Collectibles
The Kanaloa Network will release a set of collectible ERC-721 & highly limited ERC-1155 art sets granting access to special auctions to be held on the NFT platform. These special collectables will be part of an auction process to be announced. The Kanaloa Network aims to work with a set of established artists for these pieces, creating a special blend of access key and fine art, for appreciating collectors and investors alike. All shares received by the network from these auctions will be used according to the graphic displayed under 2.1.

Future growth

Extension of the generator's capability:
The implementation of the ERC-2535 standard provides Kanaloas products and networks with unprecedented modularity. This flexibility grants the Kanaloa development team the ability to add or remove an unlimited number of features to products and the network.

This moldability will ensure that Kanaloa's innovations are on the cusp of blockchain and decentralised finance evolution and secure a competitive market position in an ever-changing landscape. Using the EIP-2535 standard with key features securing steady growth in services offered by the Network has some capabilities unique to the Diamond Contracts i.e.:

- Increase trust over time by showing all the changes made to a diamond.
- Separate functionality can be implemented in separate facets and used together in a diamond.
- The ability to develop and improve an application over time with an upgradeable diamond and then make it immutable and trustful if desired.
- Save gas by creating external functions for specific use cases, such as bulk transfers.

Interoperability through multi-chain compatibility:
Kanaloa will extend the compatibility of its token and products to include a multitude of blockchains to maximise market reach and harvest growth amongst the ecosystem.

Further growth through a flourishing secondary NFT market:
With the ERC-1155 and ERC-721 tokens (NFT) as an intricate part of the network governance and reward privileges, Kanaloa is creating a secondary market for highly scarce, interest-yielding, and privilege-granting NFTs of the network. These factors will play a vital role in distinguishing Kanaloa Network from its competitors.

Growth of the network through long-lasting partnerships:
To become the premier platform for new DeFi projects and products worldwide, Kanaloa will partner with several existing projects within the DeFi space. Partnerships will be formed to extend the capability and security of the network and its products and will aim to provide a multitude of verified partner products to be implemented into the expanding network.

Kanaloa Roadmap

PHASE 0

Phase 0 is all about laying the foundation for the Kanaloa network. The first step is building a community, which means reaching out to potential users and partners to get them excited about the project. This is followed by onboarding first partners, establishing relationships and partnerships with key players in the DeFi space. Incorporation of the project is the next step, which involves legally registering the Kanaloa network as a company in Switzerland. After that, a test version of the Diamond Token Generator is released for testing and analysis, and to evaluate and analyse the performance of the testnet version of the Kanaloa network.

Modules developed in Phase 0:

- **Basic TAC:** a Tokenized Access Control module that provides permission management functionality.

PHASE 1

Phase 1 is all about development and business. On the development side, we will audit the testnet version of the Kanaloa Diamond Token Generator to ensure its security and functionality. We will also demonstrate the upgradeability of the network by showcasing its ability to implement new features and modules. In addition, 6 key modules will be developed and released, being these the foundation of the Kanaloa Network. On the business side, we intend to fundraise through a seed financing round targeted at institutional investors, launch a public round of fundraising for the KANA token using the Avalanche network, establish relationships and partnerships with other projects and companies in the DeFi space, bring on experienced advisors to assist with the growth and development of the Kanaloa network and expand the team behind the Kanaloa network.

Modules developed in Phase 1:

- **R&D on Decentralized storage:** research and development on decentralized mass storage systems, such as ArWeave.

- **Decentralized storage services brokerage:** a service that brokers and provides intermediary services for decentralized storage systems.

- **Legalese module:** a contract storage/license module that enables tokenization of assets such as stocks, equities, and housing.

- **POC Royalty enforcement for NFT:** a proof-of-concept module that implements royalty enforcement for non-fungible tokens, as opposed to the current "gentleman's agreement" standard.

- **Reflection Module:** a module that provides the base reflection function.

- **Mint/Burn Module:** a module that allows for flexible supply options and regular or event-driven minting and burning of tokens.

- **R&D on Reproducible deployments**: a tool for reproducing Kanaloa deployments on different chains.

- **Deploy on a chain of your choosing BNB, AVAX or ETH:** a module that enables deployment on target chains such as ETH, AVAX, and BNB.

- **Tokenizable baskets:** a module that allows for the creation of custom indexes

PHASE 2

For Phase 2, the main version of the Kanaloa network will have been released on 3 major blockchains including the 6 base modules. Additional modules will be developed and released for the network to enable KANA token holders to earn additional tokens through staking. On the business side, we will continue to expand the team behind the Kanaloa network and extend the compatibility of the network to other blockchain platforms.

Modules developed in Phase 2:

- **Marketplace as a Service**: a module that enables building of a custom decentralized exchange or a Shopify clone.

- **Deploy on more Chains:** a module that allows deployment of tools on other blockchain networks.

- **Cross-chain deployment:** a module that allows deployment of tokens on multiple chains simultaneously and management via the TAC module.

- **Vendored KYC web of trust:** a module that enables identity verification by trustworthy notaries and use in places where they are trusted.

- **CEX Pipeline:** a module that enables getting on a short list to be considered by partner exchanges for launches and listings.

- **Liquidity manager:** a module that allows management of the project held LP between different pools with the help of oracles to minimise arbitrage and slippage losses due to different liquidity pools running simultaneously.

Strategy explanation

PHASE 1

Goal:

During the start-up phase of the project the hiring and onboarding of internal and external staff is kept to a minimum to keep costs low and efficiency and communication high.Most of the workload in this phase is to be done by the founders of the project. The external forces hired during this phase include a front end developer as well as a website designer, these were added to secure an industry conforme public appearance during this phase and the funding period.

Focus:

The absolut focus of the workload during this phase took up the development of the product at the proof-of-concept version. The Main Business focus lies in securing the funding necessary to further develop the product and incorporate the project in Switzerland.

PHASE 2 (READY TO MARKET):

Goal:

Development:
During this the goal is to get a competitive and well audited product ready to go to market within the committed time frame. The product will hold 6 core modules and functions that will be released at launch, including the fully functioning upgrade and downgrade tools as well as the corresponding app designs.

Business operations:
After a successful incorporation in Switzerland the main target of business operations lies in securing the necessary funding to develop the product according to the development and release strategy. Next to securing the funding, business operations will start onboarding the board of advisors to secure the best possible position for Kanaloa at launch, as well as the necessary partners to ensure a safe and secure launch on the Avalanche chain during the initial release at the end of the phase according to the roadmap.

Focus:

Development:
The focus of the development team will lie in securing a safe and solid product. To ensure a lean and fast channel of communication with all departments as well as as part of a conservative risk strategy, around 70% of the total development workload is to be covered 21 by externally hired development teams. In perspective of the security, all testing and technical audits, all of the workload will be given to external partners during this phase.

Business operations:
Focus of the business operations team will lie on securing the necessary funding and keeping internal costs down. As part of this strategy all legal concerns, tax concerns and contractual concerns will be given to established external experts. This will include a trustee, a swiss law expert, an international crypto legal expert, a financial auditor as well as a team of marketing strategists, focused on securing an optimal public launch of the product at the end of phase two. The according market communication strategy will be approved and budgeted by the internal team of funders.

PHASE 3 (PRODUCT AND SERVICE EXPANSION):

Goal:

Development:
During this phase the development team will work on the creation of further vital modules to expand the service capability of the platform significantly. During this phase the internal team will grow and switch from having mostly external inputs to establishing a strong base for an ongoing production line of modules during this and later phases.

Business operations:
Main goal of business operations is the expansion of reach toward the US and Asian markets, as well as securing a solid recurring client base for the plattform. To allow these developments to take place the business operations will also establish a full time team for the daily business as well as client acquisition and partner management.

Focus:

Development:
The focus of the development team during this phase will lie in the development of highly competitive modules for the plattform, as well as improving the existing modules to fit the new market parameters according to the external audits.

Business operations:
To reach the mentioned goals the establishment of an internal full time team will have the main focus, this will allow the funders to focus on onboarding the necessary advisor teams to ensure a secure and successful launch in both target markets