BlockCrafters

Project Report

Group 4

Alan Song-Hong Lee, Boru Zhu, Jiapei Yu, Sara Zhang, Yixin Zhang

Executive Summary

BlockCrafters is a Web3 decentralized crowdfunding platform that addresses major limitations in traditional startup fundraising. Existing systems often exclude retail investors due to high entry barriers and lack transparency in fund management. BlockCrafters leverages blockchain technology to create a more accessible, secure, and accountable investment ecosystem.

The platform allows startups to raise capital by issuing project-specific ERC20 tokens that serve as both proof of investment and voting rights. Smart contracts handle key processes such as project creation, milestone tracking, fund release, and governance. Funds are released incrementally, tied to milestone completion and validated through token-holder voting, ensuring responsible capital use.

On the frontend, BlockCrafters is built using Flutter to deliver a consistent user experience across web and mobile platforms. The interface integrates with Ethereum wallets and IPFS to support decentralized data storage and user authentication. Key user roles include investors, who contribute and vote, founders, who manage campaigns, and the platform owner, who oversees operations.

Future development will introduce platform-wide governance, token swapping, and dividend mechanisms, enhancing long-term sustainability and investor utility. With its modular smart contract architecture and intuitive frontend, BlockCrafters establishes a solid framework for a transparent and community-driven fundraising model.

Content

1. Introduction

The traditional process for startups to raise funding is often restrictive, favoring established investors and large financial groups. This makes it tough for individual investors to invest in new businesses. At the same time, startups can have a hard time getting funds. They face tricky legal rules, location limits, and extra costs from middlemen.

Our Web3 dApp, motivated by a desire to democratize crowdfunding applications, has the goal of causing a revolution in how startups can get funding and how individual investors can generate greater returns by utilizing their excess liquid funds. Our dApp issues tokenized proof of investment that confers voting rights and directly ties investors to project performance, providing a transparent, secure, and decentralized investment ecosystem for investing. This builds trust between startups and the people who invest.

Additionally, our built-in security mechanisms protect investor interests by requiring startups to retain a percentage of the raised tokens. These can go back to investors based on their initial investment proportion if the business fails. To ensure responsible fund usage, a smart contract escrow mechanism is implemented, which releases funds only upon milestone completion. This guarantees that startups achieve measurable progress before accessing the next tranche of funding, providing additional security for investors. Furthermore, startups can buy back their tokens after they hit certain revenue milestones. This lets them get control of their share of the company again.

1.1 Problem Statement and Motivation

Traditional venture capital models have several limitations which we aim to solve by our web 3 dApp. First, it is a significant issue that small investors have limited access to the traditional venture capital models, since the high minimum requirements and closed-network structure. Apart from that, the high intermediary and administrative costs even make the process not only more complicated but also expensive and inefficient. Additionally, transparency in investment agreements is often lacking, leading to increased risks for both investors and startups. Last but not the least, the other major concern is the protection of investors. Putting money into new

businesses is tricky and needs careful thought. It comes with big risks like possible scams or dealing with shell companies.

Our web3 dApp directly addresses these challenges by utilizing blockchain's transparency, immutability, and decentralization to create a fair and efficient fundraising platform, and we also require all new businesses to give us a full set of papers and details. This careful checking helps investors get a clear and full picture of how promising the new business is and if it's running. We want to make startup investment available to everyone by giving all investors, big and small, a chance to buy tokens in startup funding rounds. This makes raising money easier for startups by cutting out middlemen and letting them get money more easily. Each active project on our platform issues a unique token. These tokens serve a dual purpose—they prove investment and empower governance. The more tokens an investor holds, the greater their voting power. This structure ensures that decisions about milestone advancement and fund usage aren't made arbitrarily. Instead, they are guided by the collective voice of the community, with voting rights distributed proportionally. It's governance by stake, shaped through participation and aligned with real investment. We, as the platform, would keep 20% of the raised funds as the frozen capital that serves as protection to investors. We build trust by putting all investment deals on the blockchain, which cuts down on cheating and bad management. To keep investor money safe, our smart contracts give out funds bit by bit as startups reach goals. This stops startups from getting all the money too soon and makes sure they're making real progress before they can use all the funds.

1.2 Related Works

There are few existing platforms that have similar services as our web3 dApp but still have limitations which our application tries to solve. First is the crowdfunding platforms like Kickstarter and Indiegogo, which provide start-ups a way to raise money for their companies but most of them reward backers by offering products, giving early access to the service, or even exclusive merchandise. Kickstarter is a company which makes ideas into reality. It's where creators share new visions for creative work with the communities that will come together to fund them[1]. Kickstarter is mainly to raise money for creative works such as art, fashion, music and so on. In this case, they offer backers products or services in exchange for their support[2],

which is similar to Indiegogo they reward backers by gifts, products or personalized thank-you notes, rather than an equity stake in the company[3]. While DeFi protocols also bring in lending instruments, they primarily focus on lending rather than direct investment in startups.

Our decentralized application works towards creating a start-up investment platform since investing is limited to pooling in tokens to eliminate intermediaries and minimize the associated costs. We secure liquidity for investment by establishing a tokenized fundraising model using blockchain. Investment integrity has been enhanced by providing that, in case of any failure, relevant tokens raised in the startup will not be disposable for any stakes less than 10%. Unlike traditional platforms, our dApp inscribes the flow into good decision-making by equipping investors with freedom to assess and invest in whichever firm based on their evaluation results without adhering to minimum limits for investing as in common platforms. We also raise a token buyback option for a startup that allows the firm to repurchase certain tokens from investors based on certain revenue thresholds. This provides the firm greater control in managing its capital-raising strategies. Smart contract escrow guarantees that the funds will be released to the startup only upon proof of certain established milestones, thus preserving the interest of investors.

Using blockchain and tokenization, our dApp sets out a whole new paradigm in the startup funding space that is crisp, transparent, and hard to let down.

2. Market Fit

Our Web3 crowdfunding dApp primarily targets two key user groups. The first group is the **early-stage startups** that are seeking to bypass traditional, high-cost fundraising channels and overcome institutional barriers. They are innovative, agile, and often overlooked by conventional venture capital. Another group is the **retail investors**, ranging from small angel investors to enthusiasts who wish to participate in early-stage ventures. They stand to gain significantly, as they access investment opportunities previously reserved for well-funded entities. Early-stage and growth-stage startups often struggle with securing capital due to high entry barriers, geographical limitations, complex regulatory requirements, high transaction costs, lengthy due diligence processes and limited accessibility for individual investors in traditional funding methods. While modern crowdfunding platforms have made it easier for startups to raise funds, they usually operate on a "backer beware" model, where investors support projects without guarantees of refunds or protection against deceptions or failures. If a project fails, investors have no recourse to recover their investment, which discourages risk-averse investors from participating. Additionally, no mechanisms exist to verify whether funds are used as promised, creating uncertainty for investors. Traditional crowdfunding platforms often rely on rewards-based support—offering backers early access, exclusive products, or small perks. However, they fall short in granting any real stake in the project. There is no equity, no voting power, and certainly no long-term governance rights. This model treats supporters as passive consumers rather than active participants. As a result, the relationship between creators and contributors remains transactional, not collaborative—limiting trust, accountability, and sustained engagement.

Our platform addresses these gaps by leveraging blockchain technology to create a transparent, secure, and decentralized investment ecosystem. Conventional methods tend to favor large investors, leaving promising startups without sufficient capital. By offering a blockchain-based decentralized platform, our solution cuts out intermediaries and significantly lowers transaction costs. By creating a unique token for each active project, our platform not only provides proof of investment for investors but also transforms these tokens into a mechanism for governance. Investors' token holdings determine their voting power, ensuring that decisions about project milestones and the usage of funds are made democratically. For investors, the platform provides

enhanced security, transparency, and governance mechanisms, making it a more trustworthy alternative to both traditional funding methods and modern crowdfunding platforms, by combining Web3 technologies—on-chain voting, programmable equity tokens, and decentralized fundraising—with intuitive IPFS-based information sharing.

To achieve widespread adoption, our strategy involves a blend of ease-of-use, transparency, and community-driven growth. First, the platform's user interface is designed to be intuitive and straightforward, lowering the technical barrier for both startups and investors. In the short term, we plan to partner with select early-stage startups to serve as launch partners, offering them access to our platform and token tools without upfront fees. This not only populates the platform with real campaigns but also helps validate our infrastructure in live environments. Simultaneously, we will attract retail supporters by offering governance rights through token voting, revenue-sharing incentives, and early supporter perks—making their participation more than just a donation. Additionally, partnerships with startup incubators, accelerators, and industry influencers will help build trust and onboard early users, while targeted marketing campaigns emphasize the reduced costs and added transparency of a blockchain-powered approach. Critically, by minting project-specific tokens only when investments are made, your system ensures that tokens genuinely reflect investment activity; these tokens represent real stakes in the project. The dynamic of allowing investors to later relinquish their voting power through a market-based token buyback further aligns the platform with market realities and investor interests. This multi-faceted approach not only addresses the unmet needs of startups and small-scale investors but also encourages long-term engagement by making every token a meaningful and tradable asset representing both a financial stake and governance rights.

3. Revenue Model & Business Strategy

3.1 Sources of Revenue

3.1.1 Transaction Fees

BlockCrafters generates revenue primarily through transaction fees, a small percentage (e.g., 1-3%) from each successful fundraising campaign. This fee is deducted only when the total amount raised reaches its funding goal. For example, if a startup raises 10,000 ETH and the platform fee is 2%, the startup receives 9,800 ETH while the platform collects 200 ETH. This ensures that fundraisers only incur costs when they successfully secure funding, making the model fair and startup-friendly.

At the same time, the transaction fee is kept low to ensure it does not create a significant financial burden for startups or deter investors. Unlike traditional crowdfunding platforms that often charge 5-10% in fees [4], our minimal fee structure allows startups to retain more of their raised funds for their product development. By balancing affordability and sustainability, BlockCrafters can attract more startups and investors, fostering a thriving decentralized funding ecosystem.

3.1.2 Premium Features and Exclusive Access

Another revenue stream comes from premium features. Startups can opt for a dedicated project status "*Premium*" by paying a fee, which grants them higher visibility on BlockCrafters and priority placement in search results. This helps fundraisers attract more investors by signaling trust and legitimacy, especially for new startups without an established reputation. Investors, on the other hand, can subscribe to premium investor tiers, which offer exclusive benefits such as early access to high-potential fundraising campaigns, priority notifications for new projects, and advanced analytics tools for investment decisions.

These premium offerings create a value-driven differentiation within BlockCrafters. It ensures that high-quality projects gain the visibility they need and provides serious investors with tools to make informed decisions. Besides, the enhanced features are optional instead of mandatory, the

platform can accommodate both casual users and advanced users, achieving a balance between accessibility and monetization.

The revenues from sources above are used to support various aspects of the platform operations. A portion is allocated to server and infrastructure costs, ensuring smooth performance and high availability. Funds also contribute to continuous security audits and smart contract monitoring to safeguard users against vulnerabilities and potential exploits. Additionally, revenue is used in product development, including UI/UX improvements, new features, and better investor tools. Lastly, a portion of the revenue may also be distributed to long-term holders of CFD, to support decentralized governance and incentivize stakeholder engagement.

To sustain long-term growth, part of the revenue may be allocated to marketing efforts and community incentives, driving user adoption and engagement for BlockCrafters.

3.2 Sustainability and Long-Term Growth Plan

Our goal is to build a sustainable, long-term investment platform that makes startup funding easier, fairer, and more transparent for both startups and investors. In the early stage, we will focus on attracting quality startups and individual investors by making the platform simple and accessible. By issuing project-specific tokens as proof of investment and cutting out middlemen, we make the process smoother while keeping all transactions secure and visible on the blockchain.This foundation of trust and transparency will drive adoption and encourage long-term participation.

To address upfront costs, BlockCrafters adopts a phased sustainability model. In the initial stage, platform fees are waived for selected pilot campaigns to drive adoption. As the user base and successful fundraising volume grow, fee-based revenue from a small percentage of raised ETH will help offset operational costs. In the long term, optional premium features such as campaign promotion or analytics may serve as additional revenue streams, supporting sustainable growth.

As more users come on board, we will expand features to support multiple blockchains and allow investors to participate using different tokens or even traditional money. To protect investors, funds will be released gradually as startups meet set goals. Over time, we will collaborate with

larger investors and leverage blockchain transparency to provide detailed data and insights, enabling investors to make well-informed decisions and track startup performance. For example, startups that successfully distribute dividends to investors will be marked as trustable, along with other relevant data, offering investors a clear and reliable credibility indicator that further enhances investor confidence and ensures long-term stability.

While these startups are not publicly listed companies, the project-specific tokens distributed to supporters represent a verifiable, on-chain record of investment. These tokens serve as proof of participation in the funding process and may carry additional functionality, such as governance voting, milestone approvals, or future benefits defined by the project. In future iterations, the platform plans to support features like investment-based dividend distribution, further enhancing the utility of these tokens. This model provides early-stage investors with transparent, token-based engagement while offering startups a flexible yet accountable funding mechanism.

A strong and engaged community is essential for the long-term success of our platform. We will actively seek community feedback and aim to incorporate governance features such as proposals and voting mechanisms. By implementing responsible governance through a decentralized decision-making model, we will empower investors and startups to shape the future of the ecosystem. Transparent communication, regular updates, and continuous adaptation based on user input will help maintain trust and alignment with the needs of all participants. As part of this framework, long-term holders of CFD may participate in platform-level governance and receive revenue-based dividends, reinforcing their role in shaping the ecosystem's future. This collaborative approach will not only enhance platform sustainability but also create a self-regulating system where decisions are driven by real user experiences and market demands.

In the long run, we want our platform to become the go-to place for sustainable startup investment, where funding is open, secure, and accessible to all. We aim to create a safe and supportive environment that encourages great ideas and helps them grow into real businesses. Through continuous innovation, community feedback, and responsible governance, we will build an enduring investment ecosystem that adapts to industry changes and remains beneficial for both startups and investors in the years to come.

3.3 Community-Building Roadmap

To support adoption, we have outlined a structured community-building roadmap. The initial phase focuses on onboarding several startup campaigns through outreach to local entrepreneurial communities, including direct collaboration with entrepreneurship@UBC[1]. These early partners will benefit from waived platform fees, priority onboarding, and featured exposure. To reach our goal of onboarding the first ten startups, we plan to engage student and alumni founders through targeted outreach, startup pitch events, and online channels such as Discord and LinkedIn. We will provide onboarding support, campaign templates, and visibility to early adopters to reduce entry barriers and validate the platform's core functionality. Public beta access will follow, along with community channels and early supporter incentives. Long-term growth will be supported through referral programs, governance-based engagement, and partnerships with accelerators and influencers. This phased strategy ensures adoption grows in tandem with system development, establishing a strong and trusted user base from the outset. While the course-based project is concluding, community engagement efforts, such as supporting early adopters, gathering feedback, and expanding platform adoption, will continue beyond this phase to maintain momentum and support real-world usage.

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[1] https://innovation.ubc.ca/

4. Tokenomics

In our updated architecture, fundraising is conducted in ETH, and each project issues its own project-specific ERC20 token upon successful campaign completion. The total supply of these tokens is directly tied to the project's funding goal. These tokens act as on-chain proof of investment and support additional utility such as milestone voting, governance participation, or future rewards defined by the startup. If a project fails to reach its funding target, all associated tokens are burned, preserving supply integrity and preventing circulation of unbacked assets. Project tokens are freely tradable, allowing for liquidity and potential price discovery on secondary markets. In future iterations, startups may introduce controlled dilution mechanisms such as follow-up fundraising rounds, subject to governance approval within the scope of their token contracts.

In parallel, our platform token is named CrowdFund Token (CFD), which functions as a platform-level utility token, distinct from project-specific tokens. While not involved in individual fundraising processes, CFD is used for governance of the overall platform, access to premium features, and potential participation in platform-wide revenue sharing. It represents a long-term stake in the BlockCrafters ecosystem and supports its continued development and decentralization.

4.1 ERC20 Token Structure

4.1.1 ERC20 Token Basis

Our token is implemented based on the ERC20 standard, with extensions to support the unique functionalities of our project. ERC20 is the industry-standard interface for fungible tokens on Ethereum, widely adopted by decentralized applications (dApps) such as Uniswap, Aave, and Compound.

By leveraging the ERC20 interface, our token ensures seamless compatibility with existing wallets, exchanges, and DeFi protocols, significantly enhancing its usability across the Web3 ecosystem. This compatibility allows our dApp to integrate effortlessly with liquidity pools, staking mechanisms, and governance frameworks, providing users with broader utility beyond our platform.

Furthermore, an ERC20-based token benefits from deep liquidity, as it is inherently supported by major decentralized exchanges (DEXs), making it easier for users to trade and access the token. This built-in liquidity also improves market efficiency and adoption, further strengthening the token's role within our ecosystem.

4.1.2 Token Structure

Our platform token CrowdFund Token (CFD) aligns with the branding of our dApp. The token has the symbol "CFD" and follows the ERC20 standard, ensuring full compatibility with the Ethereum ecosystem. To maintain precision in transactions and avoid rounding errors, CFD has 18 decimal places, which is the widely accepted standard for ERC20 tokens. This level of granularity enables accurate microtransactions and facilitates seamless integration with DeFi applications. The total supply of CFD tokens will be 1 billion (1,000,000,000), a fixed amount designed to balance scarcity and usability while supporting long-term token utility and allocation strategies.

Beyond serving as a medium of exchange, CFD tokens play a key role in governance and revenue distribution within the CrowdFund ecosystem. As a governance tool, CFD enables token holders to participate in decision-making on smart contract upgrades, platform policies, and feature implementations, ensuring that CrowdFund remains decentralized and community-driven. Governance proposals and voting will be executed through smart contracts, ensuring transparency and preventing centralization.

Additionally, CFD tokens serve as a dividend distribution mechanism, rewarding holders with a share of platform revenue. Under the initial tokenomics model, 60% of platform revenue will be allocated to CFD holders, distributed proportionally based on token holdings. This mechanism incentivizes long-term participation while maintaining a sustainable financial ecosystem. Dividend distributions will be automated through smart contracts, ensuring efficiency, fairness, and transparency.

By incorporating these features, CrowdFund Token (CFD) enhances both financial incentives and decentralized governance, creating a dynamic and participatory ecosystem. The token not only facilitates seamless transactions but also empowers the community to shape the platform's future while benefiting from its long-term growth.

4.2 Token Allocation

The initial allocation of CrowdFund Token (CFD) will be conducted through two primary methods: airdropping and direct exchange.

The first method is airdropping CFD tokens to early adopters, including users, stakeholders, and development contributors. Distributing tokens to early participants helps accelerate platform adoption and fosters community-driven growth. By holding CFD tokens, recipients gain governance rights and can actively participate in shaping the platform's policies, technical improvements, and future direction. This approach incentivizes early engagement and strengthens the long-term sustainability of the ecosystem.

The second method is direct exchange, where users can acquire CFD tokens through a fixed exchange rate with stablecoins such as USDC and USDT during the initial two years after launching. Pegging CFD to stablecoins at launch ensures price stability, reducing volatility concerns and making the token a more reliable store of value. This stability encourages users to hold CFD tokens without fear of significant asset depreciation, thereby increasing overall adoption and liquidity in the ecosystem.

The detailed token allocation can be seen from Figure 1. The initial token allocation is as follows.

- 1% to advisors at the initial phase 10,000,000 CFD

- 3% to team members and future employees at the initial phase 30,000,000 CFD

- 6% to CrowdFund community members 60,000,000 CFD

- 50% for Direct Exchange at initial phase 500,000,000 CFD

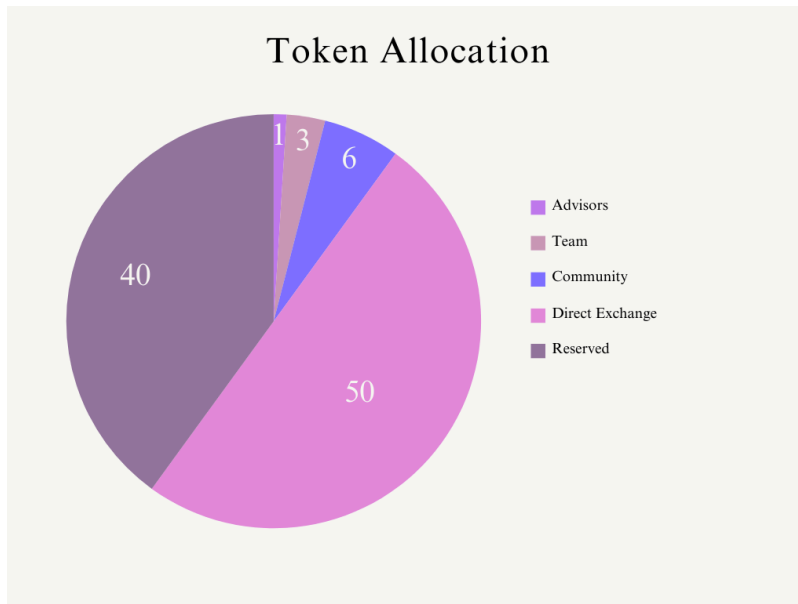- 40% reserved for future use 400,000,000 CFD

Figure 1: Token Allocation

Since CrowdFund Token (CFD) has a fixed total supply of 1 billion tokens, only a portion of the total supply will be publicly distributed and allocated. This controlled distribution ensures that sufficient reserves are maintained for platform incentives, governance, and long-term ecosystem sustainability.

A key aspect of our tokenomics is the direct exchange mechanism, which is specifically designed to address liquidity concerns during the early stages of the platform. By enabling users to acquire CFD tokens through a direct exchange process, we ensure that they have seamless access to the tokens, allowing them to engage with the platform from the outset. This mechanism also facilitates wider adoption, as users can easily obtain CFD tokens without relying on external exchanges or secondary markets.

Another critical component of our token model is the fixed exchange rate policy, which serves as a value stability mechanism. By initially pegging CFD to stablecoins like USDC and USDT, we provide a price floor that helps protect both token holders and fundraisers from extreme volatility. This policy functions as a guarantee of baseline value, ensuring that CFD retains a predictable worth during the early stages of adoption. As a result, users can confidently acquire and hold CFD tokens, knowing that a minimum value threshold has been established, reducing concerns about potential asset depreciation.

Moreover, CFD will also support token swapping functionalities on decentralized exchanges (DEXs) such as Uniswap, allowing users to trade CFD freely on the open market. This ensures that CFD remains liquid, accessible, and interoperable, further strengthening its utility within and beyond the CrowdFund ecosystem.

By integrating a controlled allocation strategy, a direct exchange mechanism, and a fixed exchange rate policy, CFD fosters liquidity, stability, and user confidence, laying a solid foundation for sustainable long-term growth.

4.3 Token Utility

The CrowdFund Token (CFD) serves multiple essential functions within the ecosystem, including platform governance, and dividend distribution. We will have a detailed elaboration about how those functions can help us maintain a healthy and robust platform.

Governance is a fundamental aspect of CrowdFund, ensuring that the platform remains community-driven while maintaining efficiency in decision-making. To prevent governance overload, proposals related to platform policies and smart contract modifications will be held annually. Only shareholders holding at least 5,000,000 CFD (0.5% of the total supply) will be eligible to propose governance changes, including modifications to platform policies or smart contracts. Once a proposal is submitted, all CFD holders can participate in the voting process. A proposal will pass only if at least 50% of the voting shareholders approve it. This governance framework prevents excessive, unstructured proposals while ensuring that decision-making remains transparent, democratic, and community-led.

Another key function of the CFD token is dividend distribution, designed to incentivize long-term token holding and encourage active participation in the ecosystem. In the initial phase, 60% of platform revenue will be distributed as annual dividends to CFD token holders, with allocations determined proportionally based on each holder's share of the total allocated CFD supply. To ensure that dividends primarily benefit long-term token holders, only CFD tokens that have remained untraded for at least three months will be eligible for dividend distribution. This mechanism ensures that stakeholders are directly rewarded for their participation, promoting a stakeholder-driven economic model that strengthens user engagement. By integrating an

automated smart contract-based dividend distribution system, the process remains transparent, scalable, and resistant to manipulation.

Beyond governance and revenue-sharing, maintaining the liquidity and stability of CFD tokens is critical to the long-term sustainability of the CrowdFund ecosystem. To support this, CFD will be integrated with major decentralized exchange (DEX) platforms such as Uniswap, allowing users to freely swap CFD with other tokens, including stablecoins like USDC and USDT. This interoperability ensures that CFD tokens remain liquid and accessible beyond the initial distribution phase.

In addition, supporting token swaps through DEXs enables market-driven price discovery, encourages active trading, and provides users with flexible entry and exit options. These mechanisms not only facilitate the normal circulation of CFD tokens but also help maintain platform stability, user confidence, and scalability as the ecosystem grows.

By integrating robust governance, revenue-sharing incentives, CFD fosters a stable, community-led, and financially sustainable ecosystem. These features ensure that users are incentivized to actively engage with the platform while benefiting from its long-term growth and stability.

5. System Architecture

The system architecture of BlockCrafters is designed to support a secure, usable, and decentralized crowdfunding process by combining smart contract modularity and with a cross-platform user interface. It consists of two core components: a Solidity-based backend that governs project creation, investment, milestone-based fund release, and voting logic, and a Flutter-based frontend that provides a responsive and intuitive interface for both founders and investors.

5.1 Backend

The backend of BlockCrafters is implemented using Solidity smart contracts deployed on the Ethereum blockchain. In order to serve stakeholders, it manages key functionalities such as project creation, milestone management, token issuance, investment handling, etc.

5.1.1 Use Case Diagram
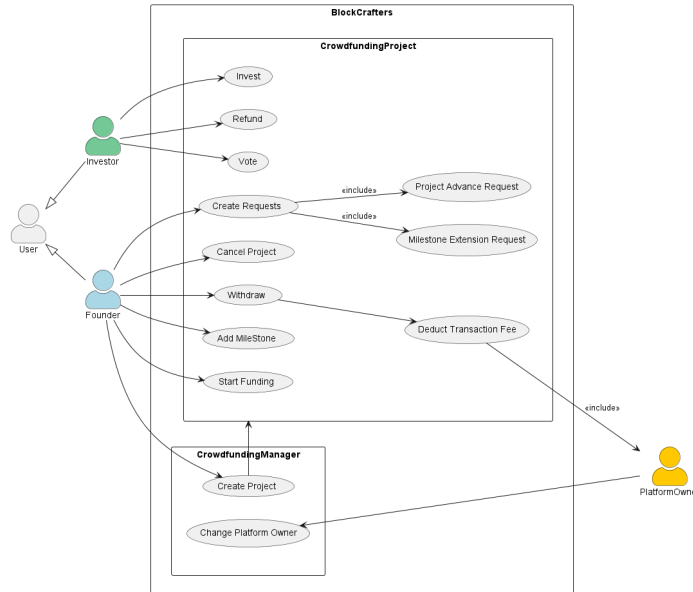
Figure 2. The use case diagram of the proposed crowdfunding platform.

The use case diagram in Figure 2 provides an overview of the key functionalities enabled by the platform for its three primary user roles: **investors**, **founders (startups)**, and the **platform**

owner. Each role interacts with the system in distinct ways, reflecting their unique responsibilities and objectives within the crowdfunding ecosystem.

Investors play a crucial role in supporting projects financially and participating in governance. Investors can contribute funds to projects by investing and receive project-specific tokens as proof of their stake. If a project fails or is canceled, they can request refunds to recover their contributions. Additionally, investors participate in decision-making by voting on critical requests, such as milestone advancements or deadline extensions, ensuring that projects progress transparently and in alignment with their expectations.

Founders use the platform to launch and manage crowdfunding campaigns. They can create new projects through CrowdfundingManager to define their ideas and goals. Founders can add milestones to structure the project into phases, enabling investors to track progress and vote on key decisions. Once milestones are defined, founders can start funding to raise capital. If necessary, they can submit special voting requests, such as milestone extensions or advancement requests, to adapt to changing circumstances. Founders also have the option to cancel their projects if they face insurmountable challenges. Finally, they can withdraw funds as milestones are completed, ensuring that funding is tied to project progress.

The **platform owner** manages platform-level operations. They collect transaction fees from successful projects to maintain infrastructure and services. The platform owner has the authority to transfer ownership of the platform when required to ensure continuity and adaptability.

5.1.2 Smart Contract Functionalities

5.1.2.1 Create Project
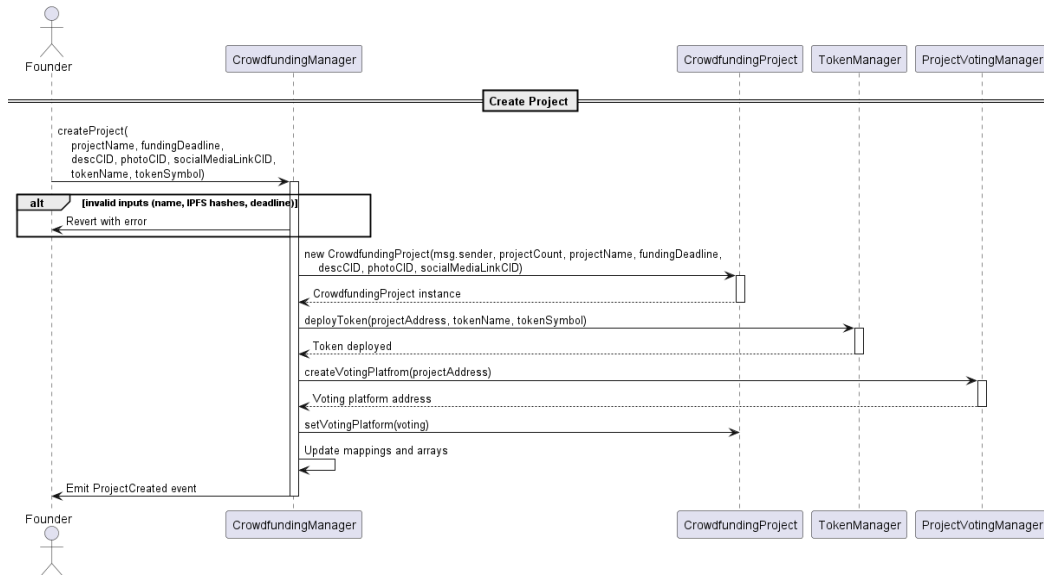
Figure 3. The sequential diagram of the createProject function.

The createProject function is the core component of our crowdfunding platform, enabling founders to initiate new crowdfunding projects. This function ensures a seamless and secure process by validating input parameters, deploying necessary contracts, and linking them together. When a founder creates a new crowdfunding project, the function verifies the project name, IPFS hashes (description, photo, and social media link) and the funding deadline. Invalid inputs result in a transaction revert with an appropriate error message.

A new instance of the CrowdfundingProject contract is deployed to manage the project's funding balance, milestones, and state transitions. The founder's address and project details are passed as parameters during deployment. The CrowdfundingManager then interacts with the TokenManager and ProjectVotingManager to deploy a project-specific token and a voting platform. This entire creation process is wrapped in one single transaction. By this point, a new project is established, but the status is inactive and further milestone creations are still required.

5.1.2.2 Add Milestones and Start Funding
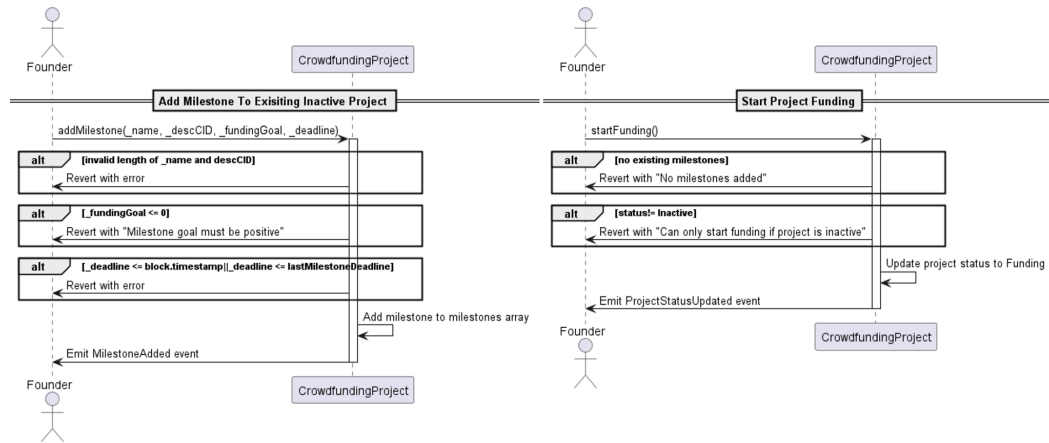
Figure 4. The sequel diagram of the (a)addMilestone (b)startFunding functions.

After the creation of a project, a founder may proceed and call addMilestone to create milestones for the project, allowing founders to define the structure and goals of their project before it is opened for public investment. Each project is required to have at least one milestone, which represent specific objectives or phases of the project, each with its own funding goal and deadline. These milestones serve as checkpoints that ensure funds are released incrementally as the project progresses, providing transparency and accountability to investors.

When the addMilestone function is called, the function validates the inputs, including the milestone name, a description stored as an IPFS CID, a positive funding goal, and a deadline. If any of the inputs are invalid, the transaction is reverted with an appropriate error message, safeguarding the integrity of the project. Once the inputs are validated, the milestone is added to the project's internal milestones array, and a MilestoneAdded event is emitted. Finally, after finishing adding all the milestones for one project, the founder may call the startFunding function to transition the state of the project from "Inactive" to "Funding", opening the project to public investors.

5.1.2.3 Invest
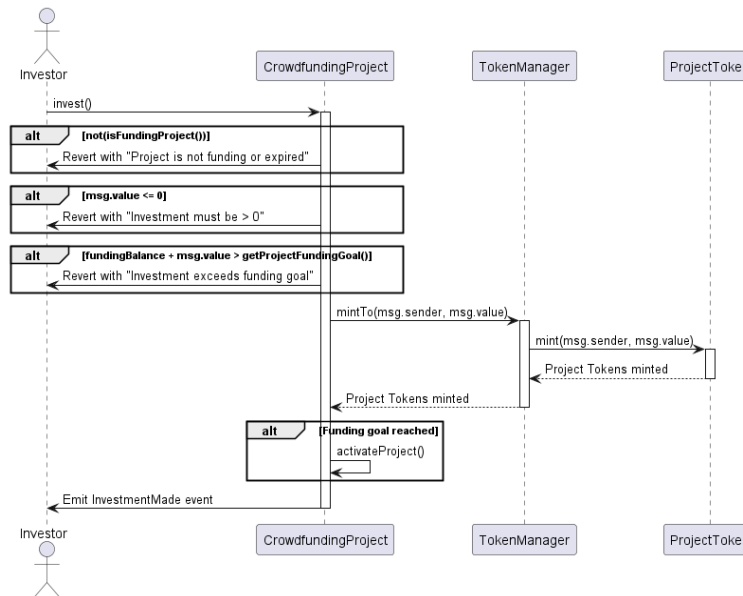
Figure 5. The sequential diagram of the Invest function

The invest function within each CrowdfundingProject facilitates the core interaction between the investors and the crowdfunding projects, allowing investors to contribute to the projects' funding phase. The function ensures that one project can only be invested during the funding phase and that the fundings cannot exceed the total funding goal. Upon successful validation, the function interacts with the TokenManager to mint tokens equivalent to the investment amount. These tokens are then transferred to the investor, representing proof of investment or their stake in the project. Simultaneously, the project's internal funding balance is updated to reflect the new contribution. If the funding goal is reached as a result of the investment, the project transitions to the Active state, allowing further actions from the founder.

5.1.2.4 Voting Requests
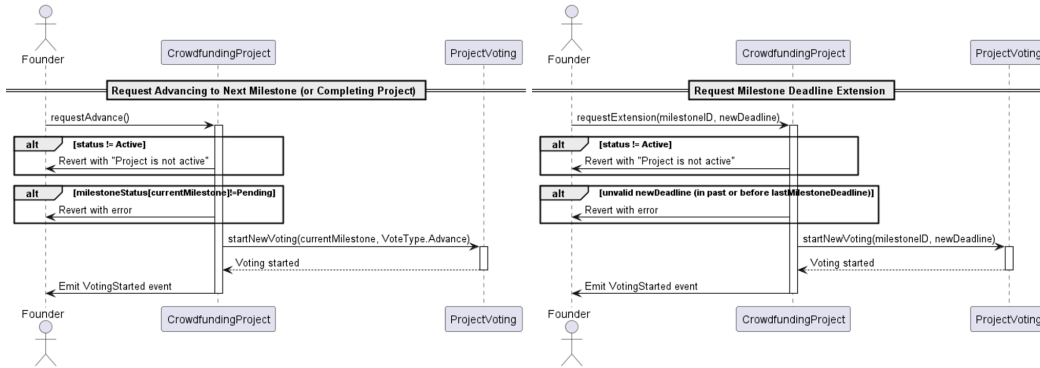
Figure 6. The sequential diagram of the (a) requestAdvance and (b)requestExtension functions.

The crowdfunding projects proceed based on investor governance. To accomplish this, founders may either requestAdvance or requestExtension functions to allow investors participate in. As mentioned in Section 5.1.2.2, the milestone mechanism ensures the releasing of the funds is tightly controlled and aligned with the project's progress. These functions leverage milestones as checkpoints, providing a structured and transparent way to manage funding while safeguarding the interests of both founders and backers. To move to the next milestone, or complete a project, a founder should call the requestAdvance function. After verifying the project and milestone status, the function interacts with the ProjectVoting contract to initiate a new voting process.

Similarly, the requestExtension function enables the founder to request an extension for a milestone's deadline. This is particularly useful when unforeseen circumstances delay the project's progress. The function validates the project status and if the new deadline is valid. Once validated, a voting process is initiated through the ProjectVoting contract, allowing investors to decide whether the extension is justified. This ensures that any changes to the project's timeline are made transparently and with the consent of its stakeholders.

5.1.2.5 Vote
After initializing a voting process, the responsibility shifts to the investors, who participate in governance by casting their votes. The vote function in the ProjectVoting contract facilitates this process. Investors provide the milestone ID and their decision (approve or reject) as inputs. The contract first verifies the existence of an active voting session for the given milestone ID and

25

ensures that the investor has not already voted. These checks prevent invalid or duplicate voting attempts.

Next, the contract retrieves the voting power of the investor from the TokenManager. This voting power corresponds to the balance of project-specific tokens held by the investor at the block number when the voting was initiated. By leveraging the ERC20Votes standard, the contract ensures that the token balance at a specific block is retrievable, effectively preventing issues such as double voting or manipulation of voting power after the voting process begins. Once the voting power is confirmed, the contract records the investor's decision and updates the cumulative positive or negative vote power for the voting session.

The final step in the voting process is the validation of the voting results, which is handled by the validateVotingResult function. This function determines whether the voting session can be concluded based on the accumulated vote power. If the positive or negative vote power exceeds 50%, the voting result is immediately validated, and the session ends. If neither threshold is met, the contract checks whether the voting deadline has passed. If the deadline has elapsed, the result is determined by comparing the positive and negative vote power. If there are more positives than the negatives, the request is approved; otherwise, it is rejected.

5.1.2.6 Withdraw
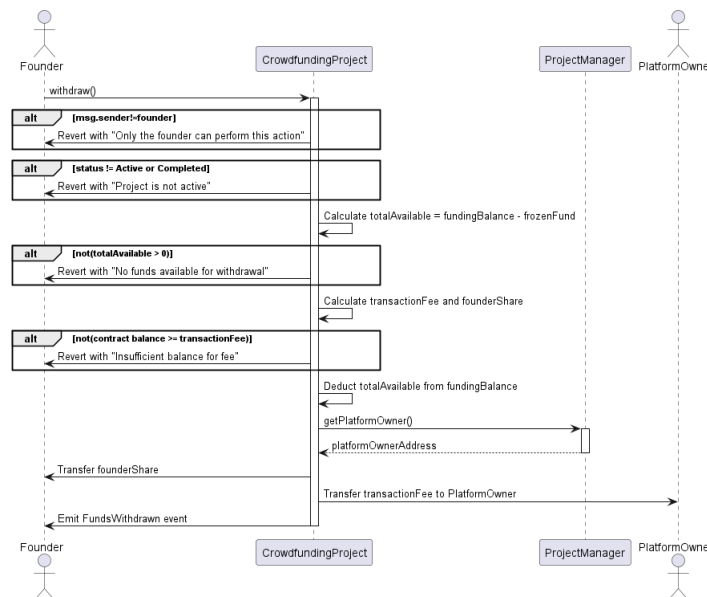
Figure 7. The sequential diagram of the withdraw function.

To access the funds raised for the project, the founder may call the withdraw function in the CrowdfundingProject. This function ties the release of funds to the project's progress, as determined by its milestones. When the withdraw function is called, the contract first performs a series of validation checks. The caller must be the founder of the project, and the project must be in an Active or Completed state. If these conditions are not met, the transaction is reverted. The contract then calculates the total funds available for withdrawal, which is determined by subtracting the frozen funds from the project's funding balance. If no funds are available, the withdrawal is denied.

The release of funds is milestone-dependent. For each milestone, 80% of its funding goal is unfrozen and made available for withdrawal once the project advances to that milestone. Note that 80% of the first milestone goal is unfrozen once the project state moves from Funding to Active phase. For example, if a project has two milestones, each with a funding goal of 1 ether, and the project successfully raises 2 ethers, 80% of the first milestone's funding goal (0.8 ethers) becomes available for withdrawal after the funding phase. Once the project advances to the second milestone through an approved voting process, another 0.8 ethers are unfrozen and made available for withdrawal. Finally, after the last milestone is completed and the project status changes to Completed, the remaining 20% of the funds (0.4 ethers) are unfrozen and can be withdrawn.

Before transferring the funds, the contract calculates a 1% transaction fee, which is deducted from the withdrawal amount and transferred to the platform owner. The remaining balance, referred to as the founder's share, is then transferred to the founder. This ensures that the platform owner is compensated for maintaining the crowdfunding ecosystem.

5.1.2.7 Refund
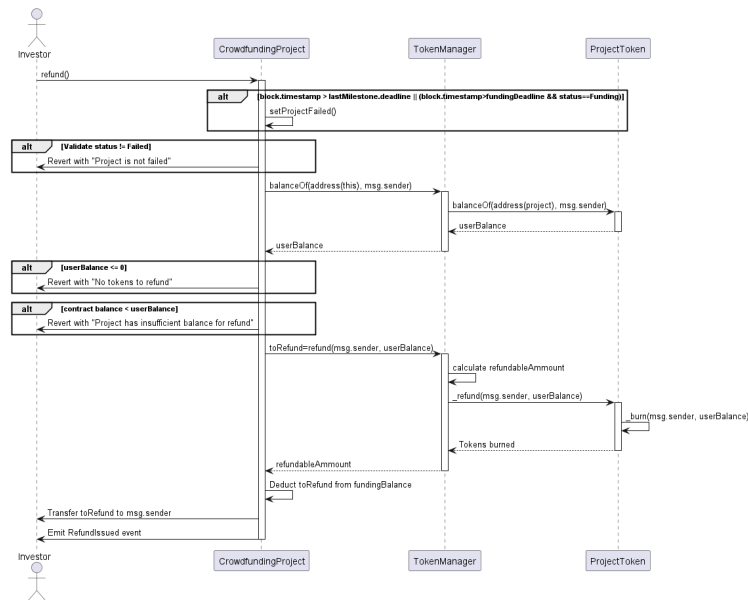
Figure 8. The sequential diagram of the refund function

If a crowdfunding project fails, either because it does not meet its funding goal during the funding phase or because it is canceled or failed due to not accomplishing the milestone goals, investors are entitled to request a refund. This mechanism protects the interests of backers while maintaining accountability for the project.

When an investor calls the refund function, the CrowdfundingProject contract first determines whether the project has failed. This can occur if the funding deadline has passed without reaching the funding goal or if the project is explicitly marked as failed due to unmet milestones or other issues. If the project is not in a Failed state, the transaction is reverted to prevent invalid refund requests. Once the project status is validated, the contract interacts with the TokenManager to check the investor's token balance. This balance represents the investor's stake in the project and determines the refundable amount. If the investor holds no tokens or if the project's contract balance is insufficient to cover the refund, the transaction is reverted. Afterwards, the TokenManager calculates the refundable amount based on the investor's project token holdings and the project's progress. Only the frozen funds would be refundable. The more milestones the project has completed, the smaller the proportion of funds that can be refunded. The TokenManager then instructs the ProjectToken contract to burn the investor's tokens. Finally,

the CrowdfundingProject contract transfers the calculated refund amount to the investor and emits a RefundIssued event to provide transparency.

5.1.3 Unit Testing

In this project, unit tests were implemented using the Hardhat framework and the Chai assertion library. The primary goal of these tests is to verify that the contracts behave as expected, prevent regressions, and ensure that the system is robust against potential vulnerabilities. The unit tests cover a wide range of functionalities, including project creation, milestone management, voting mechanisms, token management, fund withdrawals, and contract upgradability. Each test case simulates real-world scenarios to ensure the contracts handle them correctly. By doing so, the tests provide confidence in the reliability of the system before deployment to a live blockchain network. In this section, a brief introduction to the conducted test cases are provided.

5.1.3.1 CrowdfundingManager and CrowdfundingProject Contract
- Project Creation:
  - Validates that projects can be created with correct parameters.
  - Ensures that invalid inputs, such as past deadlines or invalid IPFS hashes, are rejected.
  - Confirms that multiple projects can be created by the same founder and are correctly recorded in mappings.
- Milestone Management:
  - Tests adding milestones with valid parameters.
  - Ensures milestones with invalid deadlines or goals are rejected.
- Project Funding:
  - Verifies that projects can start funding and accept investments.
  - Ensures investments exceeding the funding goal or made after the deadline are rejected.
  - Confirms that projects transition to the correct status when funding goals are met.
- Fund Withdrawal:
  - Validates that founders can withdraw funds after milestones are approved.
  - Ensures that only founders can withdraw and that withdrawals are correctly calculated with platform fees.
- Refunds:

○ Tests that backers can request refunds if a project fails.

○ Ensures refunds are calculated correctly based on frozen funds.

5.1.3.2 ProjectVoting Contract

● Voting Mechanism:

○ Tests that backers can vote on milestone extensions and advances.

○ Ensures voting results are correctly calculated based on vote power.

○ Verifies that only active projects can initiate voting and that only backers can vote.

● Extension Requests:

○ Validates that founders can request milestone extensions.

○ Ensures extensions are approved or rejected based on voting results.

● Advance Requests:

○ Tests that milestones can be advanced if approved by backers.

○ Ensures projects are marked as completed when all milestones are finished.

5.1.3.3 ProjectToken Contract

● Ownership Management:

○ Tests that only the owner can mint tokens or transfer ownership.

○ Ensures unauthorized accounts cannot perform restricted actions.

● Token Functionality:

○ Verifies that tokens have correct metadata (name, symbol) and balances.

5.1.3.4 Upgradeability Tests

● Contract Upgrades:

○ Verifies that contracts can be upgraded using OpenZeppelin's upgradeable proxy pattern.

○ Ensures the upgraded contract retains the same address and adds new functionality.

5.1.3.5 PriceFeed Contract

● Price Conversion:

○ Tests ETH and BTC to USD conversions.

○ Ensures unsupported tokens are rejected.

As shown in Figure 9, all 70 tests are successfully conducted.

Figure 9. The hardhat unit test results.

5.2 Frontend

5.2.1 Overview

The frontend of the CrowdFund application is developed using Flutter, a well-established and industry-proven cross-platform framework. Leveraging the "write once, run anywhere" capability of the Dart virtual machine, our application can seamlessly support both web and mobile platforms with minimal codebase modification.

In addition, Flutter's elegant and efficient widget system enables us to deliver a user-friendly interface while maintaining low resource consumption. Finally, Flutter's thriving, community-driven ecosystem provides a wealth of plugins, tools, and community support, allowing us to accelerate development and expand functionality with minimal overhead.

The frontend of the application is built using the Flutter SDK and Dart, enabling the development of a fast, reactive, and visually rich user interface. Key technologies integrated into the system include Renown Cloud Appkit, which facilitates secure interaction with blockchain networks through decentralized crypto wallets, and SharedPreferences, which provides lightweight local storage for temporary states such as wallet connection status. The HTTP package is used to communicate with backend APIs and IPFS gateways, while Fluttertoast offers user feedback for actions like transactions or errors. FilePicker supports the selection and preparation of project-related files for upload. Additionally, an IPFS client library is used to integrate decentralized file storage, allowing seamless file uploads and retrieval via Pinata or other gateways.

This technology stack allows the platform to efficiently support decentralized interactions, real-time updates, and seamless smart contract integration, while maintaining high performance and usability.

5.2.2 Frontend UI Structure

5.2.2.1 Frontend UML Diagram
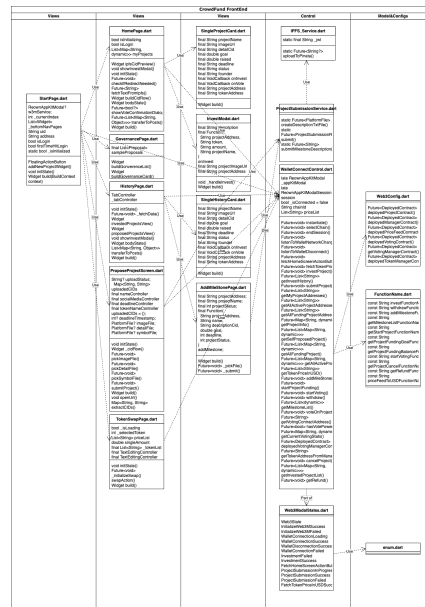
Figure 10: UML diagram of CrowdFund frontend

The frontend application is structured around a minimalistic and intuitive navigation flow, designed to support key user actions such as project discovery, creation, and participation. The interface layout is optimized to serve the needs of both startup founders and retail investors, ensuring a seamless user experience that is both accessible and responsive across various devices and screen sizes.

5.2.2.2 Start Page

As the entry point of the CrowdFund application, the Start Page serves as a central hub for navigating users to core functionalities and managing their meta-information. At the bottom of the screen, a navigation bar provides access to key components of the app, including the Home Page, History Page, Governance Page, and Token Swap Page. The navigation bar features a clean, user-friendly interface with smooth animations, enabling users to become familiar with the platform with minimal learning effort.

At the top, the app bar displays the user's account status, dynamically adjusting its content based on the login state. When connected, it shows the user's account address and profile icon; otherwise, it presents a login button that prompts users to connect their Web3 wallet to access full functionality within the CrowdFund ecosystem.

5.2.2.3 Home Page
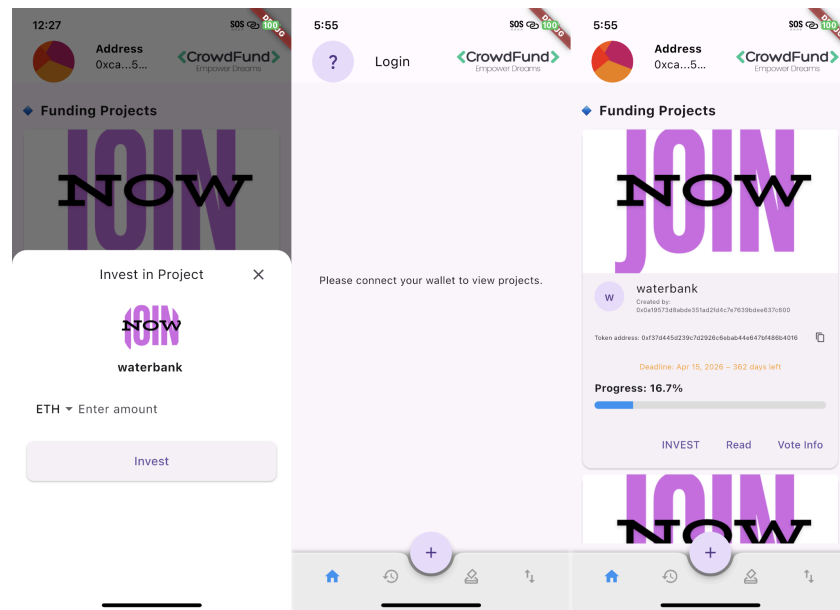
Figure 11: Home Page UI

The Home Page serves as the initial interface users encounter when launching the CrowdFund application. It is designed to be dynamic and responsive to the user's authentication state. If a user is not logged in, the page presents a clear prompt to connect their Web3 wallet, guiding them toward account authentication. Once logged in, the Home Page automatically updates to display the latest funding opportunities and active governance projects, offering a seamless transition into platform engagement.

To enhance usability and user orientation, the page features a clear separation between funding projects and active projects. Funding projects refer to those currently seeking capital, allowing users to explore and support initiatives they believe in. Active projects, on the other hand, are in the post-funding phase and open for milestone voting or governance decisions. This structured

layout helps users easily understand which projects they can invest in versus those they can participate in through governance.

Each project is encapsulated in a Single Project Card component, purposefully designed to convey all relevant information at a glance. These cards display the project name, current status, fundraising progress bar, action buttons (e.g., invest, vote), project contract address, and associated token address. The cards are rendered in a consistent and intuitive layout, allowing users to quickly scan through multiple projects and make informed decisions.

Moreover, the Invest Modal accessible from the Home Page serves as one of the core features of the CrowdFund application. It allows users to freely specify the amount of tokens they wish to invest in a given project, offering a flexible and user-controlled funding experience.

Designed with a clear and minimalistic interface, the Invest Modal is consistent with the visual language of the platform's other components. Its streamlined layout reduces cognitive load and enhances usability, ensuring that users—regardless of experience level—can engage with the platform effortlessly and confidently. This seamless interaction model contributes to an exceptional user experience, reinforcing our commitment to both usability and accessibility.

The visual design of the project cards follows a modern, elegant UI philosophy, combining aesthetic appeal with practical clarity. Subtle animations, color-coded status indicators, and clean typography work together to create a pleasant and informative user experience, minimizing friction and enhancing user satisfaction from the moment they enter the platform.

5.2.2.4 Project Proposal Page
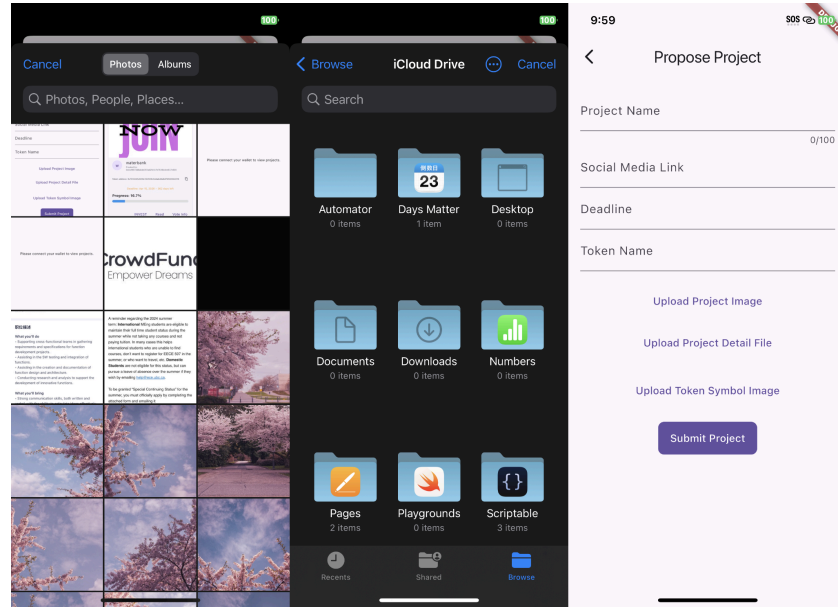
Figure 12: Project Proposal Page UI

The Project Proposal Page serves as a critical component in the CrowdFund project lifecycle, acting as the primary interface for collecting project-related information from users. The page includes multiple structured text fields, enabling users to easily input key project details such as title, description, funding goals, and timelines.

In addition, thanks to the file picker module introduced earlier, users can upload project-related documents and images directly through the system's native file manager, enhancing the page's usability and platform compatibility.

A significant feature of the proposal page is its integration with the InterPlanetary File System (IPFS), which allows the application to process and store large files in a decentralized and efficient manner. Specifically, file uploads are initiated and processed asynchronously while the user interacts with their Web3 wallet, thereby optimizing the project submission workflow and minimizing system resource consumption.

By storing the majority of project-related data on IPFS, the platform avoids excessive on-chain storage costs while also embracing a fully decentralized data architecture. This design choice not only improves performance and scalability but also aligns with Web3 principles of data

ownership and censorship resistance. The technical details of the IPFS integration will be further discussed in a later section.

5.2.2.5 History Page
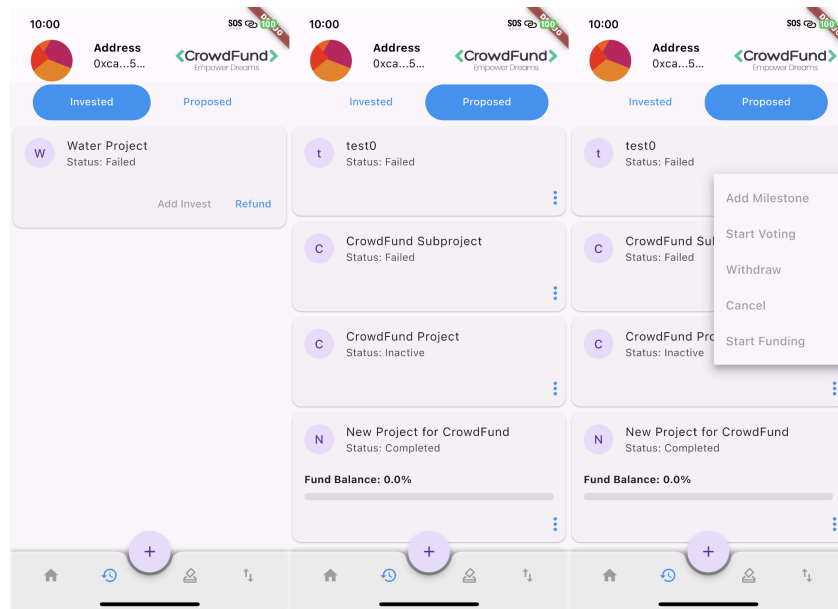
Figure 13: History Page UI

The History Page plays a crucial role in the interaction between users and the CrowdFund application. It provides users with a centralized interface to view and manage both the projects they have invested in and the ones they have proposed. Acting as a comprehensive interaction log, the History Page enhances usability by offering clear access to users' past activities and actionable project records.

The page is divided into two main sections: Invested Projects and Proposed Projects. Users can easily switch between these two views either by tapping the segmented navigation bar at the top or by horizontally swiping across the screen. This intuitive design improves navigation and allows users to distinguish between different types of project involvement with ease.

Each project listed on the page is rendered through a Single History Card Component, which dynamically adjusts its interface depending on the project type (invested or proposed) and its current status (e.g., failed, completed, inactive). This context-aware UI helps reduce cognitive

load and improves task efficiency, enabling users to quickly understand and interact with each project.

Similar to the Home Page, the History Page requires users to connect their Web3 wallet before accessing any project history. This design ensures data privacy, as it prevents unauthorized users—such as anyone with physical access to the device—from viewing or altering the user's project interactions. In line with blockchain principles, users cannot delete records from the history page, as all interaction history is stored immutably on-chain. We believe this approach not only strengthens security but also reinforces one of the core values of blockchain technology—immutability, which CrowdFund upholds as a fundamental design principle.

5.2.2.6 Milestone Submission Page
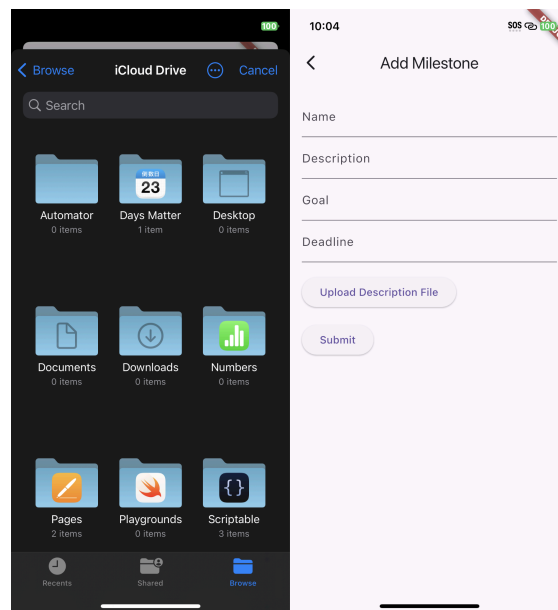
Figure 14: Milestone Submission Page UI

Adding milestones is a key feature of the CrowdFund platform. Rather than requiring users to define a comprehensive and rigid project roadmap during initial submission, our platform allows users to incrementally define multiple milestones throughout the project lifecycle. This approach offers finer-grained control over project execution and provides greater flexibility for startups, enabling them to secure funding in stages as they achieve specific objectives.

The Milestone Submission Page adopts a clean and intuitive user interface, consistent with the design of the Project Submission Page. Leveraging the file picker module, it integrates with the system's native file manager, allowing users to upload milestone-related documents with ease. This design enhances both usability and platform compatibility, ensuring a smooth experience across devices.

5.2.2.7 Community Page
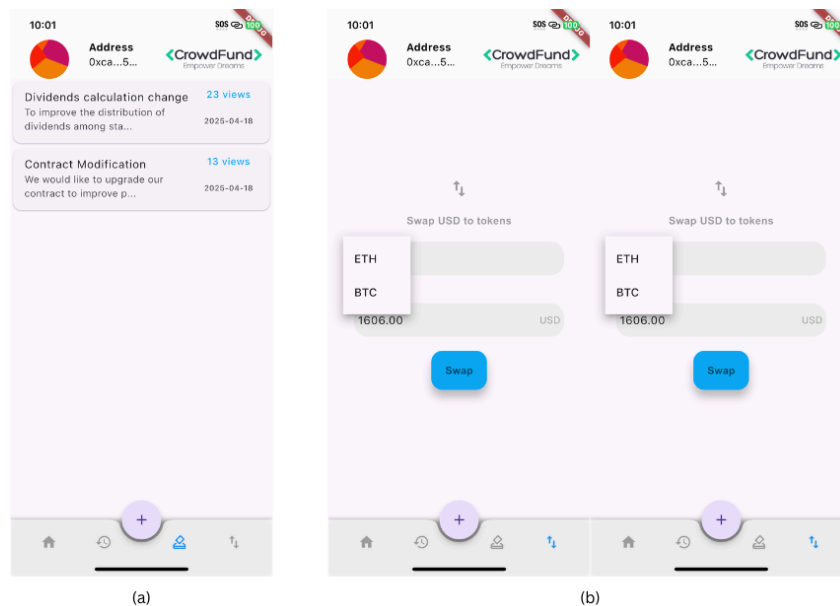
Figure 15. (a)Community Page and (b)Token Swap Page

In line with the decentralized philosophy of our platform, we aim to implement governance-related functionalities in future iterations of CrowdFund. Governance will empower users to actively participate in the platform's evolution by proposing and voting on changes related to smart contracts or platform policies. This fosters a more inclusive, community-driven development model.

To support this vision, our application includes a Community Page, which serves as the central hub for governance activities. Users will be able to view, discuss, and vote on governance proposals that impact the platform. Consistent with the overall design language of CrowdFund, the Community Page offers a clean, visually appealing interface that presents governance content in an accessible and informative manner.

While the current version of the Community Page is not yet interactive—pending full backend integration—we recognize the importance of this feature in cultivating a self-sustaining, transparent, and collaborative ecosystem. We are actively working to bring governance capabilities online in the near future.

5.2.2.8 Token Swap Page

To enhance user accessibility and support interaction with both our platform and other decentralized applications, CrowdFund includes a Token Swap Page. This feature is designed especially for users who may be new to decentralized platforms, providing them with an easy and intuitive entry point into the world of crypto.

By integrating a PriceFeed API and connecting with established crypto token swapping services, the Token Swap Page is capable of displaying real-time exchange rates between supported cryptocurrencies and fiat currencies. This allows users to seamlessly convert their funds into blockchain-compatible tokens, enabling participation in CrowdFund and broader Web3 ecosystems without the need for external tools or complex workflows.

While the swapping functionality is not yet operational due to backend development constraints, it remains a high-priority feature. Given its potential to significantly improve usability and lower the barrier of entry for first-time users, we are committed to making this feature available in the near future.

5.2.3 Reusable UI Components

The frontend architecture leverages modular and reusable widgets to ensure consistency across pages and to streamline user interaction with the blockchain-based backend. These components encapsulate both presentation logic and interaction with smart contracts, allowing for a scalable and maintainable codebase. Two key widgets, SingleProjectCard and SingleHistoryCard, are central to the user interface, each serving distinct roles based on user context.

SingleProjectCard is used on the Home Page to display publicly listed projects in a clean and informative card layout. Each card presents the project image, name, creator information, funding deadline, and token address, with the latter including copy-to-clipboard functionality for

user convenience. The widget dynamically parses the deadline into a human-readable format and calculates the number of days remaining, displaying messages such as "X days left," "Last day," or "Deadline passed." Funding progress is visually represented using a linear progress bar, and numerical details—such as the amount raised, frozen funds, and the goal—are fetched asynchronously from the smart contract. Depending on the project's current status, the card presents context-sensitive action buttons, including "Invest," "Vote," "Read," and "Vote Info." These buttons are conditionally displayed or enabled based on smart contract state, with voting availability depending on the live voting status retrieved from the blockchain. The overall layout is designed to offer real-time interaction while maintaining visual clarity.

SingleHistoryCard is employed on the Project History Page to support project creators in managing their submitted campaigns. In addition to displaying the project name, current status, and funding progress, the widget distinguishes between investor and proposer roles. For investors, the interface provides options to invest or request a refund, with built-in validation to ensure that actions are only available when permitted by the smart contract. For project proposers, the card features a dropdown menu offering several management actions, including adding milestones, initiating the voting process, withdrawing funds, cancelling the project, or starting the funding phase. These actions are guarded by contract-aware conditions and reinforced with user-friendly toast notifications that provide immediate feedback when an action is not permitted. The widget constructs its interface dynamically based on the project's current lifecycle stage and the viewer's role, enabling both flexibility and clarity.

Together, these two components form the core of the user interaction layer, abstracting complex smart contract operations into intuitive and responsive UI elements. Their modular design significantly reduces frontend complexity and supports future expansion of functionality without compromising maintainability.

5.2.4 Web3 Integration and Service Layer

5.2.4.1 EthernetControl.dart

This class serves as a utility layer for managing Ethereum wallet credentials and querying on-chain account balances. It uses web3dart to connect to the Ethereum mainnet via Infura, allowing the app to interact with Ethereum-compatible wallets and contracts.

The class provides three main functionalities. First, it enables real-time balance retrieval using an Ethereum address, returning the wallet's balance in Ether. Second, it offers mnemonic-based wallet recovery by generating a private key and address from a BIP39 mnemonic phrase. This is especially useful for restoring user accounts securely. Third, it allows for the derivation of Ethereum addresses from an existing private key, enabling users to import wallets manually. All derived credentials are stored locally using a custom Storage class for session persistence.

This component is essential for wallet management and Ethereum identity derivation within the app's ecosystem. It abstracts lower-level cryptographic operations while integrating securely with the app's local storage and Web3 interface.

5.2.4.2 WalletConnectControl.dart

This class serves as the main controller for blockchain interactions and wallet connectivity. It manages session states using the BLoC pattern and integrates with ReownAppKitModal to support WalletConnect-based logins via MetaMask and other providers. Upon initialization, it sets the active network (Sepolia), listens for connection and network changes, and updates the UI accordingly.

Functionally, it handles key contract interactions such as submitting projects, investing, adding milestones, voting, and withdrawing. It also supports reading project metadata, retrieving user investment history, and checking vote power. Contract calls are abstracted into structured methods with state emissions for UI response and error handling.

Additionally, the class tracks wallet-specific actions using local storage and dynamically fetches project and token data from deployed contracts. It serves as the logic backbone linking the Flutter frontend with decentralized smart contract operations.

5.2.4.3 Web3ModalStates.dart

This file defines the application states used by WalletConnectControl to manage user interactions with the blockchain. Each state class extends the base Web3State and is used to reflect specific events such as successful or failed wallet connections, investment outcomes, or project submissions. These states are emitted to the UI through the BLoC pattern, allowing the interface to react responsively to contract interactions, loading processes, and user actions. This separation of logic and UI promotes a clean and maintainable architecture.

5.2.4.4 IpfsService.dart

This class handles the uploading of files to the InterPlanetary File System (IPFS) via the Pinata gateway. It supports multipart HTTP requests with metadata encoding, allowing the app to store project-related content—such as images, text descriptions, and social links—on a decentralized file system. The returned IPFS hash (CID) is used to retrieve or reference uploaded content in smart contract interactions.

5.2.4.5 ProjectSubmissionService.dart

This service coordinates the preparation and upload of all required project files—image, description, token symbol, and social media link—to IPFS before initiating smart contract submission. It generates temporary files for textual content, handles upload status tracking, and returns a summary of success or failure. This abstraction simplifies frontend logic and ensures that only fully uploaded projects are passed to the blockchain layer.

6. Future Work

As the current version of BlockCrafters lays the foundation for a decentralized crowdfunding platform, several key features are identified for future development to enhance functionality, investor utility, and long-term platform sustainability.

6.1 Platform Governance Support

To empower the community and promote decentralized decision-making, we plan to implement platform-wide governance mechanisms. In the future, token holders will be able to submit proposals and vote on key platform decisions such as fee structures, feature updates, and policy changes. This will strengthen transparency and allow the ecosystem to evolve based on community needs.

6.2 Token Swapping Functionalities

To improve token liquidity and interoperability, we aim to integrate token swapping capabilities. This will enable investors to exchange project-specific tokens with other cryptocurrencies or tokens directly on the platform. Such functionality will not only enhance user flexibility but also support the overall value of project tokens by providing an exit or conversion path.

6.3 Support for Investment-Based Dividends

We plan to introduce mechanisms that allow startups to distribute dividends or profit shares to their investors based on token holdings. This feature would give project tokens real financial utility beyond voting and governance, encouraging long-term holding and fostering investor trust. It aligns with our long-term vision of making startup investment more transparent, rewarding, and sustainable.

These future enhancements are designed to transform BlockCrafters from a project-based pilot into a comprehensive investment ecosystem, capable of adapting to the evolving needs of decentralized fundraising and community governance.

6.4 Controlled Token Dilution for Follow-up Fundraising

In future versions of the platform, we plan to support controlled token dilution mechanisms that allow startups to conduct follow-up fundraising rounds using their existing project token. This feature would enable startups to mint additional tokens beyond the initial supply, providing flexibility for future capital needs while maintaining continuity within the same investment ecosystem. To prevent misuse and protect investor interests, any additional token issuance would be subject to governance approval by existing token holders, with voting rules and limits

enforced through the project's smart contract. This governance-based approach ensures that dilution is transparent, community-driven, and aligned with long-term project goals.

7. Conclusion

BlockCrafters is a decentralized crowdfunding platform designed to solve key problems in traditional startup fundraising. It lowers entry barriers for both founders and investors, reduces reliance on intermediaries, and introduces on-chain governance through token-based voting. Startups can raise capital more efficiently without relying on traditional intermediaries, while investors receive project-specific tokens that grant both proof of investment and voting power.

The backend uses modular smart contracts to support core operations such as project creation, milestone setup, investment handling, fund withdrawal, and refund processing. The frontend, developed with Flutter, offers a user-friendly and responsive interface that supports web and mobile platforms.

Fund release is linked to milestone completion and investors get involved in governance decisions — in this way, the platform ensures transparency and accountability. Future improvements will include platform-wide governance, token swapping, and dividend distribution. These features will further expand the platform into a complete ecosystem for decentralized startup funding.

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