

GIV3R - THE DECENTRALIZED CHARITY PLATFORM

MAIN PROJECT PHASE 1 REPORT

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of

APJ Abdul Kalam Technological University

by

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(AN ISO 9001:2015 CERTIFIED INSTITUTION)

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Certificate

This is to certify that the Main Project Phase 1 Report titled **“GIV3R - THE DECENTRALIZED CHARITY PLATFORM”** is a bonafide record of the work carried out by **Rohit C (VAS20CS094), Suryajit Ithiparambil Sudheeran (VAS20CS117), Sreenath M S (VAS20CS110), Sudarsanan V P (VAS20CS114)** of Vidya Academy of Science & Technology, Thalakkottukara, Thrissur - 680 501 in partial fulfillment of the requirements for the award of **Degree of Bachelor of Technology in Computer Science and Engineering** of **APJ Abdul Kalam Technological University**, during the academic year 2023-2024.

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ABSTRACT

The philanthropic landscape has long been characterized by challenges in transparency, efficiency, and unified engagement. This project introduces a novel solution – a decentralized charity platform developed using Next.js for both frontend and backend, underpinned by the transformative capabilities of blockchain technology. Grounded in the mission to redefine charitable contributions, this platform embodies key features such as real-time tracking of fund utilization, streamlined fundraising campaigns, and a centralized space for volunteers and charity organizations.

Against the backdrop of a traditional and sometimes opaque charitable ecosystem, the platform seeks to empower donors with unprecedented transparency, allowing them to witness firsthand how their contributions impact meaningful causes. Simultaneously, it aspires to revolutionize the efficiency of fundraising campaigns, enabling charities to reach their targets swiftly and donors to experience a seamless contribution process. The platform's centralized hub for volunteers and charity organizations promises a paradigm shift in coordination, fostering collaboration and communication in pursuit of impactful initiatives.

By incorporating stringent charity organization verification processes, the platform aims to establish a foundation of credibility, ensuring users engage with legitimate entities. With a commitment to user feedback, security measures, and legal compliance, this project envisions not only a technically advanced decentralized charity platform but a catalyst for positive change in the broader charitable landscape.

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Chapter 1

INTRODUCTION

1.1 General

Within the philanthropic landscape, the amalgamation of technology and altruism is re-shaping the dynamics of charitable contributions. This project unveils a cutting-edge decentralized charity platform leveraging the power of blockchain technology. Striving to overcome challenges inherent in traditional donation frameworks, the platform introduces innovative features to enhance transparency, streamline fundraising, and foster a unified space for volunteers and charity organizations.

1.2 Objectives of the Work

The primary objectives of this project revolve around creating a decentralized charity platform that redefines the philanthropic experience. Firstly, the platform aims to enhance transparency by leveraging blockchain technology to enable real-time tracking of fund utilization, providing donors with unprecedented visibility into the impact of their contributions. Secondly, it seeks to streamline fundraising processes, promoting efficiency and quicker campaign successes. Additionally, the project aims to establish a centralized space that unifies volunteers and charity organizations, fostering better coordination and communication for impactful initiatives. By incorporating features such as incentive mechanisms for volunteers and a robust verification process for charity organi-

zations, the platform strives to build trust and credibility within the charitable ecosystem. Overall, the objectives encompass not only technical advancements but also a profound impact on the way charitable contributions are made and experienced.

1.3 Motivation for this work

The motivation for undertaking this project stems from the recognition of persistent challenges within the traditional charitable landscape. There exists a crucial need to address issues of transparency, efficiency, and engagement in philanthropy. Donors often seek greater visibility into how their contributions are utilized, and charities grapple with the complexity of fundraising and volunteer coordination. The advent of blockchain technology provides a transformative opportunity to revolutionize these aspects, offering real-time tracking of fund utilization and secure, transparent transactions. This project is driven by the aspiration to empower donors with a tangible understanding of their impact, streamline the fundraising process for charities, and create a centralized platform that encourages seamless collaboration between volunteers and charitable organizations. By leveraging cutting-edge technology, this work aims to introduce a paradigm shift in the philanthropic experience, fostering a more transparent, efficient, and engaged approach to charitable contributions.

Chapter 2

Problem Definition

2.1 Problem Statement

The charitable sector faces persistent challenges, including a lack of transparency in fund utilization, inefficient fundraising processes, and fragmented volunteer engagement. Donors often grapple with uncertainties regarding the impact of their contributions, while charities contend with complex and time-consuming fundraising methods. Existing platforms fall short in providing a unified space for volunteers and charity organizations to coordinate effectively. This project addresses these issues by proposing a decentralized charity platform. The goal is to leverage blockchain technology for real-time tracking of fund utilization, streamline fundraising campaigns, and establish a centralized hub for seamless volunteer engagement. The problem at hand is the inadequacy of current systems in meeting the evolving needs of donors, charities, and volunteers, necessitating the development of a technologically advanced solution to enhance transparency, efficiency, and collaboration in the charitable ecosystem.

2.2 Objectives

In this project, the aim is to develop a decentralized charity platform. The specific objectives that we aim to complete for this project are:

- Enhance transparency through real-time tracking of fund utilization.
- Streamline fundraising processes for quicker and more efficient campaign successes.
- Create a centralized platform for volunteers and charity organizations.
- Implement an incentive mechanism to motivate volunteers for increased engagement.
- Establish a robust verification process for charity organizations to build trust.
- Design an intuitive and user-friendly interface for an accessible user experience.

Chapter 4

SYSTEM DESIGN

The decentralized charity platform is designed with simplicity and effectiveness in mind. The backend, responsible for core functionalities, manages user authentication, campaign processes, and interactions with the blockchain network. Smart contracts on the blockchain handle critical aspects like campaign details, fund utilization, and transaction recording. The database stores essential data such as user and campaign information.

On the frontend, the user-friendly interface seamlessly integrates with the backend through API routes, providing easy navigation for users through campaigns, volunteer opportunities, and transaction tracking. An incentive system, driven by smart contracts, ensures active volunteer participation by recording and distributing rewards. The system prioritizes security measures for user data integrity, and its modular structure, coupled with load balancing, supports scalability to accommodate a growing user base. Community engagement is fostered through features like forums and social sharing, creating a dynamic and collaborative environment within the decentralized charity platform.

4.1 System Architecture

4.1.1 Backend Architecture

The backend, driven by Next.js, constitutes the core engine of the platform. Beyond facilitating standard backend functionalities, it plays a pivotal role in user authentication

processes, orchestrating the entire campaign lifecycle, and ensuring fluid interactions with the underlying blockchain network. This encompasses not only the initiation and conclusion of campaigns but also the real-time tracking of fund utilization and the secure recording of transactions. The adoption of Next.js brings a level of versatility and efficiency to backend operations, contributing to a robust and dynamic foundation for the decentralized charity platform.

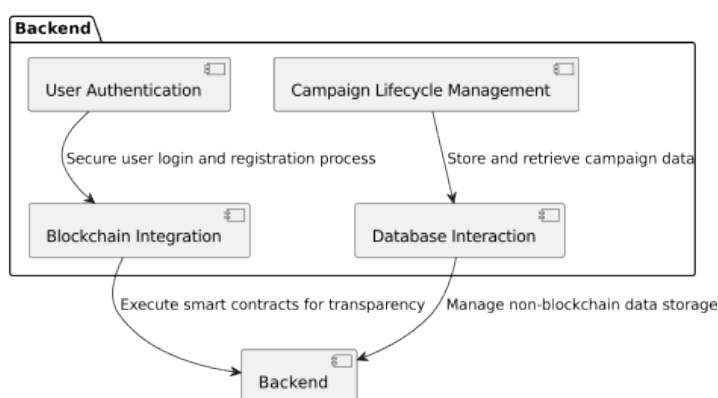


Figure 4.1: Backend

Crucial functions are carried out through the implementation of smart contracts on the chosen blockchain network, whether it be Ethereum or Binance Smart Chain. These smart contracts govern key aspects such as campaign details, transparent fund utilization, and the immutable recording of transactions. By leveraging blockchain technology, the backend establishes a secure and decentralized framework, enhancing trust and ensuring the integrity of critical processes, ultimately contributing to a transparent and accountable charitable ecosystem.

4.1.2 Database Management

At the heart of non-blockchain data management lies the database, with options including MongoDB or PostgreSQL. This repository efficiently stores user profiles, campaign details, and other non-blockchain data, optimizing data retrieval processes. The choice of database is instrumental in ensuring the seamless communication between frontend and backend components, fostering a smooth user experience. This section of the architecture underscores the importance of an optimized and well-managed database in supporting the overall functionality and performance of the decentralized charity platform.

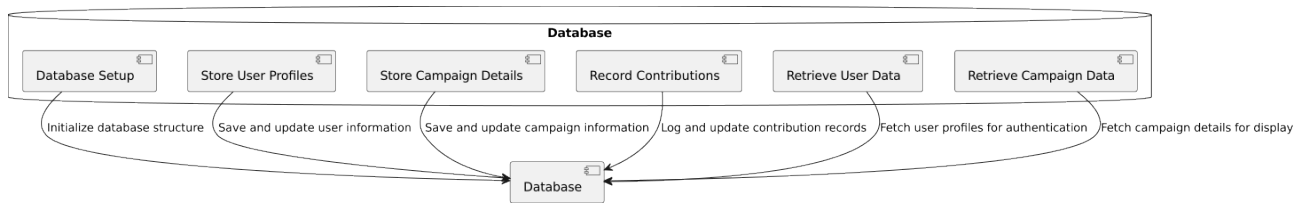


Figure 4.2: Database

4.1.3 Frontend Design

The frontend, crafted for optimal responsiveness using Next.js, is the user's gateway to the platform. Beyond aesthetics, it aims to provide an intuitive and seamless navigation experience. By integrating seamlessly with the backend through API routes, it ensures a cohesive user journey. The frontend's responsiveness is not just about aesthetics; it directly contributes to the overall user experience, ensuring that users can easily navigate campaigns, volunteer opportunities, and transaction tracking. This emphasis on a user-centric design is essential for creating an engaging and accessible platform.

4.1.4 Blockchain Integration

The integration with a blockchain network is a defining feature of the platform, leveraging the decentralized and transparent nature of smart contracts. These contracts, executed on either Ethereum or Binance Smart Chain, govern critical functionalities such as fundraising campaigns, fund utilization transparency, and the immutable recording of

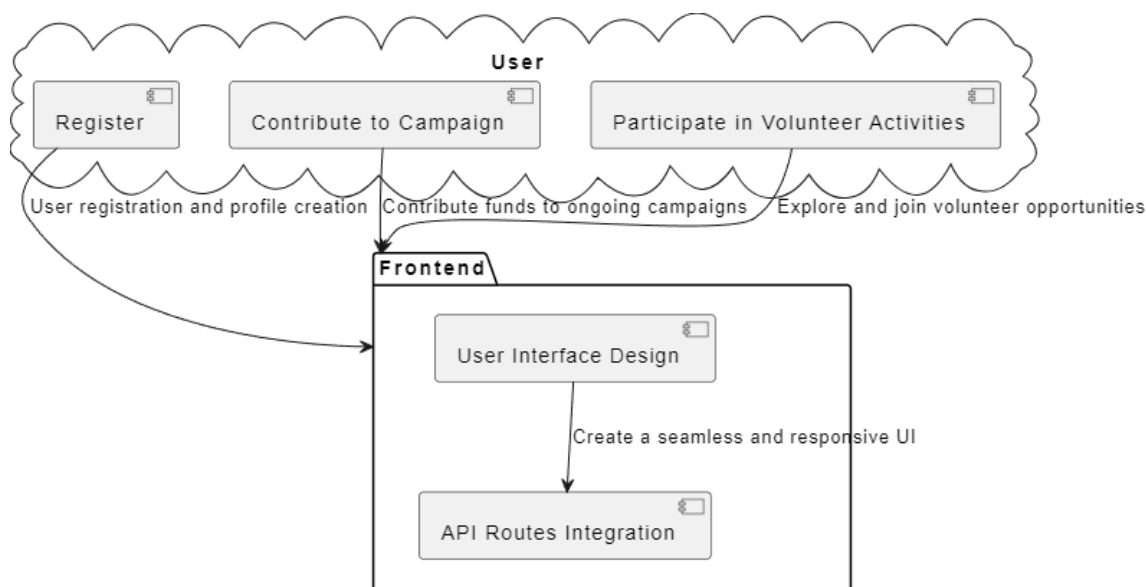


Figure 4.3: Frontend

transactions. This integration ensures that the decentralized charity platform operates on a foundation of security, transparency, and trust. It positions the platform at the forefront of technological advancements, showcasing the transformative potential of blockchain in redefining charitable contributions.

4.2 Data Flow Diagram

A Data Flow Diagram (DFD) for the decentralized charity platform offers a visual representation of the flow and transformation of data within the system. At its core, the DFD illustrates how information moves between different components, shedding light on the interactions between users, the platform's backend, the blockchain network, and the database. This graphical representation serves as a powerful tool to comprehend the intricacies of data movement and processing within the decentralized charity ecosystem.

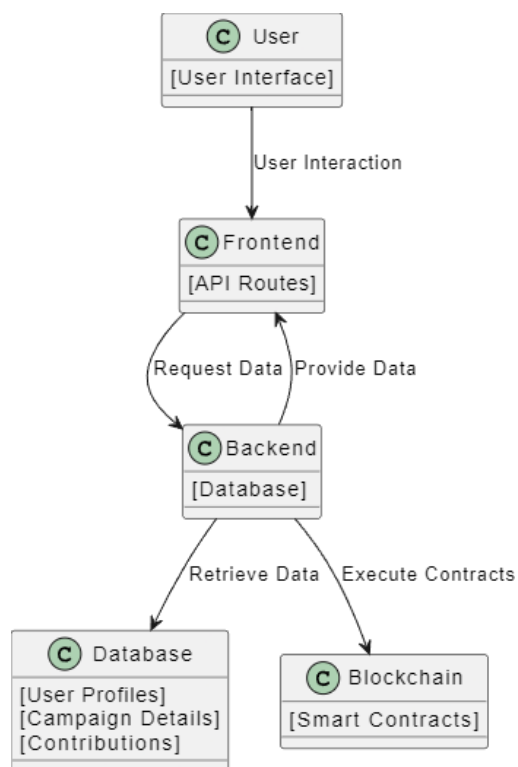


Figure 4.4: Data Flow Diagram.

Chapter 5

USE CASE DIAGRAM

The use case diagram for the decentralized charity platform provides a high-level visual representation of the system's functionality by illustrating various interactions between actors and the system. In the context of this project, the use case diagram serves as a pivotal tool to outline the different ways in which users, including donors, charity organizations, and volunteers, interact with the platform. It encapsulates key functionalities and scenarios, highlighting the system's capabilities in facilitating transparent and efficient philanthropic activities. This diagram not only showcases the primary actors involved but also delineates the specific use cases or functionalities they engage in, such as registering on the platform, creating or contributing to campaigns, and participating in volunteer activities. The use case diagram, therefore, acts as a visual roadmap, offering a clear and concise overview of how different users interact with the decentralized charity platform to achieve their respective goals and contribute to the overarching mission of supporting charitable causes.

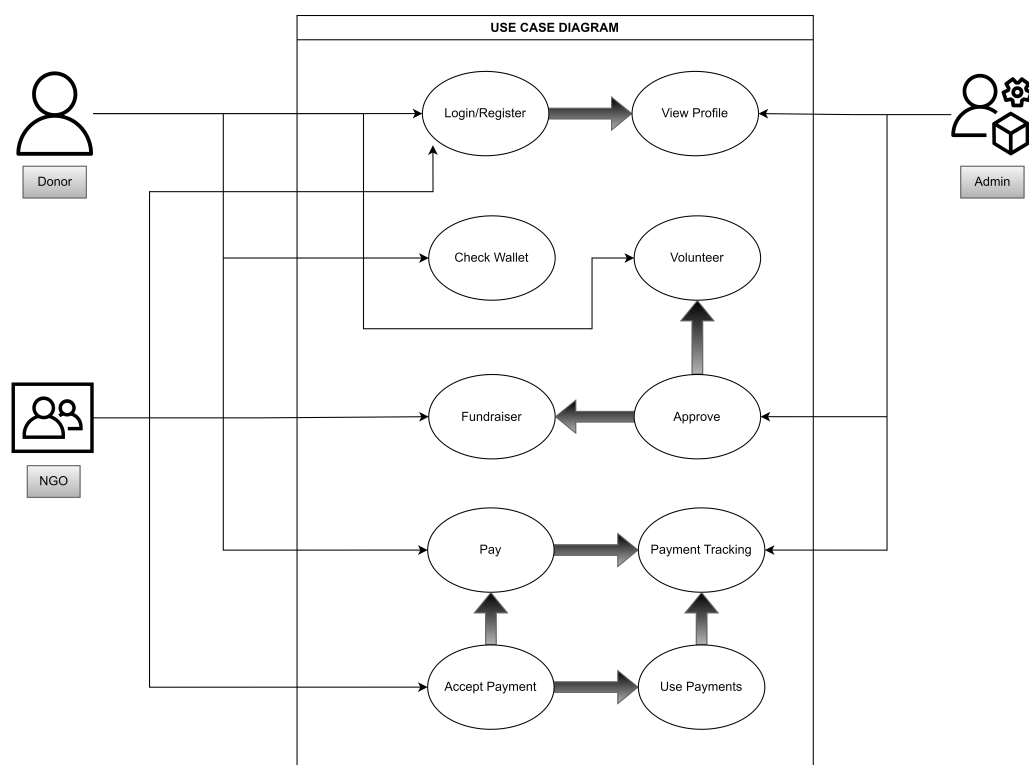


Figure 5.1: Use case Diagram

Chapter 6

METHODOLOGY

The methodology section serves as the foundational framework detailing the systematic approach undertaken to conceptualize, develop, and implement the decentralized charity platform. This crucial section provides insights into the organized sequence of steps and processes employed throughout the project's lifecycle, outlining the specific strategies and tools used to achieve key milestones. From requirement analysis to deployment and beyond, the methodology section serves as a roadmap, guiding the reader through the intricacies of decision-making, technology selection, and the practical steps taken to bring the vision of a decentralized and transparent charity platform to fruition. The methodologies employed in backend development, blockchain integration, database implementation, frontend design, and other critical facets are elucidated, offering a comprehensive understanding of the systematic and strategic nature of the project's execution.

6.1 Backend Development

In the realm of backend development, a pivotal aspect is the implementation of secure user authentication processes utilizing Next.js. This entails the creation of robust mechanisms for user registration, login, and profile management, fostering a secure and personalized experience for platform users. Simultaneously, emphasis is placed on the development of functionalities for managing the complete lifecycle of fundraising campaigns. This involves the creation, monitoring, and closure of campaigns, encompassing tasks

such as setting campaign goals, real-time progress tracking, and effective handling of contributions. The objective is to create a backend infrastructure that seamlessly accommodates user interactions and ensures the dynamic management of charitable initiatives.

6.1.1 Blockchain Integration

Within the Blockchain Integration module, the focus shifts to the development of smart contracts on the chosen blockchain, be it Ethereum or Binance Smart Chain. These smart contracts play a critical role in executing crucial functionalities related to campaign management. They encapsulate the logic for managing campaign details, ensuring transparent fund utilization, and recording immutable transactions. Subsequently, the backend is integrated with the blockchain network through technologies like Web3.js or Ethers.js. This integration facilitates seamless communication between the platform and the blockchain, enabling the execution of smart contracts and ensuring the transparent and secure orchestration of charitable operations.

6.1.2 Database Implementation

In the Database Implementation phase, the initial step involves setting up the selected database system, whether MongoDB or PostgreSQL. This includes the creation of tables and indexes tailored to the platform's requirements, with a keen focus on optimizing data retrieval efficiency. The subsequent step revolves around the implementation of backend logic for database interaction. This encompasses the storage and retrieval of crucial non-blockchain data, such as user profiles and campaign details. The database becomes a cornerstone for the platform, providing a robust foundation for efficient data management and retrieval.

6.1.3 Frontend Development

The Frontend Development segment is centered on creating an engaging and user-friendly interface using Next.js. The design and implementation of the frontend are meticulously

executed to ensure an intuitive and visually appealing user experience. Special attention is given to responsiveness, ensuring a consistent and seamless interaction across various devices. Concurrently, API routes are established to connect the frontend with the backend, facilitating a cohesive data flow and interaction between the user interface and backend functionalities. This section aims to deliver a compelling and accessible frontend interface that enhances the overall user journey within the decentralized charity platform.

Chapter 7

EXPECTED RESULTS

The implementation of the decentralized charity platform is expected to yield a transformative and transparent philanthropic environment. Donors will experience heightened confidence through blockchain-driven transparency, tracking fund utilization seamlessly. Campaign management for charity organizations will be streamlined, fostering efficient goal setting, progress tracking, and contribution handling. Robust user authentication processes will ensure a secure and personalized experience, while an incentivized system will boost volunteer participation. Community engagement features like forums and social sharing will contribute to a collaborative ecosystem. Real-time tracking and reporting will grant donors immediate visibility into their contributions' impact, enhancing satisfaction. The scalable and responsive platform, with a user-friendly Next.js interface, is poised to accommodate growing user engagement. The verification process for charities enhances trust, while iterative updates based on feedback ensure continuous improvement. Overall, the platform aims to deliver a credible, efficient, and user-centric solution for decentralized philanthropy, documented comprehensively for future reference.

Chapter 8

CONCLUSION

In conclusion, the development of the decentralized charity platform represents a significant leap towards revolutionizing philanthropy through transparency, efficiency, and user engagement. The implementation of secure user authentication, streamlined campaign management, and blockchain-driven fund transparency ensures a robust and trustworthy platform. The incentivized system encourages active volunteer participation, fostering a vibrant and collaborative community. Features like forums and social sharing contribute to an interactive ecosystem, enhancing the overall user experience. Real-time tracking and reporting provide donors with immediate insights, promoting accountability. The scalable and responsive architecture, coupled with a user-friendly Next.js interface, positions the platform for sustainable growth. The verification process for charities instills trust, and iterative updates based on user feedback ensure continuous refinement. In essence, the decentralized charity platform aims to reshape charitable contributions, making philanthropy more accessible, accountable, and impactful for all stakeholders involved.

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