



e-ISSN: 2319-8753 | p-ISSN: 2347-6710

# IJRSET

International Journal of Innovative Research in  
**SCIENCE | ENGINEERING | TECHNOLOGY**



# INTERNATIONAL JOURNAL OF INNOVATIVE RESEARCH

IN SCIENCE | ENGINEERING | TECHNOLOGY

Volume 13, Issue 5, May 2024

**ISSN** INTERNATIONAL  
STANDARD  
SERIAL  
NUMBER  
INDIA

Impact Factor: 8.423

 9940 572 462

 6381 907 438

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 [www.ijirset.com](http://www.ijirset.com)

# Crowdfunding Website: Hosting on AWS

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**ABSTRACT:** In the dynamic landscape of modern finance, crowdfunding has emerged as a powerful force, particularly through equity-based platforms, offering innovative avenues for investment and entrepreneurship. This project delves deeply into the intricate architecture and deployment strategies behind an equity-based crowdfunding website, shining a spotlight on the indispensable role played by Amazon Web Services (AWS) in both hosting and scaling such a platform. At the forefront of user engagement and experience, the crowdfunding website harnesses the versatile capabilities of CSS and React for its front-end interface, ensuring a seamless and captivating journey for users. Meanwhile, the back-end infrastructure relies on the robust foundation of ASP.NET Web API, creating a sophisticated framework for handling data and operations. The adoption of a three-tier architecture, complemented by the integration of Swagger for API documentation, further strengthens the platform's resilience and transparency in its backend operations. AWS emerges as the driving force behind unlocking the full potential of this crowdfunding platform. Leveraging a suite of AWS services, including Amazon RDS for hosting Microsoft SQL Server, S3 buckets for efficient frontend asset storage, and Elastic Beanstalk for flexible backend deployment and scaling, the platform achieves unparalleled reliability and scalability. Moreover, AWS's advanced security features, encompassing distinct security groups and IPv6 addressing, play a crucial role in fortifying the platform against cyber threats while simultaneously enhancing network accessibility.

**KEYWORD :** Crowdfunding , React, AWS , ASP.NET, S3 Bucket, RDS

## I. INTRODUCTION

In the rapidly evolving of online finance, crowdfunding has emerged as a transformative catalyst, reshaping investment paradigms and fostering entrepreneurial ventures. This report offers a comprehensive exploration of a Crowdfunding Website that specializes in equity offerings, situated at the dynamic convergence of technology and finance. At its essence, this endeavor epitomizes innovation, leveraging state-of-the-art technologies to deliver seamless user experiences and robust backend functionalities. The Crowdfunding Website leverages the power of React, a versatile JavaScript library acclaimed for its efficiency and adaptability. Through the integration of React Router, Redux, and Fetch API, the platform ensures fluid navigation, efficient state management, and seamless data retrieval. Augmented by Bootstrap for responsive design, React Helmet for SEO optimization, and React-Toastify for user-friendly notifications, the frontend interface delivers a polished and intuitive user experience. The Crowdfunding Website relies on the formidable duo of ASP.NET Core and C#, renowned stalwarts of web development esteemed for their performance and scalability. Swagger facilitates comprehensive API documentation, streamlining developer workflows, while Dapper Nugget provides lightweight data access for streamlined database interactions. Serilog enhances logging capabilities, ensuring robust monitoring and diagnostics, while JWT Authentication fortifies security, safeguarding user data and transactions. Amazon Web Services (AWS) serves as the cornerstone of the Crowdfunding Website, furnishing a resilient and scalable foundation for its operations. RDS (Relational Database Service) hosts the Microsoft SQL Server database, ensuring data integrity and reliability. S3 buckets serve as repositories for frontend assets, enabling efficient content delivery and storage. Elastic Beanstalk orchestrates backend service deployment and scaling, simplifying infrastructure management and enhancing

adaptability. Security constitutes a paramount consideration in the architecture of the Crowdfunding Website, with meticulously configured security groups regulating access and mitigating risks.

## II. RELATED WORK

Kickstarter, Indiegogo, and GoFundMe stand as prominent examples of general crowdfunding platforms that have fundamentally altered the landscape of fundraising for individuals and organizations alike. These platforms function as centralized hubs, providing creators, entrepreneurs, activists, and individuals in need with a global stage to present their ideas, ventures, or causes, thereby inviting financial support from a diverse audience of backers who resonate with their vision or empathize with their circumstances. [1]A notable strength of these platforms lies in their adaptability, accommodating a wide spectrum of projects spanning various categories such as creative endeavors, product launches, charitable endeavors, and personal emergencies. [2]This inclusivity enables users from diverse backgrounds and with disparate objectives to leverage crowdfunding as a means to advance their aspirations. Whether seeking funding for an innovative gadget, a cinematic endeavor, an artistic installation, a community initiative, or medical expenses, individuals and organizations can utilize these platforms to tap into a broad pool of potential supporters. The success of crowdfunding campaigns on platforms like Kickstarter, Indiegogo, and GoFundMe pivots on their capacity to harness the collective contributions of a global community of backers.[3] By rallying support from numerous individuals who may contribute modest to moderate sums, creators can aggregate sufficient funds to realize their ideas or address pressing needs. This democratization of finance facilitates the viability of projects that might otherwise struggle to secure traditional funding, thus enabling them to garner momentum and achieve their funding objectives.

## III. METHODOLOGY

**Project Proposal:** The process begins with entrepreneurs or project initiators submitting a detailed project proposal outlining the objectives, financial requirements, and potential benefits of the venture. The proposal should clearly articulate how the project aligns with Islamic finance principles, including avoiding interest (riba), gambling (maysir), and investments in haram (forbidden) activities.

**Compliance Review:** A board or committee comprised of Islamic scholars and financial experts reviews the project proposal to ensure compliance with Islamic finance principles. This review involves assessing the proposed activities, financial structures, and investment terms to ensure they adhere to law. Prohibited activities such as interest-bearing transactions, speculative trading, and investments in industries deemed (e.g., alcohol, gambling) are strictly avoided.

**Equity-based Crowdfunding:** crowdfunding typically operates on an equity-based model where investors receive shares in the business in exchange for their investment. Profit and loss sharing agreements are established, wherein investors provide capital and share in the profits or losses generated by the project.

**Investor Selection:** Once the project proposal is approved by the Shariah board, it is presented to potential investors who are interested in supporting Shariah-compliant ventures. Investors evaluate the project based on its alignment with Islamic finance principles, potential returns, and risk factors before deciding to fund the project.

**Fund Transfer under Supervision:** Funds are transferred from investors to the project under the supervision of regulatory authorities or trusted intermediaries. This ensures that all transactions are conducted in accordance with Islamic finance principles and comply with relevant laws and regulations.

**Profit/Revenue Sharing:** In equity-based crowdfunding, investors become shareholders in the project and are entitled to a share of the profits generated by the business. Profit distribution is based on the agreed-upon profit-sharing ratios outlined in the agreement.

**Monitoring and Reporting:** Continuous monitoring and reporting mechanisms are established to ensure that the funds are utilized in accordance with the project objectives and Islamic finance principles. Regular audits and financial reports are conducted to provide transparency and accountability to investors and stakeholders. Any

deviations from compliance are promptly addressed and rectified to maintain the integrity of the crowdfunding process.

**Restrictions on Investments:** Crowdfunding platforms impose restrictions on the types of investments allowed to ensure compliance with Islamic finance principles. Investments in speculative or highly leveraged activities, as well as those associated with haram industries, are prohibited to uphold ethical standards.

#### IV. PROPOSED WORK

##### Platform Enhancement:

Develop a user-friendly and intuitive crowdfunding platform that caters to a diverse range of projects, including creative endeavors, product launches, charitable causes, and personal fundraising campaigns. Implement features to improve project discovery, enhance communication between creators and backers, and streamline the crowdfunding process from campaign creation to fund disbursement. Incorporate feedback mechanisms and community engagement tools to foster a sense of transparency, trust, and accountability among users.

Conduct a thorough analysis of regulatory requirements and best practices governing crowdfunding platforms in relevant jurisdictions. Design robust compliance mechanisms to ensure adherence to securities laws, anti-money laundering regulations, investor protection standards, and other applicable legal frameworks. Collaborate with legal experts and regulatory authorities to stay abreast of regulatory developments and proactively address compliance issues. Explore opportunities to promote financial inclusion and democratize access to capital through crowdfunding. Develop strategies to reach underserved communities, including entrepreneurs, small businesses, and individuals with limited access to traditional financing sources. Provide educational resources and support services to empower users with the knowledge and skills needed to launch successful crowdfunding campaigns and manage funds responsibly. Leverage emerging technologies such as blockchain, smart contracts, and artificial intelligence to enhance the security, efficiency, and transparency of the crowdfunding platform. Explore the integration of decentralized finance (DeFi) principles to enable peer-to-peer lending, tokenization of assets, and other innovative fundraising mechanisms. Collaborate with technology partners and fintech startups to pilot new features and experiment with cutting-edge solutions that can drive innovation in the crowdfunding space.

Foster a vibrant and supportive community of creators, backers, and stakeholders through networking events, online forums, and social media engagement. Encourage collaboration, knowledge sharing, and mentorship opportunities to facilitate the growth and success of crowdfunding campaigns. Implement incentive programs, loyalty rewards, and gamification elements to incentivize user participation and foster a sense of belonging within the community.

##### Quality Assurance Mechanisms:

Develop robust quality assurance mechanisms to ensure the authenticity, viability, and transparency of projects listed on the platform. Implementing project vetting processes, verification checks, and risk assessment criteria to filter out low-quality or fraudulent campaigns. Provide tools and resources to help project creators optimize their campaigns, set realistic goals, and communicate effectively with backers.

##### Trust and Transparency Enhancements:

Introduce measures to enhance trust and transparency in crowdfunding transactions, including clear project descriptions, breakdowns of funding allocations, and real-time progress updates. Implement verification mechanisms for project milestones, achievements, and deliverables to instill confidence in backers and promote accountability among creators. Facilitate open communication channels, feedback mechanisms, and community engagement to foster a sense of transparency and accountability within the platform ecosystem.

##### Data Analytics and Predictive Modeling:

Leverage data analytics and predictive modeling techniques to analyze historical campaign data, identify trends, and forecast project success rates. Develop algorithms and models to assess the likelihood of project success based on various factors such as funding trajectory, project category, creator reputation, and market demand. Provide

actionable insights and recommendations to project creators to optimize their campaigns and increase their chances of success.

#### **Regulatory Compliance and Risk Management:**

Ensure compliance with relevant regulatory requirements, investor protection laws, and financial regulations in different jurisdictions. Implement robust risk management strategies to mitigate risks associated with fraud, default, and non-compliance with legal and regulatory obligations. Collaborate with regulatory authorities, legal experts, and industry stakeholders to stay updated on regulatory developments and adapt the platform's policies and procedures accordingly.

#### **Continuous Improvement and Innovation:**

Establish a culture of continuous improvement and innovation within the platform, with a focus on iterating on features, processes, and services based on user feedback and market trends. Invest in research and development initiatives to explore emerging technologies, business models, and best practices in crowdfunding and fintech. Collaborate with academic institutions, industry partners, and innovation hubs to drive innovation and explore new opportunities for growth and expansion.

## **V. IMPLEMENTATION**

#### **Frontend Development:**

**React:** A JavaScript library for building user interfaces, offering a component-based architecture and efficient rendering.

**Redux:** A predictable state container for managing application state, particularly useful for large-scale applications with complex data flows.

**React Router:** A routing library for React applications, enabling navigation and URL management.

**Bootstrap:** A front-end framework for building responsive and mobile-first websites, providing pre-designed components and CSS classes.

**React Helmet:** A React component for managing document head metadata, useful for dynamically updating title tags, meta descriptions, and other elements.

**React-Toastify:** A notification library for React applications, providing customizable toast notifications for user feedback.

**React-Stripe.js:** A React wrapper for Stripe.js, facilitating payment processing and integration with the Stripe payment gateway.

#### **Backend Development:**

**ASP.NET Core:** A cross-platform, open-source framework for building modern web applications and services using C#.

**C#:** A versatile and powerful programming language used for developing backend logic and business rules.

**Dapper:** A lightweight object-relational mapping (ORM) library for .NET, offering high-performance data access and query execution.

**Swagger:** A tool for documenting and testing APIs, providing a standardized interface for describing RESTful APIs.

**Serilog:** A logging library for .NET, offering structured logging capabilities and integration with various log sinks and storage providers.

**JWT Authentication:** JSON Web Tokens (JWT) will be used for secure user authentication and authorization, providing stateless authentication tokens.

#### **Database:**

**Microsoft SQL Server:** A relational database management system (RDBMS) for storing and managing project data, user profiles, investments, and transaction history.

**Entity Framework Core:** An ORM framework for .NET Core, providing a convenient way to interact with the database using object-oriented programming paradigms.

### Deployment and Hosting on Amazon Web Services (AWS):

**Amazon Web Services (AWS):** AWS is a comprehensive and widely-used cloud computing platform provided by Amazon.com. It offers a vast array of services for hosting, storage, networking, databases, analytics, machine learning, and more. AWS provides scalable, flexible, and cost-effective cloud solutions for businesses of all sizes, from startups to enterprises.

**Elastic Beanstalk:** Elastic Beanstalk is a platform-as-a-service (PaaS) offering from AWS that simplifies the deployment and management of web applications and services. With Elastic Beanstalk, developers can upload their application code, and Elastic Beanstalk automatically handles the deployment, provisioning, scaling, and monitoring of the underlying infrastructure. Elastic Beanstalk supports multiple programming languages and frameworks, including Java, .NET, Node.js, Python, Ruby, PHP, and Docker containers.

**RDS (Relational Database Service):** RDS is a managed database service provided by AWS for deploying, operating, and scaling relational databases in the cloud. RDS supports various database engines, including Amazon Aurora, PostgreSQL, MySQL, MariaDB, Oracle, and Microsoft SQL Server. With RDS, AWS manages database administration tasks such as hardware provisioning, database setup, patching, backups, and replication, allowing developers to focus on application development rather than infrastructure management. RDS provides high availability, scalability, and automated backups, making it an ideal choice for hosting relational databases in production environments.

**S3 (Simple Storage Service):** S3 is an object storage service provided by AWS for storing and retrieving static assets such as images, videos, documents, and application files. S3 offers highly durable, available, and scalable storage with virtually unlimited capacity. S3 supports features such as versioning, encryption, access control, lifecycle policies, and cross-region replication, making it suitable for a wide range of use cases, including static website hosting, data backup, content distribution, and application data storage. S3 can be integrated with other AWS services and third-party applications, providing seamless access to stored objects from various sources.

Workflow:

The typical workflow for a crowdfunding platform:

#### For Project Creators:

**Registration:** Sign up on the platform and create a profile.

**Campaign Creation:** Craft an engaging campaign page detailing the project, funding goal, timeline, and potential rewards.

**Campaign Review:** The platform may review the campaign to ensure it aligns with their guidelines before it goes live.

**Launch & Promotion:** Publish the campaign and actively promote it through various channels like social media and email marketing.

**Campaign Management:** Keep backers informed, address their questions, and provide updates throughout the campaign duration.

#### Funding Outcome:

**Successful Campaign:** If the funding goal is met within the specified timeframe, the platform collects the funds.

**Unsuccessful Campaign:** If the goal isn't reached, no funds are collected, and backers aren't charged.

**Fulfillment:** Deliver promised rewards (if applicable) to backers and utilize the funds for the project.

#### For Backers:

**Registration:** Create an account on the platform to explore and support campaigns.

**Campaign Discovery:** Browse through various projects to find ones that resonate with their interests.

**Contribution:** Choose a campaign and pledge a funding amount. Payment methods are typically integrated into the platform.

**Campaign Follow-Up:** Stay updated on the progress of supported projects to track their development.

#### For the Platform:

**Website Hosting:** Provide an intuitive platform for creators and backers to connect and collaborate.

**Campaign Oversight:** Review campaigns to ensure they comply with platform guidelines, safeguarding the interests of backers.

**Payment Processing:** Securely handle financial transactions between backers and creators, including transaction fees.

**Communication Tools:** Facilitate communication channels between creators and backers to foster engagement and transparency.

**Dispute Resolution:** Implement a system to address any disputes or issues that may arise during the crowdfunding process.

## VI.CONCLUSION

The conclusion of the crowdfunding project marks a significant achievement, highlighting the successful integration of advanced technologies and meticulous planning. Through a thorough analysis of the project's technical aspects and accomplishments, it's evident that the team's collective effort and dedication have resulted in the delivery of a robust and innovative crowdfunding platform.

From inception to deployment, the project journey has been characterized by meticulous attention to detail, strategic decision-making, and a commitment to excellence. Utilizing ASP.NET for backend development provided a solid foundation for implementing complex business logic, ensuring scalability, and enabling seamless integration with external services. Meanwhile, leveraging React for frontend development facilitated the creation of dynamic and engaging user interfaces, enhancing overall user experience and satisfaction.

The adoption of Amazon Web Services (AWS) for cloud hosting offered unparalleled scalability, reliability, and security, laying the groundwork for a resilient and high-performing infrastructure. By leveraging services such as Elastic Beanstalk, RDS, and S3, the project achieved optimal resource utilization, automated provisioning, and efficient data management. Additionally, robust security measures implemented at various layers, including encryption, authentication, and authorization, ensured the protection of user data against potential threats.

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