iJRASET
International Journal For Research in Applied Science and Engineering Technology



INTERNATIONAL JOURNAL FOR RESEARCH

IN APPLIED SCIENCE & ENGINEERING TECHNOLOGY

Volume: 13 **Issue:** IV **Month of publication:** April 2025

DOI: https://doi.org/10.22214/ijraset.2025.69591

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International Journal for Research in Applied Science & Engineering Technology (IJRASET)
ISSN: 2321-9653; IC Value: 45.98; SJ Impact Factor: 7.538
Volume 13 Issue IV Apr 2025- Available at www.ijraset.com

Sentiment-Driven Defense Donation System Using AI and Machine Learning Techniques

Sakshi Khandare[1], Siya Mishra[2], Shweta Pagrut[3], Divya Pendem[4], Vrushali Dharmale[5]
Computer Science &Engineering(Artificial Intelligence and Machine Learning) Department, Smt. Indira Gandhi College of Engineering, Ghansoli, India

Abstract: ***The National Defense Fund Initiative website serves as a centralized platform designed to facilitate contributions and support for the nation's defense and security forces. This initiative aims to provide financial assistance for the welfare of members of the Armed Forces, paramilitary forces, and their dependents, particularly those affected by conflict or disasters. The website features a user-friendly interface that allows citizens, organizations, and institutions to make donations, ensuring transparency in the use of funds and guaranteeing that every contribution is allocated to defense-related welfare programs and emergency needs. Furthermore, the platform provides real-time updates, success stories, and pertinent information about ongoing projects and their impact, thereby enhancing public engagement in national security and defense support efforts. Through this initiative, the website not only fosters a spirit of patriotism but also encourages a culture of collective responsibility towards the nation's defenders.***

I. INTRODUCTION

The Advanced Management and Oversight Enhancement for Defence Funding website is an online platform dedicated to supporting the welfare of India's defence personnel and their families. Established to provide financial assistance to the Armed Forces, paramilitary forces, and their dependents, the National Defence Fund (NDF) plays a crucial role in addressing both immediate and long-term needs arising from defence-related activities, including casualties, injuries, and natural disasters.

This website serves as a bridge between patriotic citizens, organizations, and the government by offering a convenient and transparent means to contribute to the welfare of the nation's defence forces. In light of growing security challenges and the increasing need for rapid response, the platform facilitates seamless donation processes, detailed tracking of contributions, and clear communication regarding the utilization of funds. By promoting inclusivity, the initiative empowers citizens and institutions to actively participate in strengthening the nation's defence resources.

Additionally, the website functions as a hub for information, showcasing the impact of contributions through stories of courage, resilience, and recovery, while providing updates on current initiatives and funding priorities. This approach enhances the sense of community and shared responsibility, ensuring that the sacrifices of defence personnel are acknowledged and supported by the nation they protect.

The primary objectives of the National Defence Fund (NDF) Initiative website are as follows:

1) Support for Defense Personnel Welfare

The website is designed to raise funds to enhance the welfare of Armed Forces, paramilitary forces, and their dependents, particularly those impacted by injuries, disabilities, or loss of life during their service.

2) Encourage Citizen Participation

By providing a transparent and accessible platform, the initiative invites citizens and organizations to contribute to the well-being of defense personnel, thereby fostering a sense of collective responsibility towards national security.

3) Ensure Transparency in Fund Utilization

The website is committed to maintaining transparency in the management and allocation of funds. Donors will receive real-time updates, reports, and impact stories, allowing them to monitor the usage of their contributions.

4) Promote Patriotism and Social Responsibility

The initiative aims to reinforce the connection between civilians and defense forces by promoting patriotism and social responsibility, highlighting the essential role citizens play in supporting the nation's protectors.

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II. LITERATURE REVIEW

Literature Survey: The Role of the National Defense Fund in Enhancing Military Capability**

The National Defense Fund (NDF) plays a significant supplementary role in bolstering a country's defense preparedness. While formal defense budgets are allocated through annual government planning, the NDF serves as a flexible financial channel that accepts voluntary contributions from individuals, corporate entities, and philanthropic organizations. Established to support both strategic defense requirements and the welfare of military personnel, the NDF has evolved into an asset for governments aiming to enhance military effectiveness. As global security challenges continue to evolve and defense needs become more dynamic, a comprehensive examination of the NDF's contribution to military capability is warranted. This literature survey synthesizes research, policy analyses, and government data to assess the fund's relevance, structure, and impact on the defense sector.

The structural framework of the National Defence Fund is typically governed by an executive authority, often chaired by a country's highest political office, such as the Prime Minister or Minister of Defense. The fund operates independently of the regular defense budget and relies on voluntary donations, often encouraged through tax incentives and national campaigns. Although designed to be flexible and responsive, the NDF is subject to limited public scrutiny. While its governance is top-down to ensure strategic alignment with national security goals, the absence of detailed operational disclosures often raises concerns about transparency and accountability. Nevertheless, the fundamental intent behind the fund is to serve as a national resource pool that can be swiftly mobilized for various defense-related expenditures.

A substantial body of literature supports the notion that the NDF contributes significantly to enhancing military capability. While the procurement of large-scale weapons systems and advanced combat technologies generally falls within the purview of the national defense budget, the NDF often addresses strategic gaps by funding smaller scale yet highly impactful acquisitions. Research has demonstrated that the fund is frequently utilized for the purchase of field equipment such as night-vision gear, protective clothing, and medical supplies. These items, though not headline-grabbing, play a crucial role in improving the effectiveness and safety of military personnel during operations. Additionally, the NDF has been associated with the development and maintenance of critical defense infrastructure, including housing, training centers, and rehabilitation facilities, all of which indirectly contribute to operational efficiency and force readiness.

One of the most prominent applications of the NDF is in the welfare of serving personnel and veterans. Literature on defense morale and retention emphasizes that the welfare programs financed by the fund—such as support for war widows, education for the children of deceased soldiers, and rehabilitation services for disabled veterans—enhance overall morale and loyalty within the armed forces. These programs help cultivate a resilient and committed force by ensuring that soldiers and their families feel supported by the nation they serve. While such welfare initiatives may not directly translate into combat capability, they exert a significant influence on the psychological and emotional readiness of the military.

Despite its strategic potential, several studies indicate that the NDF suffers from a lack of transparency and limited public accountability. Many scholars have criticized the infrequent publication of financial statements and the absence of independent audits. Without clear information on how the funds are collected, allocated, and spent, public confidence and donor participation remain low. This lack of transparency also creates opportunities for inefficiencies and political misuse, which further undermines the fund's purpose. Transparency is particularly crucial in encouraging voluntary contributions, as citizens and organizations are more likely to donate if assured that their funds are being utilized effectively.

Public engagement is another area where the NDF faces significant challenges. Research indicates that during times of national crisis—such as wars, natural disasters, or large-scale terrorist attacks—donations to the fund surge dramatically due to heightened patriotic sentiment. However, during normal times, the fund struggles to maintain consistent contribution levels. Factors such as a lack of awareness, the absence of a user-friendly digital platform, and minimal feedback mechanisms for donors significantly contribute to the decline in contributions. Scholars have proposed the adoption of modern technology, such as blockchain and online portals, to enhance transparency, track donations in real time, and build long-term donor trust.

When compared with global practices, countries such as the United States and Israel have more integrated and transparent defense funding models that include public contribution schemes. These countries routinely audit and publish fund reports, and their systems are often embedded within national defense strategies. In contrast, many developing nations treat such funds as symbolic rather than strategic tools, thereby missing opportunities for greater military and civic synergy. Lessons from these international models suggest that the successful implementation of a defense fund depends heavily on trust, governance, and integration with broader defense policies.In conclusion, the National Defence Fund represents a vital yet underutilized tool for enhancing military capability. While it cannot replace formal defense budgets, it can serve as a strategic complement—particularly in areas such as rapid acquisition, soldier welfare, and infrastructure development.

The current literature supports the view that the NDF has the potential to significantly contribute to national defense, provided that its governance mechanisms are modernized and made more transparent. Future efforts should focus on integrating technological solutions, strengthening donor confidence through accountability measures, and aligning fund objectives with long-term defense strategies. As military threats become increasingly asymmetric and unpredictable, a responsive and citizen-backed fund like the NDF could serve as a key instrument of national resilience and defense modernization.

III. PROBLEM STATEMENT

Defense funding is often characterized by complex procurement processes, limited transparency, and low public efforts. institution. This study examines the development of AI and machine learning-based donation and tracking systems for defense funding, including real-time mood analysis. By analyzing donor moods, the platform seeks to close emotional and beneficial gaps, improve donor trust, promote commitment, and support more transparent and socially responsive fund management in the defense sector.

IV. PROPOSED SYSTEM

The current platform offers a simple interface for user donations, but it lacks personalization, automation, and intelligent user interaction. The current donation and fund management processes are mostly done manually, resulting in operational inefficiencies and delayed updates. Donors are periodically informed about the progress of their contributions, but there is no system in place for immediate feedback or transparency. The current system is deficient in collaborative capabilities, hindering its ability to integrate with external entities or encourage user involvement.

In contrast, the advanced platform utilizes artificial intelligence and machine learning to tailor the donation experience, automate fund management, and conduct real-time analysis of donor feedback. This not only enhances trust and donor engagement but also enables users to monitor the emotional impact and trajectory of their contributions. The system enables collaboration with external stakeholders such as non-governmental organizations and government bodies, fostering transparency and accountability, and encouraging broader public involvement and responsible fund allocation.

A. Website Functionalities

1) User verification system.

- User registration and authentication: establish user identity and access.
- Email verification: guarantees the authenticity of the user before allowing access to restricted areas.
- Password reset: enables users to reset credentials via email.
- Session persistence: users stay logged in until they manually log out.

2) Smart giving platform with AI-powered features.

- Emotion-sensitive messaging: evaluates donor sentiments using AI-powered models.
- Personalized feedback: recommends suitable causes and presents empathetic thank-you messages.
- Real-time confirmation: shows the success of a donation and provides emotional insights on the same page.
- Secure digital payments: facilitates the integration of secure payment gateways such as razorpay or upi.

3) Donation Tracking in Real-time.

- This page displays the past accomplishments and current visual representations.
- Live updates: provides real-time information on user engagement and recent contributions through a visual representation using graphs.
- Sentiment analysis: presents emotional analytics based on donor messages.

4) Chatbot Integration.

- Live chatbot: facilitates instant dialogue and assistance.
- Custom design: fashionable user interface featuring trademarked symbols and placement.
- Multifunctional: able to provide FAQs, track donations, and explain features.
- Database-ready: constructed to connect with firestore for real-time responses.

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5) Captivating and visually appealing frontend pages.

- Homepage (index.html): greets visitors and describes the goal.
- The About page (about.Html) provides an overview of the organization's mission, vision, and the importance of implementing advanced oversight in defense funding.
- Track page (track.html): showcases the impact of donations, displays the emotions of donors, and includes interactive profiles of soldiers.
- The donate page (donate.html) offers a clean and enhanced donation interface.

6) Interactive visual features.

- Animations: increase interaction with transitions and visual prompts.
- Flip cards: present soldier or mission details in an engaging and informative manner.

7) Firebase Firestore Integration.

- User information repository: stores comprehensive user data and opinions.
- Donation record keeping: keeps track of all donor activities, messages, and analysis results.

B. System Benefits

1) Openness – live donation tracking and visual representation of impact.
2) Ai trust layer – emotion detection guarantees personalized, human-like feedback.
3) Quick understanding – instant approval and emotional feedback.
4) Interactive ux – chatbots, animations, and flip cards are used to increase engagement.
5) An emotion-aware system – comprehends donor sentiments by utilizing artificial intelligence sentiment analysis.
6) Future-proof – constructed with Firebase, adaptable and compatibility-friendly.

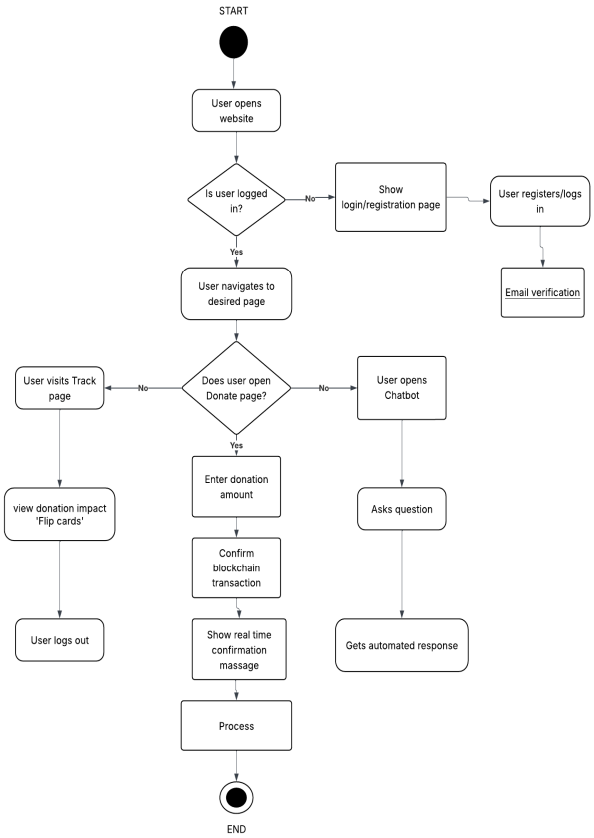


Fig 1 :Activity Diagram

V. IMPLEMENTATION

The defense donation fund website is a comprehensive web application built using advanced technologies, including firebase backend services, modern frontend technologies, and artificial intelligence, to create a secure, transparent, and emotionally intelligent platform for supporting national defense initiatives.

A. Backend development.

The website's design is created using HTML, CSS, and JavaScript, providing a sleek, adaptable, and captivating user interface.
The frontend components consist of:
Engaging UI components.
Flip cards showcasing soldiers or missions.
A tailored conversational agent that improves engagement and customer assistance.

B. User verification.

Firebase authentication is responsible for powering user identity and session management.
Main Attributes:
Access Registration and Login.
Email confirmation to enable accounts.
Password reset via email.
Session persistence with firestore-based user role management, such as donor or admin, is a feature that allows for the storage and retrieval of user information.

C. AI-driven contribution platform.

- The donation platform gathers donor information and assesses their emotional state by utilizing an integrated hugging face emotion detection model. Features include:
- Tailored Comments on Donor Feelings.
- Real-time validation and presentation of contribution achievement.
- Emotion and message storage for future engagement analytics.

D. In-depth monitoring and graphical representation.

- A committed page showcases:
- Financial Contributions and Patterns
- Experiencing-based analytics.
- Visuals and diagrams of donor involvement.

Donation records are securely stored in a firestore and can be easily viewed for transparency and internal tracking purposes. Emotional insights are shared for donor recognition and system feedback loops.

E. Chatbot Integration.

- A real, adaptable chatbot enables:
- Addressing Frequently Asked Questions from Potential Donors.
- Navigating users through the platform.
- Updating Donor Status in Real-Time.
- Created to facilitate future backend connection with dynamic data.

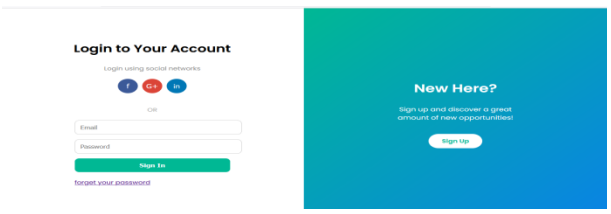


Fig.1.<< Add Login Screenshot>>

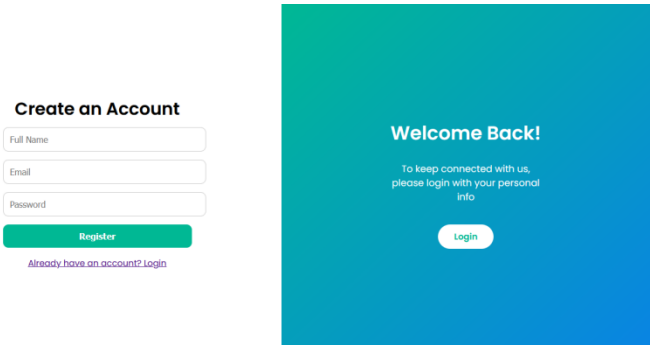


Fig 2. << Add Register Screenshot>>

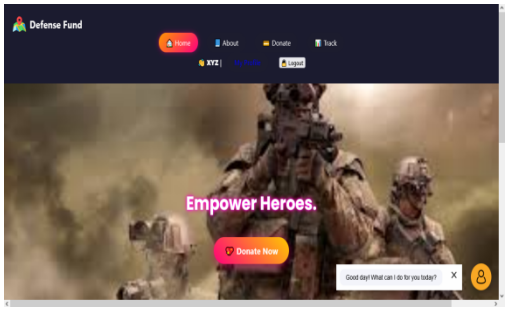


Fig.3.<< Add Home Screenshot >>

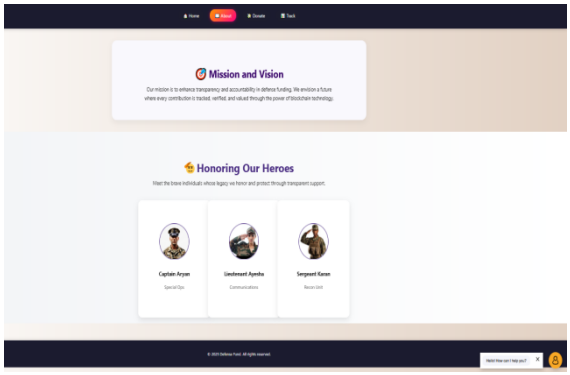


Fig.4.<< about Screenshot>>

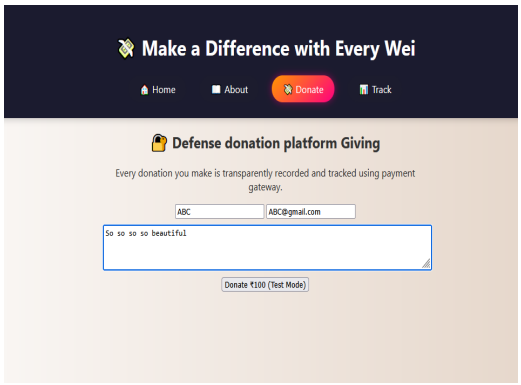


Fig. 5 <<donate screenshot>>

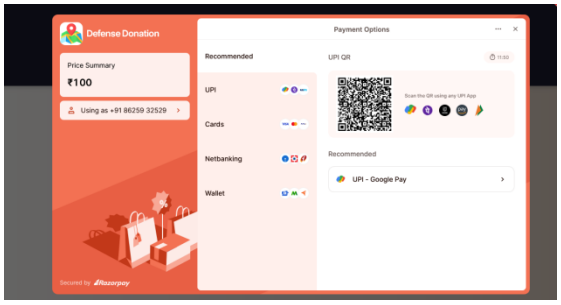


Fig 6 <<Payment Gateway>>

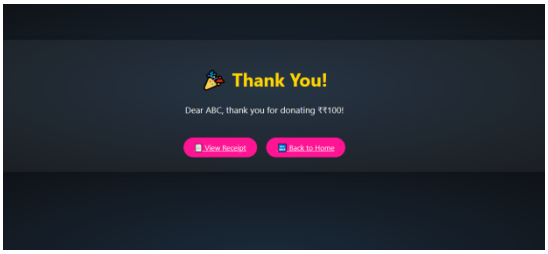


Fig 7 <<Thank you Screenshot>>

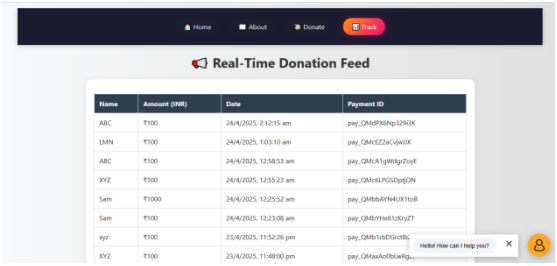


Fig 8 <<Tracking Screenshot>>

VI. CONCLUSION

The defense donation website utilizes advanced web technologies, such as firebase and artificial intelligence, to establish a secure, transparent, and emotionally engaging platform for public contributions to national defense. By integrating artificial intelligence-driven sentiment analysis, the platform customizes the donation experience, offering real-time feedback to build trust and emotional connection between donors and the cause.

Firebase services provide robust user management, secure authentication, and scalable real-time data storage. The interactive frontend, with its animated elements, flip cards, and live chatbot, greatly improves accessibility and user engagement across various devices.

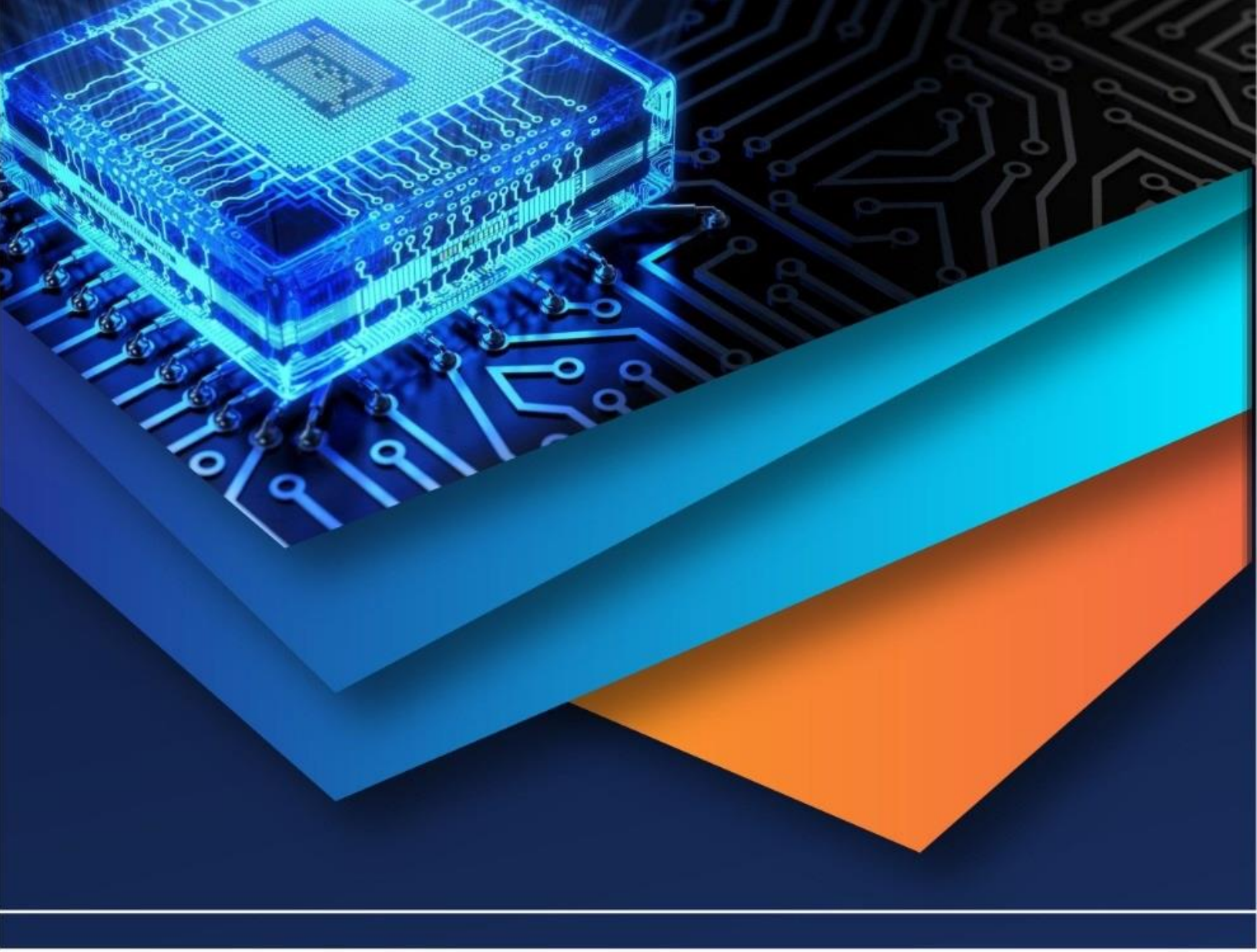
This effort not only encourages citizen involvement but also tackles persistent issues concerning the openness and accountability of public funding for defense purposes. It provides a flexible and adaptable framework for public-sector digital infrastructure, with potential for further development into real-time analytics, user-friendly dashboards, and advanced artificial intelligence-based personalization. In summary, the website provides a valuable and groundbreaking approach to enhancing trust and accountability in defense donations by leveraging advanced digital technology.

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