iJRASET
International Journal For Research in Applied Science and Engineering Technology



INTERNATIONAL JOURNAL FOR RESEARCH

IN APPLIED SCIENCE & ENGINEERING TECHNOLOGY

Volume: 14 **Issue:** IV **Month of publication:** April 2026

DOI: https://doi.org/10.22214/ijraset.2026.79928

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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 14 Issue IV Apr 2026- Available at www.ijraset.com

Niswartha: A Smart Beginning for Growing Smile

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Abstract: ***Orphanages play a vital role in providing care, shelter, and support for children without parental guidance. Despite the willingness of many individuals to contribute to orphanage welfare, donors often lack clear information about the specific needs of these institutions. This gap frequently leads to unstructured donations or resource mis- matches, where the provided support does not align with the actual requirements of the orphanage. To address this challenge, this research proposes Niswartha: Smart Be- ginning for Growing Smile, a mobile-based platform designed to connect donors with orphanages through a structured requirement-based donation system. The proposed system allows orphanage administrators to update their real-time requirements such as food items, clothing, books, educational materials, and other daily necessities. Donors can browse these needs through the application and contribute by fulfilling the exact requirements listed. In addition to requirement-based contributions, the system introduces a celebration-driven engagement model, where individuals can dedicate personal occasions such as birthdays, anniversaries, or festivals to support orphanage children. Further- more, the platform includes a slot booking feature, which allows donors to schedule visits to orphanages for celebrations or donation activities, ensuring better coordination and avoiding overcrowding or scheduling conflicts. By integrating requirement visibility, celebration-based contributions, and structured visit scheduling, the proposed platform promotes transparency, efficient resource distribution, and meaningful community engagement. The system aims to strengthen the connection between donors and orphan- ages while ensuring that contributions directly address the real needs of the children, ultimately supporting sustainable and organized welfare initiatives.***

Keywords: ***Requirement-based Donation, Orphanage Support System, Mobile Ap- plication, Slot Booking, Social Welfare Platform, Digital Donation System.***

I. INTRODUCTION

The growth of digital technologies has significantly transformed the way individuals participate in social welfare activities. Mobile applications and online platforms have made it easier for people to contribute to charitable causes without geographical limitations. Many digital donation platforms have been developed to support non-profit organizations and vulnerable communities by facilitating monetary contributions and fundraising campaigns. However, despite these advancements, the process of donating resources to orphanages often remains unstructured and inefficient due to the lack of transparency and clear communication regarding their actual requirements [1].

Orphanages play an essential role in providing shelter, education, and emotional support to children who lack parental care. These institutions depend heavily on public contributions, volunteers, and charitable organizations to sustain their operations. While many individuals are willing to provide support, donors frequently face difficulties in identifying the exact needs of orphanages. As a result, donations may not always match the requirements of the institution, leading to resource imbalance where some items are over-supplied while other essential needs remain unfulfilled [2].

Existing digital donation platforms primarily focus on monetary donations and crowdfunding cam- paigns. While these systems successfully connect donors with social causes, they often lack mechanisms to provide real-time visibility of specific institutional requirements. In many cases, donors contribute
funds without knowing how their contributions are utilized or whether the support directly addresses the needs of the beneficiaries. This lack of requirement-based transparency reduces the efficiency and impact of charitable contributions [3].

Recent research has emphasized the importance of need-driven resource allocation in social welfare systems. Requirement-based donation platforms can improve the effectiveness of charitable contribu- tions by allowing organizations to clearly communicate their needs to potential donors. Such systems help ensure that resources are allocated based on demand rather than assumptions, thereby minimizing wastage and improving the distribution of essential supplies [4].

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Another important aspect of community engagement in charitable activities is emotional motivation. Individuals are often motivated to perform acts of kindness during personal milestones such as birth- days, anniversaries, or festivals. However, traditional donation platforms rarely integrate these emotional triggers into structured charitable activities. Providing a digital platform that enables individuals to cel- ebrate personal occasions through meaningful contributions can significantly increase social participation and promote a culture of responsible giving [5].

In addition to requirement-based donation, effective coordination between donors and orphanage administrators is essential for managing visits, celebrations, and donation activities. Without proper scheduling, orphanages may face issues such as overcrowding or multiple donors visiting simultaneously. Integrating a slot booking mechanism within a donation platform can help organize such visits efficiently while maintaining a comfortable environment for both children and visitors [6].

To address these challenges, this research proposes Niswartha: Smart Beginning for Growing Smile, a mobile-based platform designed to bridge the gap between donors and orphanages through a structured requirement-based donation system. The application enables orphanage administrators to update their real-time needs, allowing donors to contribute by fulfilling those specific requirements. The system also introduces a celebration-driven contribution model that encourages individuals to dedicate their special occasions to the welfare of orphanage children.

Furthermore, the proposed platform incorporates a slot booking feature that allows donors to schedule visits for celebrations or donation activities in advance. By combining requirement visibility, emotional engagement, and structured scheduling, the proposed system aims to create a transparent and efficient donation ecosystem that benefits both donors and orphanage communities. The implementation of such a system has the potential to strengthen community participation, reduce resource mismatch, and enhance the overall effectiveness of social welfare initiatives.

II. REVIEW OF LITERATURE

The literature on digital social welfare and orphanage support systems has evolved from basic informa-tional portals to more complex, data-driven ecosystems, yet several critical gaps remain in the current research landscape. Early foundational work, such as the "App for Orphan" by Joshi et al. (2023), established the necessity of using mobile platforms for adoption awareness and general donations using native Android tools, but these systems were often passive, lacking the real-time synchronization required to prevent resource clustering or over-donation of specific items. This logistical challenge was further explored by Yaswanth et al. (2023) and Biswas et al. (2024), where the former identified a lack of need-based prioritization in Firebase-backed applications and the latter attempted to use Machine Learning to optimize food distribution; however, these solutions remained highly specialized or lacked a comprehensive approach to non-perishable daily necessities.

The shift toward cross-platform efficiency seen in the work of Sarvade and Uphale (2025) and Pandey et al. (2024) demonstrated that Flutter-based architectures could improve transparency and unite multiple NGOs under one digital roof, yet these platforms continued to treat donations as purely financial or material transactions, failing to incorporate the emotional and social milestones of the donor community. Furthermore, while theoretical models by Raza Khan and Jha (2024) suggested that requirement-to-donor mapping is the primary hurdle in modern philanthropy, and usability studies by Ohol et al. (2024) emphasized the need for secure payment integration, the actual implementation of a dual-purpose system that manages both in- ventory and physical visit coordination remained absent. Even modern web-based safeguarding platforms like "OrphanAssist" by Magar et al. (2025) focus more on protection and reporting rather than the granular, celebration-driven engagement and slot-booking mechanisms that define the Niswartha plat- form. Consequently, the existing body of literature reveals a significant research void regarding "active" coordination models that transition orphanages from silent recipients to active requesters, highlighting a clear need for a unified ecosystem that merges institutional inventory needs with the social and emotional milestones of the donor public.

III. PROBLEM STATEMENT

Orphanages rely on public donations for basic resources. Although many people are willing to help, donors often do not know what items are actually required. Because of this lack of communication, donations become unorganized and may not meet real needs. Most existing platforms support monetary donations but do not display current requirements or manage celebration-based visits. Therefore, there is a need for a platform that enables understanding real-time requirements and organized visits through a slot booking mechanism.

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IV. PROPOSED METHODOLOGY

The proposed system, Niswartha, is developed as a mobile-based application that facilitates requirement- based donation through a structured and transparent framework. The methodology follows a modular architecture where each module is responsible for a specific functionality, ensuring efficient system per- formance and scalability.

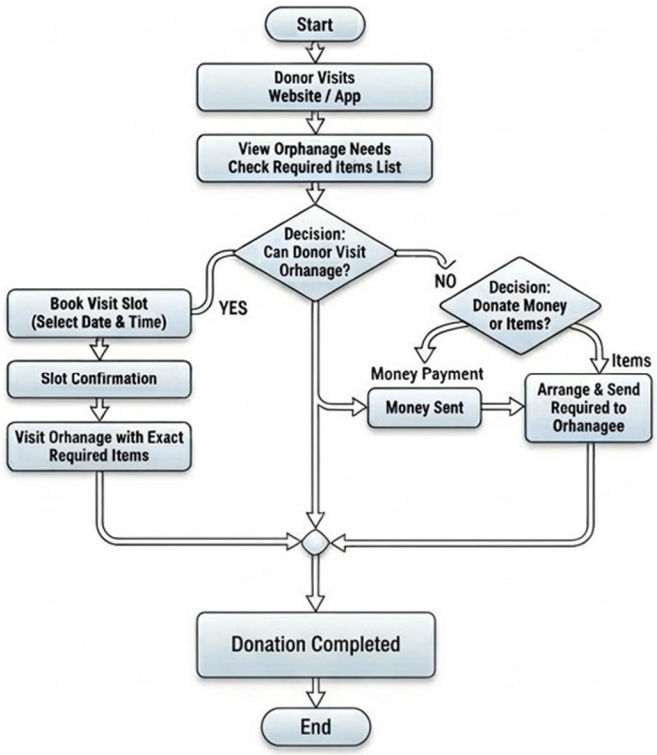


Figure 1: Proposed System Flowchart for the Niswartha Platform

A. User Registration and Authentication Module

This module is responsible for managing user access to the system. Both donors and orphanage admin- istrators must register by providing basic details such as name, email, and contact information. Secure authentication mechanisms are implemented to validate user identity and ensure data privacy. Upon successful login, users are redirected to role-specific dashboards, allowing them to access relevant features of the system.

B. Orphanage Management Module

The orphanage management module enables administrators to create and maintain detailed profiles of their organizations. This includes information such as location, contact details, number of children, and available facilities. This module enhances transparency and helps donors make informed decisions by providing a clear understanding of the orphanage's background and requirements.

C. Requirement Management Module

This is a core component of the system that allows orphanage administrators to add, update, and manage their real-time requirements. These requirements may include essential items such as food, clothing, books, medical supplies, and daily necessities. The system categorizes these requirements based on priority, quantity, and urgency. Once a donor fulfills a requirement, the system automatically updates the database to reflect the current status, thereby avoiding

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duplication and ensuring accuracy.

D. Donor Interaction Module

The donor interaction module provides an intuitive interface for donors to explore orphanages and view their current requirements. Donors can filter and select orphanages based on location or type of need. The system enables donors to choose specific items for donation, ensuring that contributions are aligned with actual requirements. This module plays a significant role in improving user engagement and simplifying the donation process.

E. Celebration-Based Contribution Module

This module introduces an innovative approach by allowing donors to associate their contributions with personal events such as birthdays, anniversaries, and festivals. Donors can dedicate their donations to these occasions and optionally include personalized messages. This feature enhances emotional involve- ment and motivates users to contribute more actively to social causes, thereby increasing the overall impact of the system.

F. Slot Booking and Scheduling Module

The slot booking module enables donors to schedule visits to orphanages for donation or celebration purposes. Donors can view available dates and time slots and make bookings accordingly. Orphanage administrators have the authority to approve, reject, or reschedule these bookings. This module en- sures proper coordination, prevents overcrowding, and maintains a structured environment within the orphanage during visits.

G. Donation Processing Module

This module manages the end-to-end donation workflow. Donors can choose to contribute either by directly providing items or by using online purchasing options integrated within the system. The module records all donation activities, updates requirement status in real time, and maintains a transaction history for accountability. This ensures transparency and builds trust between donors and orphanage administrators.

H. Real-Time Data Management and Notification Module

The system is supported by a real-time data management mechanism that ensures instant synchroniza- tion of information across all modules. Any updates related to requirements, donations, or bookings are immediately reflected in the system. Additionally, the notification system alerts users about impor- tant events such as new requirements, successful donations, and booking confirmations. This improves communication and enhances the overall user experience.

V. SYSTEM ANALYSIS AND MODELING

The functional requirements of the Niswartha platform are modeled using a UML Use Case Diagram to define the boundaries of the system and the specific interactions between internal and external entities.

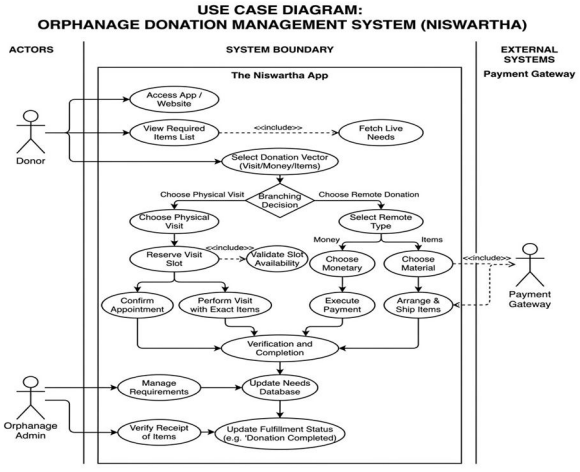


Figure 2: UML Use Case Diagram for the Niswartha Orphanage Donation Management System

A. Use Case Analysis

The functional requirements of the Niswartha platform are modeled using a UML Use Case Diagram to define the boundaries of the system and the specific interactions between internal and external enti- ties. This modeling approach ensures that all user requirements are translated into actionable system functions.

The system involves three primary actors:

1) Donor: The primary end-user who provides resources.
2) Orphanage Admin: The stakeholder responsible for managing institutional requirements.
3) Payment Gateway: An external system actor that facilitates secure financial transactions.

B. Functional Decomposition

As illustrated in Figure [Insert Figure Number], the system logic is categorized into several high-level functional blocks:

1) Requirement Discovery: The process begins with the "View Required Items List" use case. This function includes a "Fetch Live Needs" dependency, ensuring that the donor is presented with real-time, verified data from the orphanage's inventory database. This mechanism is critical for preventing the delivery of redundant or low-priority resources.
2) Donation Vector Selection: The system provides a "Branching Decision" point where the donor selects their preferred contribution method.

C. Summary of System Boundaries

By isolating these use cases within the Niswartha App boundary, the architecture maintains a clear separation between user input, external payment processing, and administrative oversight. This structure supports a transparent and highly organized donation ecosystem, addressing the core problem of information asymmetry in social welfare.

VI. RESULTS AND DISCUSSION

The proposed system, Niswartha: Smart Beginning for Growing Smile, was designed and implemented to evaluate the effectiveness of a requirement-based donation platform for orphanages. The system was tested with sample data to simulate real-world scenarios involving orphanage administrators and donors. The results demonstrate that the platform successfully enables orphanages to list their real-time needs and allows donors to respond to those requirements efficiently. The implementation shows that the requirement management module effectively maintains up- dated lists of essential items. When a donor fulfills a requirement, the system automatically updates the database, reducing duplication and ensuring accurate information. This confirms that the proposed approach minimizes resource wastage compared to traditional donation methods where contributions are often unplanned.

The donor interaction module provides a user-friendly interface that simplifies the process of browsing orphanages and selecting items for donation. During testing, it was observed that users were able to easily understand and navigate the system, indicating good usability and accessibility. This enhances user participation and encourages more structured contributions. The inclusion of the slot booking feature proved beneficial in managing donor visits. It helped maintain proper scheduling and avoided overcrowding at orphanages. Administrators were able to control and approve visits efficiently, ensuring better coordination and organization.

Furthermore, the celebration-based donation feature increased user engagement by allowing donors to associate their contributions with personal occasions. This approach adds emotional value to the donation process and promotes consistent participation in social activities.

The system's real-time data handling capability ensures that all updates related to requirements, donations, and bookings are reflected instantly. This improves transparency and builds trust between donors and orphanage administrators. Notifications further enhance communication by keeping users informed about important activities within the system.

However, some limitations were identified during testing. The system currently depends on accurate input from orphanage administrators, and any delay in updating requirements may affect efficiency. Additionally, integration with external delivery services and secure payment gateways can further improve the system's functionality in future implementations. In conclusion, the results indicate that the proposed system effectively addresses the challenges of traditional donation methods by providing a structured, transparent, and user-friendly platform. The discussion highlights that the integration of real-time updates, requirement-based donation, and scheduling features significantly improves the overall donation process and ensures better resource utilization.

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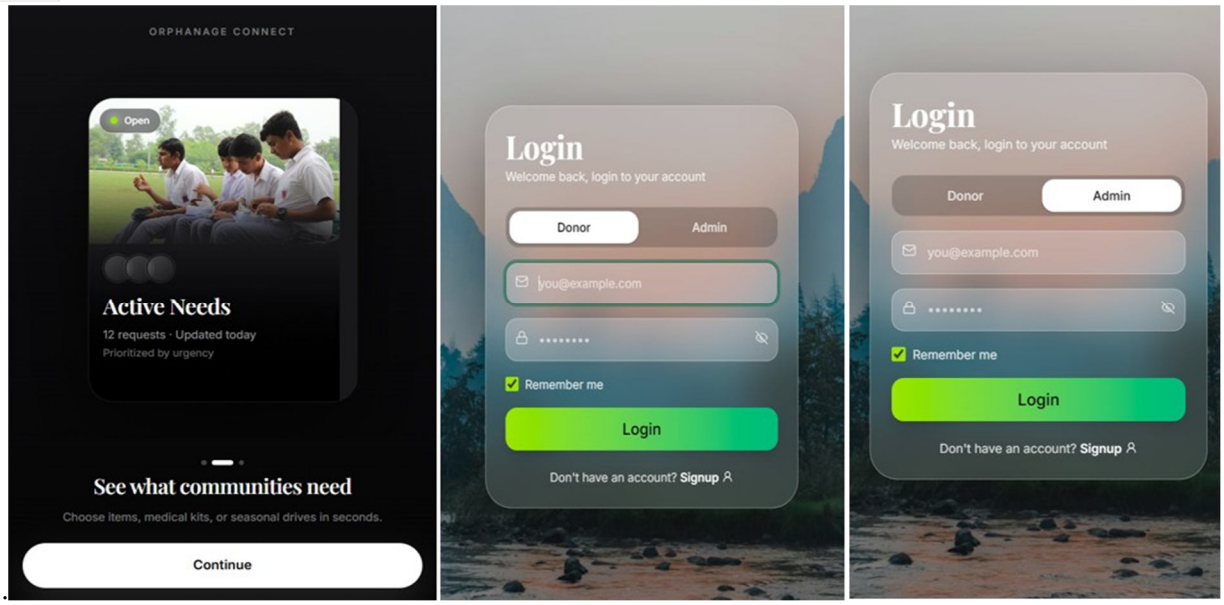


Figure 3: Landing Page

This image shows the UI design of an Orphanage Connect app.

- Left screen: Displays active needs of orphanages (like requests for help or items).
- Middle & Right screens: Show a login page where users (Donor/Admin) can enter email and password to access the system.

Overall, it represents a platform connecting donors with orphanage needs in a simple and user-friendly way.

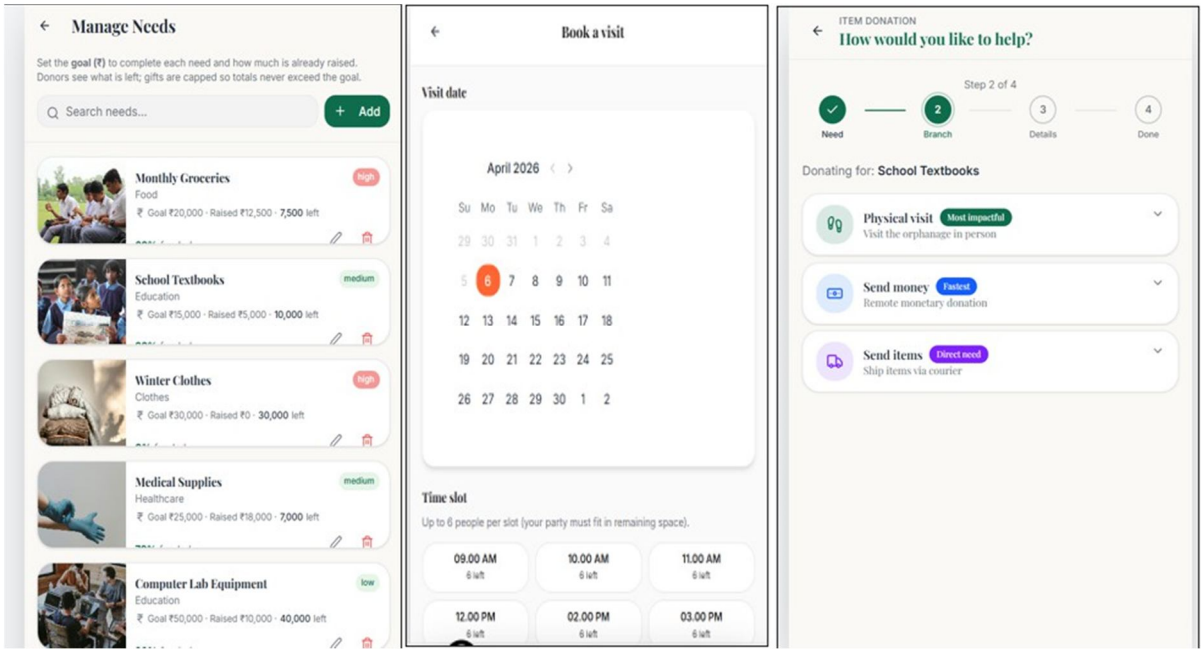


Figure 4: Requirement, Slot Booking, Way of Visit

VII. CONCLUSION

This paper presented Niswartha: Smart Beginning for Growing Smile, a requirement-based donation platform designed to improve the efficiency and transparency of contributions made to orphanages. The proposed system addresses the limitations of existing donation methods by enabling orphanages to share their real-time needs and allowing donors to contribute accordingly. By focusing on need-based donations, the system ensures that resources are utilized effectively and reach the right beneficiaries.

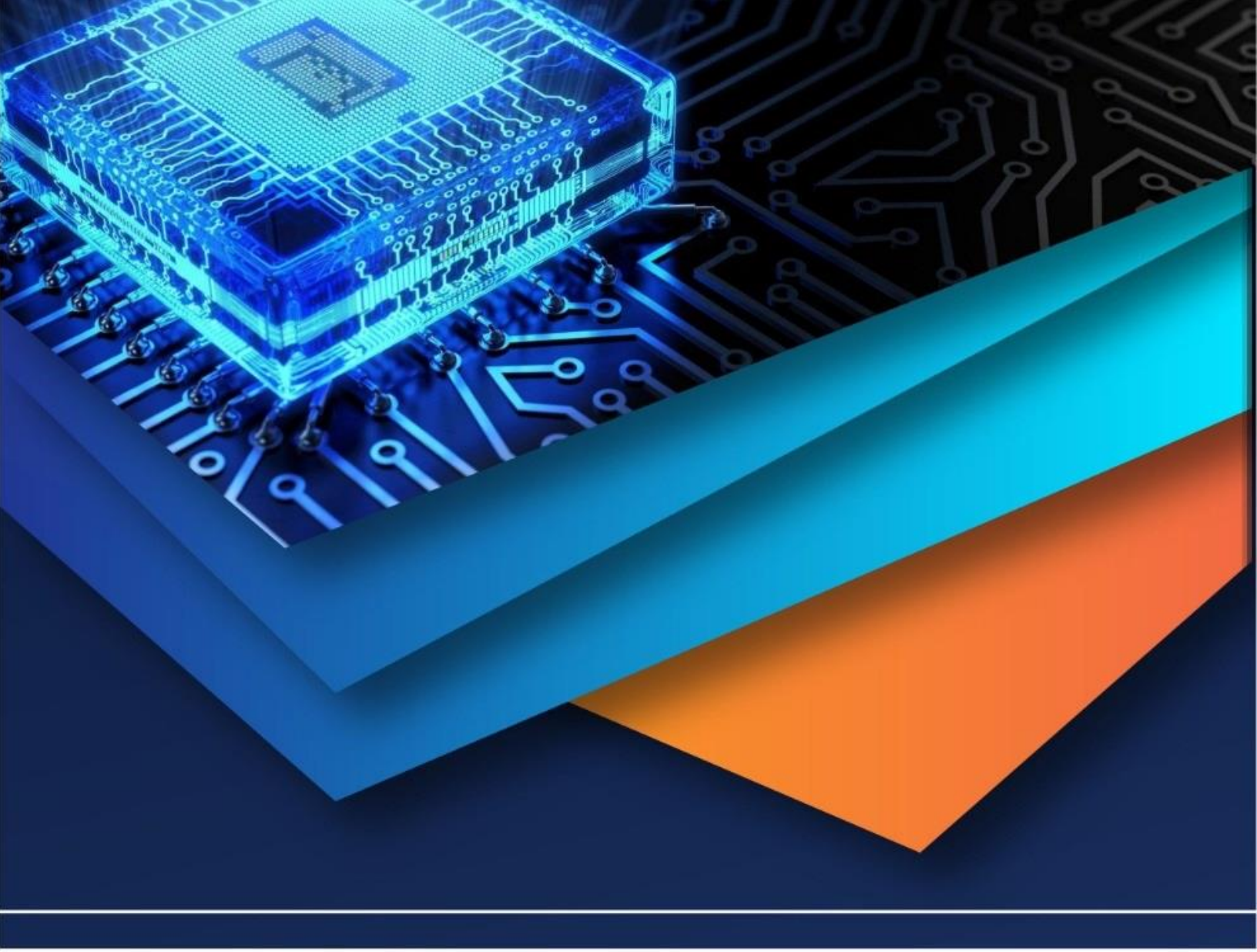
The integration of features such as real-time requirement updates, celebration-based contributions, and slot booking for visits enhances user engagement and promotes structured interaction between donors and orphanage administrators. The modular design of the system supports better coordination, reduces resource mismatch, and simplifies the overall donation process.
Overall, the proposed solution provides a practical and scalable approach to bridge the gap between donors and orphanages. It not only improves transparency and trust but also encourages meaningful participation in social welfare activities. The system has the potential to create a positive social impact by ensuring that donations are aligned with actual needs and delivered in an organized manner.

VIII. FUTURE SCOPE

The proposed system Niswartha can be further enhanced by integrating advanced technologies such as AI-based recommendation systems to suggest relevant donations based on orphanage needs and donor preferences. The inclusion of a secure online payment gateway and multi-factor authentication will improve transaction safety and data security. Additionally, features like real-time notifications, GPS-based location tracking, and logistics support for item delivery can make the donation process more efficient and user-friendly. Expanding the platform to support multiple NGOs and social organizations will increase its scalability and impact. Furthermore, incorporating multilingual support and a mobile application version can improve accessibility and reach a wider audience, making the system more effective in real-world deployment

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