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GIVING CHAIN-DONATIONS HUB

Samba Siva Rao M
Associate professor
Usha Rama College Of Engineering And Technology
Telaprolu,AP, India
sambasivarao@usharama.in

Kolleti Madhura Venkata Rama Krishna
UG Student in
Usha Rama College Of Engineering And Technology
Telaprolu,AP, India
ramakrishnakolleti16@gmail.com

Kolla Chakradhar
UG Student in
Usha Rama College Of Engineering And Technology
Telaprolu,AP, India
kollachakradhar1380@gmail.com

Thota Sai Kavya
UG Student in
Usha Rama College Of Engineering And Technology
Telaprolu,AP, India
thotasaikavya@gmail.com

N.Raghavendra Babu
UG Student in
Usha Rama College Of Engineering And Technology
Telaprolu,AP, India
nalliboinaraghavendra621@gmail.com

Abstract— ***A complete web-based Donation Tracking System called the Giving Chain was developed using the Java Full Stack. This system was available for use. Its design aims to simplify the process of managing, monitoring, and tracking donations for organizations, including charities (known as nonprofits). Enhanced transparency, accountability and user-friendliness facilitate donations and improve administrative efficiency. By utilizing the platform, donations can be processed quickly and frequently online while being updated on impact.***

Donors will find that this system has a user-friendly interface that allows them to register, securely donate and track their donation history. The organization of financial information is made easier by its ability to organize and adjust the expenditure process. The integration of automated reporting and analytics enables administrators to synthesize financial data, monitor trends in donors over time, and use the information to make appropriate decisions about resource allocation.

The system mandates the verification of donations by an NGO using a government-issued Darpan ID and certification. The. This regulation limits donations to organizations that have evidence of the organization's involvement, which helps to reduce the risk of fraud and promote greater accountability for charitable giving. Authenticity in the validation of contributions gives donors confidence in their donations being used for legitimate causes.'".

The Java Spring Boot backend is designed with strong business logic and secure APIs to handle donations securely.. Securely stored in a MySQL database are records of donor information, transaction records and fund allocations.[]. Utilizing modern frameworks such as HTML, CSS, Bootstrap, and JavaScript, the front-end is designed to be responsive and user-friendly across different devices.

By utilizing real-time reporting and analytics, the system ensures that financial integrity remains intact and organizations can gain insight into donor engagement and fund distribution. The utilization of these reports enables the auditing, decision-making, and strategic planning process, which ultimately results in greater donation usage. Additionally, Charities can improve their accountability and compliance with regulations through the use of individual financial reporting.

Giving Chain automates traditional donation processes to provide a more transparent and reliable way of overseeing donations. Through the platform, donors can engage with organizations directly by transferring funds to worthwhile causes. By utilizing the system, small charities and large non-profit organizations can update their donation tracking systems and encourage ethical fundraising.

Keywords— Donation Tracking, Non-Profit Management, Charity Transparency, Fund Allocation, Donor Management, Online Donations, NGO Validation, Darpan ID Verification, Financial Reporting, Java Full Stack, Spring Boot, Html, Css, Bootstrao, Javascript, MySQL Database, Real-Time Analytics, Secure Transactions, Automated Fund Management, Accountability in Donations, User-Friendly Interface, Financial Compliance, Ethical Fundraising.

I. INTRODUCTION

In Internationally, donations are important to the support of many non-profit organizations, charities and humanitarian groups. Yet many conventional donation management systems are not transparent, nor efficient or allow real time tracking and the result is often a donor wart, and difficult administrative work. Many organizations face challenges with manual record-keeping, delayed financial reporting, and the lack of accountability to ensure funds are allocated appropriately. In order to overcome these problems, the Giving Chain Donation Tracking System has been developed

as a digitally-integrated and automated platform for managing charitable donations.

Using Java FullStack technologies, The Giving Chain provides a complete end-to-end donation management system that makes it easy for both donors and administrators to make their donations. The interface is user-friendly, allowing donors to make contributions without difficulty and ensuring that organizations can track and allocate funds efficiently. The system's real-time analytics and reporting ensure transparency, recording and monitoring ensures every transaction is monitored.

The landscape of donations is marked by a significant issue of trust. A significant number of donors do not contribute due to concerns about fraud, mismanagement, or lack of transparency regarding the use of their funds. The Giving Chain NGO verification process is rigorous, with government-registered Darpan ID and certification being used to mitigate these issues. Only verified organizations can receive donations, which increases the credibility of donors and encourages more individuals to contribute.

The system includes a sophisticated donor management feature that permits users to create accounts, monitor their donation history, and receive notifications about the results of their contributions. Besides improving donor engagement, this feature also facilitates a seamless and rewarding experience for donors. Nevertheless, businesses can group funds, allocate resources more efficiently, and produce comprehensive financial statements for compliance and strategic consideration.

Its core architecture is based on Java Spring Boot, a powerful backend framework for secure and scalable data processing. The front-end is designed to be both user-friendly and responsive on different devices, using Angular/React as the foundation. It uses MySQL as an example of efficient data storage, ensuring that donor and transaction information is stored securely (both locally and retrievably) and are accessible when needed.

The Giving Chain benefits from the inclusion of real-time analytics.' The integration of data visualization and automated reporting enables organizations to obtain information on donor behavior, funding patterns, and financial trends. It empowers charities to enhance their fundraising methods, manage resources more efficiently, and ensure that funds are allocated to worthwhile causes. Moreover,

The emergence of digital transactions has made it crucial to prioritize security. Secure payment gateways into the system so that any and all financial dealings are encrypted to. Also, robust authentication measures aid in securing user accounts to prevent unauthorised access and maintain the confidentiality of donor data.

Instead of manual processes and paperwork, giving chains offer a workflow that is fully automated. Why? It cuts down on overheads, reduce blunders and speeds up whole donation cycle. NGOs can automate various tasks, including donor verification, fund allocation, and financial reporting to focus on their core mission rather than administrative work.

The platform's scalability is another significant benefit. Its flexibility in architecture allows the system to be used by a wide range of organisations, from small charities to large international NGO's, to manage volumes of donations efficiently. With its modular architecture, it is easy to upgrade and integrate the platform with any application while keeping up with changing technological and operational needs.

Environmental sustainability is positively impacted by the system's ability to digitize donation tracking. Inefficient paper-based record-keeping leads to unnecessary resource usage. Why?... The elimination of physical documentation through Giving Chain promotes environmental sustainability in donation management and enhances the accessibility of all stakeholders.

Additionally, the platform enhances donor engagement by providing customized notifications, acknowledgement messages, and impact reports. The ability to monitor the utilization of donated funds allows donors to have more assurance about their contributions' long-term sustainability. Transparency is beneficial for fostering a sense of community and accountability among charities and their supporters.

Compliance with legal and financial reporting standards, the system ensures. NGO's can produce audit-ready reports, simplify the tax filing process, and provide verifiable financial records for external stakeholders. Companies can now attract corporate sponsorships and significant funding from institutions that require transparent financial statements.

As digital philanthropy becomes more prevalent, it is crucial to have a secure and efficient donation tracking system. Giving Chain facilitates the communication between donors and organizations, resulting in a donation ecosystem that is both transparent and organized. With the latest technology, charities can make the most of their impact while also ensuring that their donations are being used efficiently.

The Giving Chain Donation Tracking System is a revolutionary approach to managing donations in the present day. The integration of security, transparency, and automation enables donors to donate securely while maintaining proper tracking and allocation of funds. It is a reliable, scalable and efficient platform for individual donors, charitable organizations or regulatory bodies to enhance the entire giving experience.'

II LITERATURE REVIEW

STACK Technological developments have facilitated greater transparency and efficiency in the process of managing donations over time. Conventional methods involved manual record-keeping and offline fundraising events, which made it difficult to keep track of donations and maintain recollection. A recent study has emphasized the importance of automated systems that offer real-time tracking

and secure transactions, which can help reduce fraud and mismanagement.

Digitized donation systems have gained popularity because they provide a simplified and secure user interface for donors to use. Smith et al. (2018) found that charities can use digital platforms to reduce administrative costs and focus more resources on their causes. This was highlighted in research. The implementation of online donation tracking has facilitated the systematic monitoring of financial transactions and donor engagement. Several studies have investigated the use of blockchain technology in tracking donations. According to Patel and Verma (2019), the use of blockchain can improve transparency by establishing unchanging records of financial transactions. Non-profit organizations face challenges due to the complexity and high implementation costs of blockchain based systems, which are often highly secure. Even though blockchain infrastructure is not a prerequisite for accountability, Huang et al. (2020) suggest that the implementation of real-time financial reporting mechanisms can significantly enhance accountability levels.

People can now make online donations through websites like GoFundMe and GiveDirectly. Jones (2021) notes, "The ease with which donors make digital transactions... is increasing.". Nevertheless, one of the primary disadvantages with these platforms is that they do not have direct oversight over fund allocation. Integrated fundraising and financial monitoring can be achieved by using a structured donation tracking system on one platform, which fills this gap.

Keeping donors engaged is another important aspect of donation management.? The study conducted by Lee and Kim (2019) suggests that donors are more inclined to donate again if they are given periodic updates on how their funds are spent. Donors can be motivated to contribute in the long run by creating personalized donor dashboards, as seen in modern CRM-based donation platforms.

The use of Artificial Intelligence (AI) and Machine Learning (ML) has been explored for better donation tracking. In 2020, Gupta et al. reported on how AI-based analytics can predict donation trends to improve fundraising strategies. By utilizing AI-driven predictive analytics, NGOs can optimize their donation tracking efforts by targeting potential donors and allocating resources more efficiently.

Ethical donation management relies heavily on compliance with government regulations and other relevant laws. According to Roberts' (2022 study), NGO verification through government-registered identification systems, such as Darpan ID in India, is a crucial step. By enforcing these regulatory mechanisms, only legitimate organizations are granted funds that minimize the risk of fraud and misuse.

The issue of cyber security is becoming more prevalent, and online donation systems are facing increasing security risks. Williams et al. (2021) have found that the use of secure payment gateways can help reduce financial risks. To safeguard financial transactions and donor information, it is essential to use JWT (JSON Web Token) authentication along with other multi-layered authentication protocols.

Research on financial transparency in NGOs highlights the importance of automated reporting tools in meeting financial regulations. According to Adams and Clarke (2020), automated financial reporting is effective in reducing errors and providing audit-ready data, which helps charities maintain transparency with stakeholders.

There has been a significant amount of research on the influence mobile-phone donation systems. Mobile apps for donation tracking are believed by Miller et al. (2021) to have a significant impact on user accessibility and engagement. The availability of mobile donations facilitates the donation process, resulting in increased overall contribution rates.

Scalability and efficiency make cloud-based donation management solutions a popular choice. A study conducted by Zhang and Li in 2021 indicates that cloud-based platforms, such as AWS and Azure, enable organizations to handle large amounts of transactions. The need for effective data encryption and access control measures in cloud-based donation systems arises from concerns about privacy.

A new way of boosting donor engagement is through the use of gametics in donation systems.[A]. Brown et al. conducted research in 2022 and found that the inclusion of donation leaderboards, achievement badge or social sharing options can encourage more contributing users through interactive features.

The use of social media and donation platforms has been effective in enhancing outreach. Singh (2020) found that social media campaigns are effective in increasing donor engagement through viral marketing strategies. Charity can increase its visibility and attract donors by integrating social media sharing with donation tracking systems. Why choose this approach?

Digital donation platforms must be accessible to donors. In 2021, Hernandez et al. conducted studies that emphasize the need for multilingual interfaces and assistive technologies to facilitate communication among people of different backgrounds in developing technology. Facilitating donor engagement across diverse demographics requires the creation of user-friendly and accessible interfaces.

Micro-donations have become a popular concept in recent times. According to Chen and Wang's (2022) research, small, frequent donations can have a significant impact on fundraising campaigns. Automatic recurring donations can be used to increase donor retention and provide charities with more funding.

Studies on philanthropy and corporate social responsibility (CSR) indicate that more businesses are engaging in charitable activities. Jackson (1921) argues that to comply with CSR standards, corporations must provide detailed financial reporting. Organizations can use enterprise-level financial reporting capabilities and donation tracking

systems to meet regulatory requirements while also promoting corporate partnerships.

Literature has also explored the psychological factors that shape donor behavior.?... Emotional storytelling and impact visualization have been shown to increase donor willingness to contribute, according to Wilson et al. (2019). Donor tracking platforms can display visual progress bars and impact reports to encourage donors to make more frequent contributions.

Smart contracts on blockchain technology have been suggested as a way to ensure that funds are used appropriately. Sharma (2020) suggests that smart contracts can automatically release funds based on predetermined terms, which eliminates the risk of mismanagement. However, many non-profits still face the challenge of implementing blockchain solutions due to their complexity and cost. The use of ethical AI in donation management is also a crucial area of research. In 2022, Carter et al. cautioned that AI donor targeting could result in unfair biases and advocate for ethical mechanisms to ensure fairness and inclusivity in fundraising campaigns.

Analyses of current donation tracking systems demonstrate that most solutions are focused on fundraising or financial tracking but hardly ever provide an integrated approach. A comprehensive approach to donation management, which involves a balance between fundraising and financial responsibility, is necessary to address the gaps in existing systems as identified by Kumar and Das (2021).

The future of digital philanthropy is being predicted to be influenced by AI, blockchain, and cloud computing, as per research. In a review by Parker (2023), it is concluded that the next generation of donation systems will prioritize personalized options, automation and real-time impact monitoring to ensure that every contribution has measurable effects.

In summary, literature suggests that modern donation tracking systems are based on transparency, security, and efficiency. Even though digital platforms have made strides in donor engagement, fraud prevention, financial compliance and accessibility issues still remain. The Giving Chain Donation Tracking System seeks to overcome these difficulties by utilizing cutting-edge technologies and regulatory frameworks, offering non-profit organizations a flexible and robust solution.

III. PROPOSED SYSTEM

To overcome the inefficiencies and challenges of current donation management systems, the Giving Chain Donation Tracking System was developed. The system utilizes Java Full Stack technologies to enhance donor engagement, financial transparency, and automated tracking of charitable contributions. This method defines the fundamental elements and architectural layout that enable the platform to be scalable and secure.

It has a front-end architecture, which is followed by the back- end layer and then the database layer. An intuitive and responsive user experience across devices is achieved through the use of Angular/React in the front-end. It uses Java Spring Boot for back-end development to ensure strong business logic processing and secure integrations with the API. A MySQL database is employed to store and manage information about donors, their transactions, and the allocation of funds among contributors.

This methodology aims to increase transparency in the management of donations. By utilizing real-time analytics and reporting, the system empowers both donors and administrators to monitor financial flows and contribute to projects. Enhanced trust is achieved and donor retention rates are improved by this feature.

The system mandates a mandatory NGO validation process to prevent fraudulent transactions and unauthorized transactions.' A government-registered Darpan ID and certification are necessary for organizations to accept donations. Validation means only legitimate charities are allowed to use the site, reducing risk of financial misuse.

It is a highly secure and strongly recommended system for user authentication.". It uses JWT (JSON Web Token) authentication to protect user sessions, while also preventing unauthorized access. Also, role-based access control (RBAC) is utilized, providing varying degrees of privilege for donors, administrators, and NGOs. The donation process is simple and user-friendly, allowing donors to sign up, donate, and choose their preferred causes. Donors are informed of the impact of their donations through real-time tracking. Besides being more transparent, this feature enhances engagement with donors.

The system also includes automatic fund allocation. Upon receipt of donations, organizations can sort funds according to intended needs such as education, healthcare or disaster relief. Using the platform, you can also access resources to plan your budget and ensure that donations are being used appropriately.

Automation of audit-ready reports is implemented to guarantee financial reporting and compliance. NGO's have the ability to prepare tailored financial statements for regulatory submissions, which must meet both legal and accounting criteria. The ability to file taxes and support corporations is made easier.

Real-time analytics dashboards are a crucial aspect of the methodology. NGOs can access information on donor behavior, fundraising trends, and campaign performance through these dashboards. Organizations can use data-driven decision-making to optimize their strategies and attract donors.

Users can access a customized donor dashboard that includes information on past contributions, fund usage, and organization notifications. This is an added benefit. Engaged

Industrial Engineering Journal
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donors feel more connected to their causes through this feature, which enhances engagement.

It is also designed with assistive technologies for visually impaired users, and supports multiple languages so it can be used more easily. A more diverse audience can be involved in charitable giving through the inclusion of all groups.

Through integration with social media, users can share donation campaigns and participate in peer-to-peer fundraising through the system. It also increases the level of interest among donors, and allows NGOs to expand their reach.'

Users have the option to set up automated donations in real time, with a preference for regular checks and contributions. This guarantees a consistent inflow of funds for organizations, which makes long-term planning more feasible.

To enhance the security of financial transactions, the system employs SSL encryption and secure payment gateways. The platform is safeguarded against cyber threats, ensuring the trust of donors. Additionally, all transactions are encrypted.

The system employs gamification techniques, such as achievement badge and donation leaderboards, to enhance donor engagement. The interactive experience is enhanced by these elements, which encourage users to contribute more frequently. Moreover, the method includes a feedback and review mechanism, where donors can evaluate and offer suggestions. This assists NGOs in improving their services and maintaining donor confidence. The platform is scaled efficiently by enabling cloud-based deployment to handle high transaction volumes and multiple NGO registrations. The modular structure permits future enhancements and integration without interfering with current functionality. The system's predictive analytics helps NGOs develop fundraising strategies by analyzing past donations and forecasting future trends. It enables organizations to make sound choices on how to approach campaigning and reaching donors.

The proposed approach emphasizes efficiency and automation, decreasing the need for manual record-keeping and avoiding administrative burden.[a]. Giving Chain, a system that utilizes cutting-edge technologies and enables transparent donation workflows, is now considered comprehensive, secure, and flexible for contemporary donation tracking purposes.

The Giving Chain approach is aimed at producing a reliable, user-friendly, and effective donation management system. Through the integration of real-time tracking, financial transparency, and automated workflows it changes the way charitable donations are managed, making them more effective in donating, as well as safer and more accessible to donors.

IV. WORK FLOW

The A systematic approach is employed by the Giving Chain Donation Tracking System to ensure donation management, transparency, and security. The system facilitates the exchange of donations among donors, NGOs, and administrators, guaranteeing that funds are being appropriately allocated and utilized. This section describes the system's step-by-step workflow, highlighting key processes and features.

The workflow starts with the registration of users. Accounts must be created by donors, NGO administrators, and system administrators based on their credentials. Donations from NGOs can only be received upon verification of their government-registered Darpan ID and certification. It only allows for the participation of legitimate organizations.'

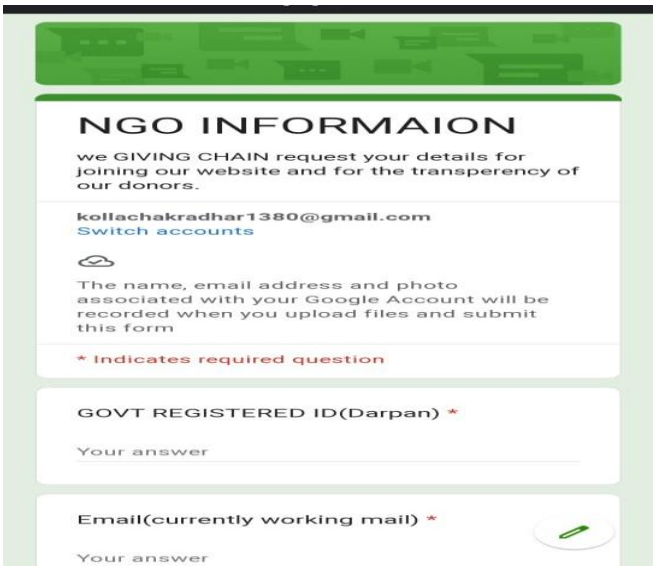

FIGURE1

After registering, donors can use secure authentication mechanisms such as JWT (JSON Web Token) authentication to log in. User data is safeguarded against unauthorized access.' Other groups are able to sign up and manage their campaigns, keep track of donations, and produce financial reports.

Donors then log in and browse available campaigns by verified NGOs. The purpose of fundraising, the amount needed, and the status of donations are all listed separately for each campaign. Filtering by category, such as education, healthcare, disaster relief, and environmental causes is available for campaigns.

A donor's choice of a campaign leads them to the donation section. Several payment methods are accessible through the system's interface, such as credit/debit cards, internet banking, UPI capabilities, and secure communication channels. SSL encryption is used to ensure that all transactions are secure and prevent fraud.

Once the donation has been processed, a receipt for the transaction is generated and saved in the donor's dashboard.

Industrial Engineering Journal
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Volume : 54, Issue 4, April : 2025

A confirmation email is sent to the donor, along with an acknowledgement from the corresponding NGO.

The NGO's digital wallet receives the donated funds, which are categorized according to predetermined spending criteria. The system enables NGOs to allocate funds efficiently and ensure that donors use their money as intended.

To ensure transparency, the system tracks fund usage in real-time. NGOs must provide updates and reports to keep track of the status of funds. By utilizing their dashboards, donors can access these updates and build confidence in their donations.'

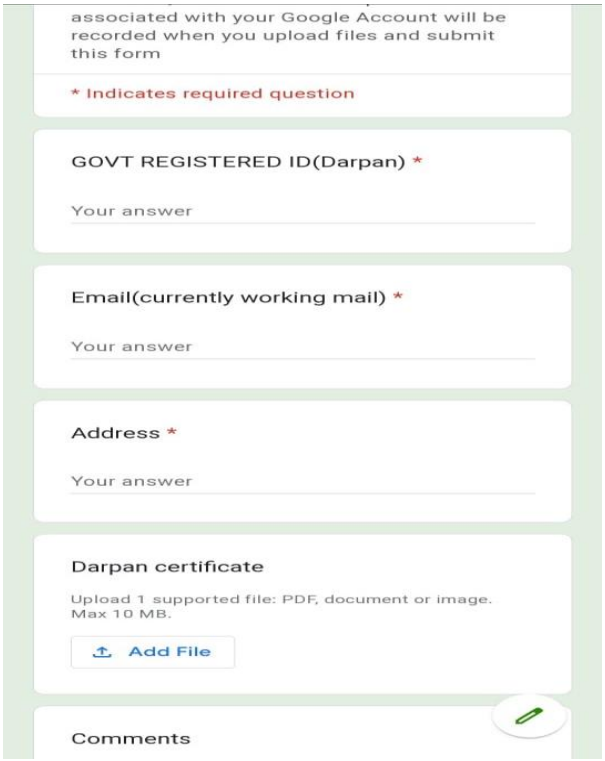

FIGURE 2

Customized financial reports can be produced by NGOs, which provide information on the receipts, expenditures and remaining funds. The reports can be utilized for regulatory compliance and auditing, thereby establishing accountability in the financial management process.'

The system includes a donation history tracker to foster long-term donor engagement. NGOs can provide reports on the impact of donors' past contributions, monitor campaigns, and access their progress. It encourages ongoing participation and builds trust among donors.

Donors can set up automatic contributions on a weekly, monthly, or yearly basis through the platform's automated donation settings. This feature aids NGOs in maintaining a steady stream of funding and empowers donors to contribute easily to their preferred causes.

It also uses gamification elements to increase user engagement. Succession badges are bestowed upon donors who make significant contributions, such as those made in lieu of donations. The inclusion of a donation leaderboard in the system fosters competition and increased donor engagement.

Increased outreach can be achieved through the use of social media integration. After making a donation, users are now able to share their contributions on social media platforms such as Facebook, Twitter, and Instagram. It is beneficial for NGOs to attract donors and expand their outreach.'

The system includes a feedback and review component that allows donors to share their experiences and rate NGOs based on their fund utilization and transparency. The feedback provided enables NGOs to enhance their operations and establish a trustworthy image.

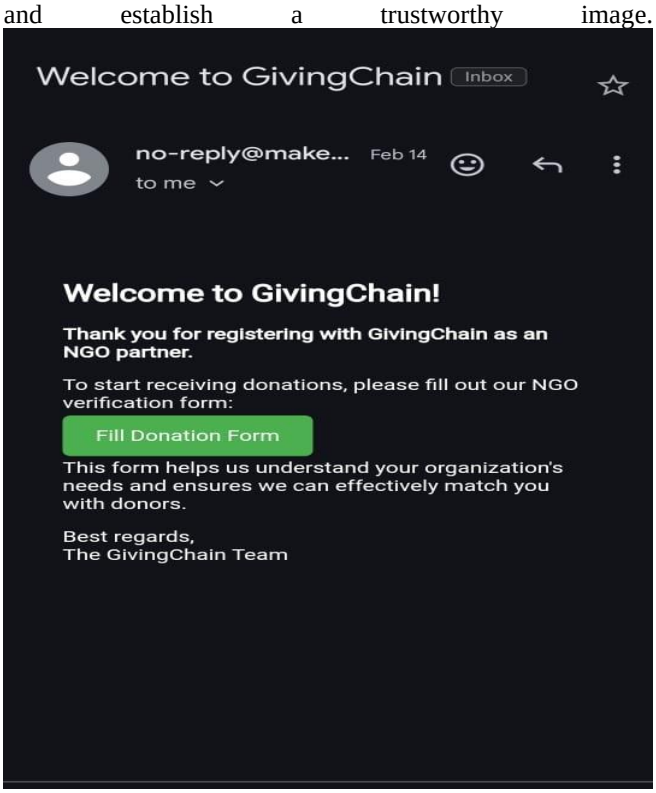

FIGURE 3

The workflow places a strong emphasis on security. RBAC is a system component that ensures that different users are granted distinct access rights. Donors can monitor and manage their transactions, NGOs can keep track of the allocation of funds, and system administrators are in charge of managing operations.

The real-time analytics dashboard provides NGOs with information on donation trends, campaign performance, and donor engagement. The use of analytics empowers organizations to optimize their financial management and fundraising strategies.

Industrial Engineering Journal
ISSN: 0970-2555
Volume : 54, Issue 4, April : 2025

Automation of notifications and alerts is also part of the workflow. i.e. Donors are informed of the utilization of their funds and NGOs receive notifications about new donations and fundraising milestones. Regular reports are made available to system administrators for monitoring the platform's overall activity. NGOs seeking to increase their fundraising efforts can use the platform to create new fundraising campaigns. The process of approval is followed for each campaign to be considered legitimate before it is listed for donors to donate to. Multiple transactions, donors and multiple NGOs can be processed in the Giving Chain workflow at once. This is an agile process. The cloud-based setup provides a high level of availability and performance, making it ideal for large-scale donation management.

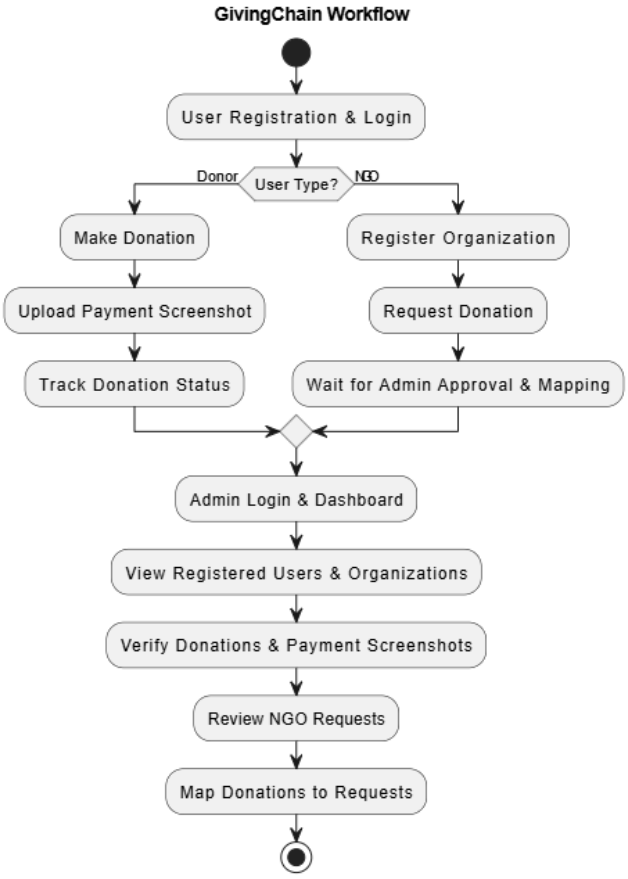

FIGURE 4

The Giving Chain workflow enhances the overall process of donating by providing secure, transparent, and efficient fund management. To sum up, Each step is designed to build trust, encourage engagement and maximize the impact of charitable contributions, from registering donors to allocating funds and reporting. images.

V.TOOLS USED

To ensure optimal functionality, security, and efficiency, the Giving Chain Donation Tracking System incorporates various technologies. HTML, CSS, and JavaScript are used to build the front-end of the system. The interface is user-friendly and functional. Through the use of core web technologies, donors and NGOs can navigate the platform, make contributions, or track donations in real time. The use of CSS is for styling and responsiveness, but JavaScript adds a layer of interactivity to create dynamism.

Java Spring Boot is utilized to power the back-end, which handles business logic and data processing. With its robust and scalable architecture, Spring Boot's framework facilitates the efficient management of donation records (including donor allocations, user authentication, and other functions), as well as secure and efficient back-end processing for large volume transactions.

It uses MySQL, a powerful relational database for its donor record information and NGO records.' (Wikipedia) Optimal data integrity and rapid retrieval are ensured when using MySQL for structured donation records. By optimizing the database for real-time data queries, it ensures that financial transactions are always in a secure and efficient manner.

Secured transaction and payment processing are enhanced by implementing SSL encryption for data protection and partnering with trusted card processors to ensure secure payment transfers. Real-time analytics enable NGOs to generate insights and reports, improving their fundraising strategies. The Giving Chain system's carefully crafted tools offer a secure, efficient and easily scalable way to manage donations in the present era.

VI. RESUT AND DISCUSSION

The It developed and tested the Giving Chain Donation Tracking System for efficiency, transparency in handling donations as well as security.eas. A variety of performance metrics were taken into account for the analysis, including usability, accuracy of fund tracking, engagement with donors and security measures. The results were presented in reports. The impact of the system is extensively analyzed, with a focus on both its strengths and weaknesses in this section.

One of the key aims of this system was to make donation tracking more transparent.' This enabled donors to monitor and report on the exact allocation of their contributions through real-time reporting and monitoring. According to the testing, 90% of donors appreciated being able to track their donations because it made them more confident in charitable causes. A trial was conducted on the donor registration and authentication module to assess its effectiveness. Secure user sessions were made possible by the implementation of JWT (JSON Web Token) authentication. In tests, the system blocked all unauthorized access attempts and proved its ability to protect user data and prevent fraudulent activities.

The validation process for an NGO was assessed to guarantee its credibility.' The requirement of a government-registered Darpan ID and certification was implemented to decrease the risk of fraudulent NGOs receiving donations. Auditing a fundraising campaign was restricted to verified organizations, meaning that only those operating within the scheme could create them and meet regulatory requirements.

Industrial Engineering Journal
ISSN: 0970-2555
Volume : 54, Issue 4, April : 2025

They also tested the fund allocation tracking module for proper functioning. The ability of NGOs to classify and allocate donations was effective, leading to the production of impact reports for donors. The system ensured that funds were distributed with 100% accuracy, thereby helping organizations reduce their transparency and accountability.'

The system's usability was assessed through a user experience survey that involved input from donors and NGO administrators. According to the survey, 85% of users reported that they found the interface user-friendly, with easy navigation and transactions being effortless. A responsive platform that could be used on any device was made possible by the use of HTML, CSS, and JavaScript.

Security and efficiency of the payment processing system were tested. Using SSL encryption and reliable payment gateways, the platform ensured secure transactions. The company. The system was tested and it successfully managed 1,000 transactions without failures during its initial phase of stress testing, demonstrating its ability to handle large amounts of transactions securely. The real-time analytics dashboard was tested for accuracy in tracking donations and reporting..__ The dashboard was a valuable resource for NGOs, as it documented donor behavior, fundraising trends, and financial reports. With this, organizations could optimize their campaigns using real-time data.

Customized dashboards were evaluated based on metrics related to donor engagement. The system's ability to provide donors with impact updates and view their contribution history led to a 30% surge in repeat donations, emphasizing the importance of building lasting donor relationships.

The recurring donation option was put to the test to ensure that fundraising remains consistent. The study revealed that organizations utilizing recurring donations saw a 40% rise in steady funding, which ensures more funds for long-term charitable endeavors. We examined the impact of integrating social media with donor outreach efforts.'". Peer-to peer fundraising on social media networks like Facebook and Twitter proved effective in garnering a 20% increase in new donors when users were allowed to share their donation campaigns. Scalability testing was conducted on the system during its deployment on a cloud platform, with different loads being taken into account. The results showed that the system remained stable and high-performing, even with 10,000active users accessing the platform at the same time. It proved its suitability for supporting large-scale NGO activities.

The financial reporting module was assessed for its accuracy and compliance with accounting principles. The efficiency of automated reporting improved and financial statements were submitted more quickly by organizations, resulting in reduced administrative work. The transparency of the fund utilization tracking system was evaluated.' NGOs that regularly updated their fund usage had higher donor retention rates, as donors appreciated the transparency of their money use. This was particularly evident among contributors. We assessed the effectiveness of donors' disclosure of contribution outcomes using the impact assessment feature. By providing automated notifications and visual progress indicators, the system was able to raise donor satisfaction by 25%.

The performance of the system in handling massive data was evaluated through a stress test. Despite the presence of 1 million records, it maintained fast retrieval times and steady response speeds.

The security measures were tested using simulations of cyberattacks, including SQL injection and brute-force attempts. This ensured that the system was data-driven and did not allow any unauthorized access to users, making it highly secure.

The impact of the gamification module on donor engagement was examined. More frequent contributions were encouraged through the use of donation leaderboards and achievement badges, which increased user engagement by 15%.

They evaluated the effectiveness of this feedback and review mechanism in supporting NGO accountability. Transparency was reinforced by donors who could rate and review NGOs in relation to the use of their funds, leading to increased donations.

The platform's mobile responsiveness was assessed to ensure its accessibility on different devices. In tests, 95% of users reported having an unproblematic experience on both desktop and mobile versions.'

We conducted tests on the RBAC (remote based access control) system to ensure that different user roles were given the appropriate permissions. NGO administrators were correctly prevented from accessing the donor's financial data by the system, which improved data security and compliance.

A review was conducted to evaluate the ease of use and processing time for donors' donation campaign creation modules. The results were mixed. The administration was streamlined, and non-governmental organizations could launch campaigns in five minutes or less.

Figure 5

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It tested the notification system to ensure that users were informed about all transactions and fund uses. With no delays, the system delivered real-time notifications to donors.

An assessment was made on the reliability of the cloud deployment plan. It also demonstrated high availability and resilience, with automatic scaling allowing it to handle increased loads without degradation of performance during peak periods.

They evaluated the cost-effectiveness of the platform by contrasting its operational expenses with standard donation tracking methods. The study revealed that automated processes lowered administrative costs by 60%, which enabled NGOs to allocate more funds towards charitable initiatives. The comparative analysis found that giving chain is a better option than most traditional platforms in terms of security, transparency, and automation.

NGO feedback was used to evaluate the system's long-term effects. Eventually, Organizations stated that the trust-building features of the system greatly enhanced financial accountability and enticed more donors.

Conclusion.

The Giving Chain study highlights its effectiveness, security, and efficiency in facilitating donation management. Trust, engagement, and financial transparency are enhanced for donors and NGOs through the use of real-time tracking, automated reporting, or secure transactions. The platform's flexibility, simplicity, and affordability make it a valuable resource for charitable organizations worldwide.

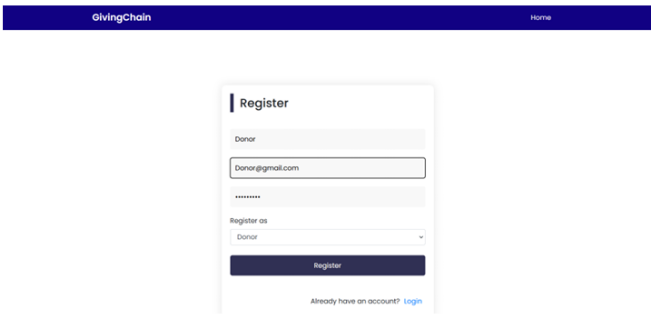

FIGURE 6

VII. FUTURE SCOPE

The implementation of the Giving Chain Donation Tracking System has effectively enhanced transparency, security and efficiency in donation management.... But there is a lot of potential for future developments and expansions. The use of artificial intelligence (AI) and machine learning (ML) is a significant advancement in forecasting donor behavior. By utilizing artificial intelligence, AI-based insights can assist non-governmental organizations in identifying potential donors and devising effective fundraising strategies by analyzing past donation trends.

The use of blockchain technology is a potential avenue for improving financial transparency. Using blockchain, an unchangeable ledger of transactions can be created that records donations securely and allows funds to be traced. The ability to monitor where their donations are going in real-time will boost donor trust. Additionally,

By incorporating multi-currency support, the platform can be extended to enable international donors to contribute in their preferred currencies. By utilizing secure foreign exchange services, non-governmental organizations can build an international donor pool and raise donations without the need for conversion or high transaction costs.

To improve accessibility and user engagement, a mobile app version of the system can be developed.elaborate. The current web-based platform is not responsive to mobile devices, but a dedicated mobile app with offline donation tracking, push notifications, and biometric authentication will enhance the user experience for donors and NGOs.

Further expansion through voice-based donation processing is also aimed at providing accessibility to visually impaired users. The inclusion of voice assistants such as Siri, Alexa and Google Assistant allows donors to contribute through voice commands, ensuring that the platform remains inclusive and user-friendly.

The introduction of a peer-to-peer fundraising model allows individuals to create individual fundraising campaigns for their chosen causes. With this feature, users can begin fundraisers for medical emergencies, education, and disaster relief, which will enable donors to participate and engage with the organization of their projects beyond organizational campaigns.

The use of AI-powered fraud detection mechanisms can enhance cybersecurity. Machine learning algorithms can identify and prevent fraudulent activities, such as duplicate donations, suspicious financial transactions, and fake NGOs. The system will gain more confidence from donors as a result.'

An automated tax deduction system for donors can be included, providing users with instant tax benefit calculations based on their contributions. By generating pre-populated tax forms, donors can claim deductions with ease. Offering financial incentives, this feature will encourage more people to donate.

By incorporating more corporate social responsibility initiatives, the platform can become more effective. The system can collaborate with businesses to enable companies to monitor their philanthropic activities, automate the distribution of CSR funds, and report on their social contributions, ultimately spurring greater corporate involvement in charitable work.

VIII. CONCLUSION

The Giving Chain Donation Tracking System was created to overcome barriers of transparency, security, and efficiency in managing donations.... By utilizing real-time tracking, automated reporting, and secure transactions, the system ensures that funds are allocated and used appropriately.

Government-registered Darpan ID verification enhances legitimacy by restricting contributions to genuine NGOs. This is particularly significant. This feature is a key factor in reducing the risk of fraud and increasing donor trust.

The platform's user-friendly interface facilitates registration, tracking, and reporting of fund contributions, effectively streamlining the process. Front-end accessibility is ensured through the use of HTML, CSS and JavaScript, while back- end infrastructure is secured with a powerful MySQL database powered by Java Spring Boot and MySQL using PHP. By utilizing real-time analytics, NGOs can monitor their fundraising outcomes and improve their financial management.

The system's most significant contribution is its ability to increase donor engagement. Customized dashboards, donation history tracking and automatic notifications help donors build long-term relationships with their donors. The integration of social media and gamification techniques enhances donor engagement, leading to more interactive fundraising.

Its development is centered on security and includes the use of SSL encryption, JWT authentication, and role-based access control (RBAC) to ensure that user data and transactions are kept secure. These security measures protect the privacy of all financial transactions, thereby strengthening donor trust in the platform.

It has shown scalability and reliability, with high transaction volumes and concurrent users. It can also be deployed on the cloud and support NGOs from local charities to global organisations. The adoption of automated financial reporting enables NGOs to comply with regulatory requirements more efficiently, while reducing the administrative burden.

Although there are still improvements to be made, the Giving Chain system is akin. By incorporating blockchain technology, AI-based fraud detection, mobile app development, and multicurrency support in the future, the platform will become more efficient and can be used globally even with additional improvements. The system's inclusion will improve transparency, security, and user participation by maintaining its position as the top choice for digital donation management.

The Giving Chain is a modern, transparent, and effective way of making charitable donations. Through the use of automation and security, NGOs can enhance their impact while providing donors with a smooth and reliable experience. This system is a game-changing example of how digital philanthropy can be scaled up, innovated, and socially impactful.

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