SolidarIta: a Fundraising System to Support Organized Civil Society Institutions

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Abstract

Context: In contexts of economic vulnerability, non-profit and solidarity organizations, such as Organized Civil Societies (OCSs) in Brazil, play a pivotal role in promoting equity and combating inequalities. With approximately 879,000 OCSs in 2023, these entities act where the State and the market fail, but face challenges in raising funds due to a still limited donation culture.

Problem: Transparency and integrity in fundraising are essential, but money laundering and threats such as extortion and phishing compromise transaction security. The lack of clarity in operations can undermine donors' trust, making fundraising even more difficult.

Solution: This paper presents a solution using Information Technology through the SolidarIta system, which aims to simplify the donation process for needy entities.

IS Theory: SolidarIta allows registered organizations to create wish lists, facilitating the digital connection between donors and suppliers, such as supermarkets. Donors can choose items and make payments, while partners care for delivery, ensuring transparency.

Method: The investigative research used literature analysis to model the system, followed by data collection through questionnaires to assess its impact and usability.

Summary of Results: The system has demonstrated its effectiveness, with 89.3% of participants expressing satisfaction and 93.6% finding it useful. These results instill confidence in the potential of the SolidarIta system.

Contributions and Impact in the IS area: SolidarIta facilitates interaction between donors, organizations, and partners, promoting transparent and efficient donations, improving the user experience, and increasing engagement in solidarity actions.

CCS Concepts

• **Information systems → Collaborative and social computing systems and tools**.

Keywords

Organized Civil Societies, Solidarity Actions, Fundraising System, Technology for Social Impact

1 Introduction

Assistance to economically vulnerable groups goes beyond simple charity; it is a commitment based on humanitarian principles to reduce inequalities and promote equity, which is often difficult to achieve. As highlighted by [5], non-profit organizations represent "a space for participation and experimentation of new ways of thinking and acting on social reality. It is the emergence of a non-state public sphere and private initiatives with a public purpose". The existence of these institutions is the result of the identification over time of social gaps and the imperative of social movements that are dedicated to supporting these causes.

In Brazil, OCSs (Organized Civil Society), popularly known as NGOs (Non-Governmental Organizations), and other social projects aim to act where the State and the market do not provide services. These organizations are distributed throughout the country and have gained increasing visibility in recent decades, highlighting their importance and challenges.

In 2023, the country had approximately 879 thousand OCSs[1]. According to [5], since they are not profit-oriented, these initiatives depend on external resources to finance their activities, which come from various sources such as donations, sponsorships, partnerships, or public funding. The authors of the study [6] add that these organizations can raise funds through donations, contributions from the government (federal, state, and municipal), and external resources. However, donating is still not as widespread as its importance, resulting in a challenging scenario for raising funds.

In this context, the central idea of this project emerged: to develop a system that simplifies the donation process for OCSs, making it more accessible and attractive to the community. Technology can connect people to social causes in a globalized and agile way. A system of this nature allows people to donate with just a few clicks, eliminating barriers such as travel time and facilitating connections between existing and potential donors for social actions.

The proposed system, called SolidarIta, seeks to simplify and enhance donations to social organizations, providing a digital connection between those involved. Once registered, organizations can create wish lists detailing essential items for their activities, such as a kind of shopping list. Partners, such as supermarkets and pharmacies, have the opportunity to supply these supplies.

In this way, donors access the system to make donations, choosing items from the organizations' wish lists. After payment, the provider partner takes over the delivery of the items, ensuring a transparent contribution. The system goes beyond the wish list, offering online volunteering and donation campaigns and facilitating the organizations' accountability.

The remainder of this paper is organized into the following sections: Section 2 addresses the theoretical background; Section 3 presents the modeling of the proposed system; Section 4 shows SolidarIta; Section 5 discusses the evaluation and results; finally, Section 6 presents the conclusion and premises for future work.

[1] https://www.ipea.gov.br/portal/categorias/45-todas-as-noticias/noticias/15065-brasil-tem-mais-de-879-mil-organizacoes-da-sociedade-civil-ativas

2 Theoretical Background

Organized civil society (OCS) is the set of voluntary civic organizations and institutions that form the foundation of a functioning society, in contrast to state-supported structures. These entities include Non-Governmental Organizations (NGOs), trade unions, community associations, advocacy groups, and other institutions that operate in the public space on a non-profit basis [9].

2.1 Organized Civil Society: An Overview and its Socio-technical Challenges

The NGO emerged in the 1950s and was created by the United Nations (UN)[2] to encompass civil society entities independent of governments. Today, NGOs are private organizations with public interest missions, operating without profit objectives. Many of them originated in social movements and activism. For example, the International Red Cross[3] was founded in 1863 and is considered one of the first modern humanitarian NGOs. Social movements, such as civil rights in the United States and environmental activism in the 1960s and 1970s, also drove the growth of NGOs.

Due to their independence from governments and non-profit nature, NGOs depend on various funding sources to ensure their sustainability. These sources include individual donations, government funding, partnerships with companies, grants from philanthropic foundations, and even revenue generation through commercial activities related to their mission [7]. Individual donations play a significant role, reflecting increased people's appreciation of and involvement in social causes. Today, donations are an indispensable resource for the survival of NGOs.

Charitable giving is contributing money, time, or resources to a non-profit organization or cause to impact society positively. It can involve money, material goods, volunteer work, and professional expertise. Charitable giving addresses social, environmental, cultural, and humanitarian issues by providing resources to organizations and projects dedicated to the community's well-being.

In Brazil, community participation in donations has increased significantly, driven by awareness campaigns and social initiatives. According to a 2022 study by the Institute for the Development of Social Investment [4], 84% of Brazilians with a family income above the minimum wage and over the age of 18 made some donation, with 36% going to NGOs and socio-environmental projects.

A clear example of the importance of these donations was observed in the floods in Rio Grande do Sul in 2024, which were catastrophic to the point of affecting around 478 cities, resulting in the death of 182 people, and the number of those affected totaling more than 2 million people[5].

With over 432,000 people displaced from their homes and needing immediate assistance, agility in the collection and distribution of resources was essential to meet the urgent needs of the affected population. A system like the one proposed in this study aims to simplify and accelerate the donation process and facilitate the connection between donors and vulnerable communities, creating a positive impact in these situations. It would allow for a faster and more efficient response to emergencies, helping to reduce the suffering of affected communities.

However, transparency and integrity in fundraising are critical to ensuring that contributions reach their intended destinations and generate the desired impact. The potential for money laundering through seemingly legitimate donations poses a significant challenge. Cases of money laundering disguised as charitable contributions have been reported in recent years.

In 2020, for example, the Civil Police operation in São Paulo resulted in the seizure of more than R$690 thousand at the headquarters of "Apoio Associação de Auxílio Mútuo"[6], and at the Operation "Moradia" in Campo Grande (MS), in which of the R$3.6 million financed by the government, only R$2.7 million were paid to the entity[7].

Such cases highlight concerns about the origin of funds and the legitimacy of transactions. In addition to money laundering, challenges such as extortion and phishing attacks [8] also impact the integrity of fundraising, highlighting the importance of robust security measures.

Another challenge in ensuring that donations continue to flow is maintaining high standards of transparency and accountability. Donors look for organizations that demonstrate how their funds are used. A lack of transparency can undermine donor trust, becoming an additional challenge that OCSs face when seeking funding.

Given the above, Information Technology emerges as a tool to resolve these challenges. Data from 2022 shows that 82% of non-profit organizations use the Internet, a significant increase compared to 2016. TIC Organizações Sem Fins Lucrativos carried out the research that originated this data to investigate the access, use, and appropriation of information and communication technologies by organizations such as NGOs, associations, foundations, and religious organizations in Brazil [10].

The research also highlights the importance of OCSs' presence in the digital environment and their relationship with technology. Technology is relevant in this sector due to its global accessibility, which connects people from different parts of the world to humanitarian causes. In addition, it facilitates the reach of new employees, motivates teams, and even helps in fundraising.

The technological revolution has also transformed the donation process. The introduction of secure online payment systems, such as credit cards, PayPal[9] and PIX (Brazilian instant payment), has made contributing quick and convenient, eliminating geographical and bureaucratic barriers. Also, in the 2022 survey, IDIS highlighted that PIX has become the preferred payment method for 39% of donors, further speeding up contributions and strengthening digital platforms as vital tools to support social initiatives.

[2] https://brasil.un.org/pt-br
[3] https://doe.cicv.org.br/
[4] https://pesquisadoacaobrasil.org.br/
[5] https://www.unocha.org/publications/report/brazil/brazil-floods-rio-grande-do-sul-united-nations-situation-report-25-june-2024
[6] https://g1.globo.com/sp/sao-paulo/noticia/2020/11/18/policia-apreende-r-690-mil-em-dinheiro-em-ong-investigada-por-desvio-de-verba-publica-em-sp.ghtml
[7] https://correiodoestado.com.br/cidades/policia/gaeco-cumpre-mandados-em-ong-suspeita-de-lavar-dinheiro-na-gestao-bern/384448/
[8] Phishing is an attack that attempts to steal money or the identity of a person or organization by making the victim reveal personal information [1].
[9] https://www.paypal.com/br/home

2.2 Related Works: Systems Supporting OCS

Several systems aim to assist in raising funds for needy organizations. The Red Cross, for example, is an international humanitarian organization dedicated to assisting people in vulnerable situations, such as victims of armed conflicts, natural disasters, and other emergencies[10]. It is part of the International Red Cross and Red Crescent Movement, which includes several national societies. The institution facilitates online donations on its official website, providing a user-friendly interface. Donors have the flexibility to choose the amount to be donated and choose to help monthly, establishing a type of subscription. The purpose and impact of the contribution are always shared with the donor, covering areas such as humanitarian assistance in emergencies, health programs, support for vulnerable communities, and other causes. Another feature carried out periodically is publishing a list of items most needed, allowing contributions to be better targeted. Furthermore, it has a rigorous process for reporting on donations received, providing reports with facts and figures from its programs [11].

Benfeitoria is a crowdfunding platform created in 2011, focused on social and cultural projects[12]. It allows individuals and organizations to fund their initiatives through online donations. Project creators describe their ideas, set fundraising goals, and reward supporters. If the goal is reached, the money is released to the project. The platform allows creators to inform supporters about the progress of their campaigns on their page and the use of funds through the "News" section, ensuring transparency and accountability. Benfeitoria aims to drive the realization of positive and impactful ideas by connecting donors to the causes they believe in.

The "Para Quem Doar" platform is an initiative that helps people find social projects to support[13]. It aggregates initiatives, allowing users to filter projects by region and topic of interest, such as education, health, environment, among others. In addition, the platform highlights emergency campaigns, as was the case with the floods in Rio Grande do Sul, mentioned above, and donation initiatives, facilitating the contribution process. It is related to other online donation systems, such as Benfeitoria, with which it collaborates on several campaigns, enhancing the impact of donations.

Kickante is also a crowdfunding platform that allows creating campaigns to raise funds for various types of projects[14]. Any person or organization can create a campaign, setting a fundraising goal and a deadline to achieve it. The campaign is publicized to the public, who can make donations through the website using different payment methods. The main objective is to reach or exceed the established goal. Once the goal is reached, the funds are available to the campaign creator, who must use them according to the stated purpose. The platform allows creators to update supporters on the progress of their campaign and the use of funds in the “News” section, ensuring transparency and accountability.

Save the Children is an international organization that works to improve the lives of children around the world [15]. The organization was founded in 1919 and offers a variety of programs and services for vulnerable children. Donations to Save the Children can be made in various ways, including online, by phone, bank transfer, bank deposit, or credit card. To donate to the Save the Children website, access the organization’s link and select the amount you wish to donate, or opt for a subscription for monthly donations. In addition, this organization has a rigorous transparency and accountability process, providing reports including audited economic information, budgets, and annual accounts.

Another system is called Vakinha[16]. It offers a practical and effective way for individuals and organizations to raise funds for various causes and projects. The platform allows organizers to create a customized campaign, set a fundraising goal, and share the campaign on social media and with their networks. Donors can visit the campaign page and make financial contributions to help reach the established goal. The platform offers several payment options, including credit cards, invoices, and bank transfers. Each campaign displays information about the organizer, the fundraising goal, the amount raised, and the donors. This promotes transparency and allows people to see the progress of the campaigns.

Therefore, Befeitoria, Kickante, and Vakinha operate in the crowdfunding model, where several people contribute to achieve predefined financial goals. On the other hand, the Red Cross and Save the Children are organizations that make fundraising methods available on their websites, allowing recurring donations.

Table 1 compares the functionalities of these most popular current systems. It highlights the presence of goal achievement in Kickante, Vakinha, and Befeitoria, three popular and large coworking platforms, showing that this methodology is widely selected for donation campaigns. However, it also demonstrates market saturation with similar options, which raises questions about the need to include it in another donation platform. In the case of Para Quem Doar, the goal achievement model is not directly provided. Instead, it focuses on facilitating donations to specific organizations and campaigns, often in partnership with Benfeitoria.

Table 1: Related Works Features

Features	Web-based donation system for social purposes					
	Kickante	Vakinha	Save the Children	Red Cross	Benfeitoria	Para Quem Doar
Goal achievement	✓	✓	-	-	✓	-
List of products for donation	-	-	✓	✓	-	-
Partnerships with institutions	-	-	✓	✓	-	-
Accepts PIX	-	✓	-	-	✓	✓
Gamification	-	-	✓	-	-	-
Volunteer campaigns	-	-	-	-	✓	-
Profit purposes of the platform	✓	✓	-	-	-	-

The system proposed, called SolidarIta, stands out by focusing on simplifying and securing donations to charities in need. By adopting the wish list approach commonly found on wedding gift websites such as iCasei [17] and Wedy [18], the system seeks to connect donors to the specific needs of organizations, providing a transparent and targeted contribution. SolidarIta stands out as a solution tailored to the particular demands of the community in question.

[10] https://www.icrc.org/en/we-are-international-committee-red-cross-icrc
[11] https://www.icrc.org/pt/publication/humanidade-em-acao
[12] https://benfeitoria.com/sobre
[13] https://www.paraquemdoar.com.br/sobre
[14] https://www.kickante.com.br/portal-do-empreendedor/como-funciona/sobre-a-kickante
[15] https://www.savethechildren.net/about-us
[16] https://www.vakinha.com.br/quem-somos
[17] https://www.icasei.com.br/
[18] https://casamento.wedy.com/

3 Proposal

The main objective of this paper is to use digital tools' benefits to support humanitarian causes, encouraging an increase in community participation and fundraising for social entities.

After a comparative analysis of existing work and systems, an interview was conducted with an experienced person in the fundraising context. Initially, in the first interview, a questionnaire was prepared to collect primary and comprehensive information about the fundraising processes of the OCSs entities. The objective was to understand these entities' greatest difficulties and needs in order to develop the best solutions. The questionnaire served as a guide for the interview, guiding the debate on the topic during the meeting.

The questionnaire was designed with the following questions:

- What are the most significant problems entities generally face concerning collections?
- What features would be essential in a centralized donation system to meet the primary needs?
- How can a system like this be used to increase community donations and support?

The questions were discussed in an interview, and the answers were mapped to product modules called Epics, sufficient to have business value. As explained by [3], Epics are the primary objectives that organize and guide product development. They are made up of sets of user stories that, in turn, are detailed into specific tasks.

More specific details about the system were possible to extract from the Epics. In Software Engineering, these details are often called "Functional Requirements (FR)." Each FR represents a specific function the system must perform or a specific behavior it must exhibit. Table 2 shows the FRs.

Table 2: Functional Requirements

FR	Description
FR01	The system should allow institutions to pre-register.
FR02	The system should allow institutions to register information about themselves, such as their name, objectives, and contacts, in their profiles.
FR03	The system should allow institutions to edit information in their profile.
FR04	The system should allow institutions to register donation collection campaigns.
FR05	The system must allow institutions to register a list of demands.
FR06	The system must allow donor payments to be made through the PIX system.
FR07	The system should allow institutions to register volunteer campaigns.
FR08	The system should allow institutions to seek and accept partnerships with partners, such as companies and businesses, for discounts and service provision.
FR09	The system must allow the administrator to check and validate the entry of new partners into the system.
FR10	The system should allow partners to pre-register.
FR11	The system should allow partners to register information about themselves, such as their name, product list, and contacts, in their profiles.
FR12	The system should allow partners to edit information in their profiles.
FR13	The system should allow partners to be searched and displayed.
FR14	The system should allow partners to register partnership offers for institutions, such as discounts and service provision.
FR15	The system must allow donors to register.
FR16	The system should allow donors to search for institutions.
FR17	The system should allow donors to donate money to charitable giving campaigns.
FR18	The system should allow donors to sign up for volunteer campaigns.
FR19	The system must allow donors to make payments via PIX.
FR20	The system must allow institutions to account for their revenues.
FR21	The system must allow donors to view the institutions' financial statements.
FR22	The system must allow the administrator to verify and validate the entry of new institutions into the system.
FR23	The system should allow donors to receive rewards for their positive actions.
FR24	The system should allow institutions to provide reward benefits for donors' positive actions.
FR25	The system should allow the administrator to view the list of donors.
FR26	The system should allow the administrator to delete an institution, partner, or donor from the system.

Based on the analyses, the system could be modeled. To this end, use case, process, C4, class diagrams and flowcharts were used as support tools. However, it is important to emphasize that, in general, Brazilian non-governmental organizations (NGOs) do not have a complete macro process and a formatted business model.

Studies such as those by [4] and [8] highlight the need for more structured strategic planning in these organizations. [4] presents a case study on developing strategic planning in an NGO, demonstrating the complexity and challenges involved. In turn, [8] discusses the application of the Balanced Scorecard in a third-sector organization, highlighting the importance of management tools for developing and implementing effective strategies. These articles reinforce the idea that adopting strategic planning methods and tools can contribute significantly to the efficiency and sustainability of NGOs in Brazil.

During the development of this research, this lack of reference became clear. Several modeling tools guided the implementation and organization of the process structuring steps to overcome this limitation. From this, the flowcharts in Figures 1, 2, and 3 were developed to detail the donation processes in a macro way.

The flowchart in Figure 1 describes the process of a donation campaign, starting with the donor choosing the campaign and the amount to be donated. Then, the institution receives the amount, ends the campaign, declares the use of the resources, and discloses the results. Finally, a partner defines a new campaign, restarting the cycle. Colors represent the steps: yellow for the donor, red for the institution, and blue for the partner.

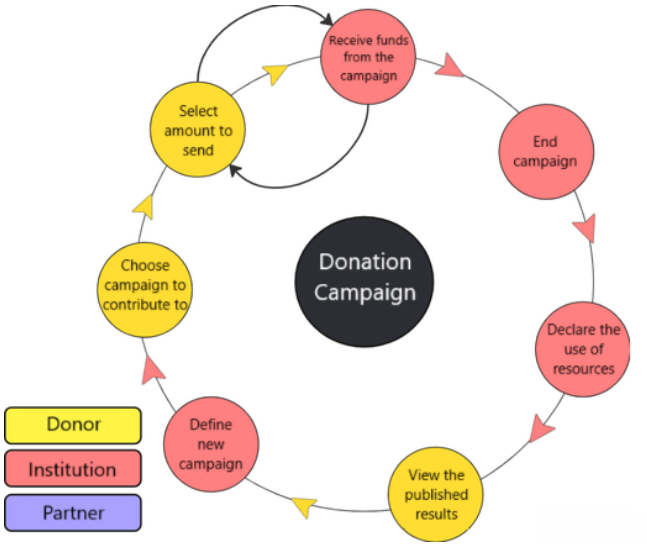

Figure 1: Donation Process Flowchart

The flowchart in Figure 2 describes the process of a volunteer campaign, starting with the donor choosing the campaign and signing up as a volunteer. The institution contacts the registered volunteers, ends the campaign, declares the use of the funds, and publishes the results. Finally, a partner defines a new campaign, starting the cycle again.

The flowchart in Figure 3 describes the process of a wish list campaign. The institution starts by creating a campaign in which it is necessary to select products from a partner to form a shopping list. The partner then receives the purchase order from the institution and accepts it. After acceptance, the campaign becomes available to donors, who choose the campaign to contribute to and select the

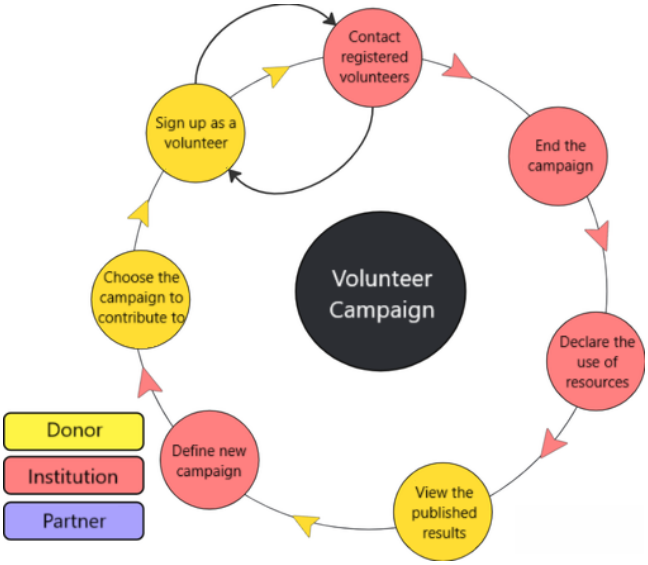

Figure 2: Volunteer Campaign Process Flowchart

products to purchase, and then the institution purchases the paid products. Ultimately, the partner schedules the purchase delivery, and the institution receives all the products. After receiving the funds, the institution ends the campaign, declares the use of the resources, and discloses the results. The cycle restarts with the definition of a new campaign.

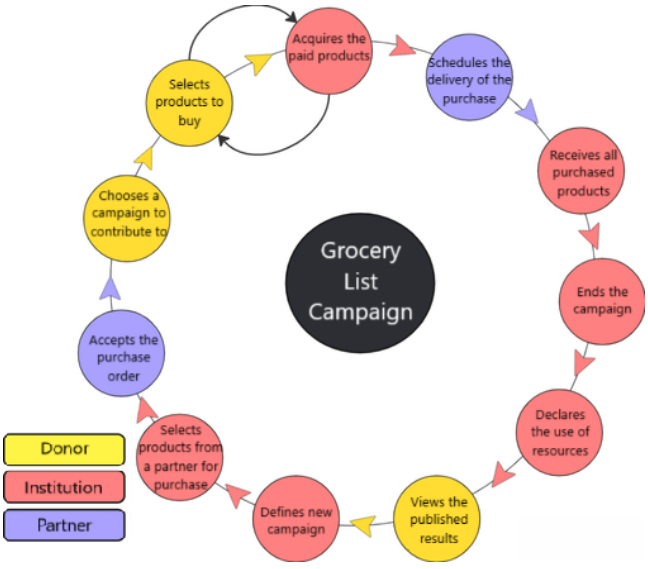

Figure 3: Wish List Campaign Process Flowchart

In the system there are four actors: the Institution, the Donor, the Partner, and the Administrator. The **Institution** consists of the needy institution. It seeks support for its activities, presenting a list of input/product needs (wish list) and options for collecting donations and volunteers. In addition, it establishes partnerships with those responsible for providing the listed products (Partners), maintaining their detailed data in the system.

The **Donor** contributes by paying for items on the needs list (wish list created by the Institution) or helping in other ways, whether through volunteer work or donating campaigns. In addition, he can monitor the institutions' financial statements.

The **Partner** consists of an entity that contributes by providing products, services, and discounts to institutions, maintaining a profile in the system with the available products, which are inserted into the wish lists by a given Institution.

Finally, the **Administrator** is responsible for administering and managing SolidarIta, validating the admission of new partners and institutions, managing the list of users, and controlling the permanence of donors, partners, and institutions in the system. The permanence of institutions also depends on the adequate presentation of financial statements.

4 SolidarIta

The SolitarIta system architecture uses a layered approach based on the client-server structure, which facilitates maintainability, scalability, and modular development. The main layers are:

- **Application Layer:** This layer is responsible for the user interface. It uses the React.js framework to create a dynamic and responsive user experience.
- **Business Layer:** It contains the system's business logic. Implemented in Node.js with TypeScript, this layer manages business rules, such as donation validation, campaign creation, and user management.
- **Persistence Layer:** Manages communication with the database. Uses TypeORM[19] to interact with a PostgreSQL database, allowing efficient and secure queries and operations.

The choice of technologies for the system development was made based on performance criteria and ease of development and maintenance. Table 3 details the main technologies used. These approaches ensure that the system is functional, efficient, safe, and reliable for all its users.

The system was designed to integrate donation campaigns, volunteering, and wish lists. The following are the most important SolidarIta screens, highlighting their functionalities and how each contributes to achieving the stipulated objectives. The actual version is in Portuguese and English.

The login screen was designed to allow registered users to log into the system. It contains fields for email and password and an anonymous access option, allowing the system to be accessed for simplified donation functionality without needing identification.

The home screen (Figure 4) overviews available campaigns. Here, users can view ongoing campaigns and choose which one they want to contribute to. A navigation menu allows easy access to other system features, facilitating user interaction and engagement.

Institutions can create new campaigns in detail on the campaign creation screen (Figure 5). Each type of campaign has specific information, such as products for wish lists or location and time of volunteer campaigns, in addition to the main fields, such as description, campaign name, and objective. After filling in the fields, the campaign can be saved. In the case of the wish list, it goes through

[19]https://typeorm.io/

Table 3: Technologies and Architecture Used

Category	Technology and Description	Version
Front-end	**React.js**: Used for building the user interface. Allows the creation of reusable components and a dynamic and responsive interface.	17.0.2
	Chakra UI: A React component framework that makes it easy to create aesthetically pleasing interfaces.	1.7.3
Back-end	**Node.js**: Used for developing business logic. Chosen for its ability to handle asynchronous operations and its efficient real-time performance.	17.0.45
	TypeScript: A JavaScript extension that adds optional static typing. It makes it easier to detect errors and improves code quality.	4.5.4
	Express.js: Minimalist framework for Node.js that makes it easy to build robust and scalable APIs.	4.17.2
Database	**PostgreSQL**: A robust and scalable relational database known for its ACID (Atomicity, Consistency, Isolation and Durability) compliance, security, and ability to handle large volumes of data.	14.0
	TypeORM: An ORM for TypeScript and JavaScript (Node.js) that facilitates database interaction and improves development productivity.	0.2.41
Infrastructure	**Docker**: Used to create consistent and scalable development environments. Facilitates the deployment of application and database containers.	23.0.3
	AWS EC2: Used to host the application, providing scalability and high availability.	-
	Docker Compose: Tool for defining and managing multi-docker containers, simplifying configuring, and orchestrating services.	2.27.0
Security	**Authentication and Authorization**: Implementation of registration and login, separating the types of access to the system to restrict the viewing of private information.	-
	Encryption: Using the Node.js `crypto` module to encrypt passwords before storing them in the database.	-

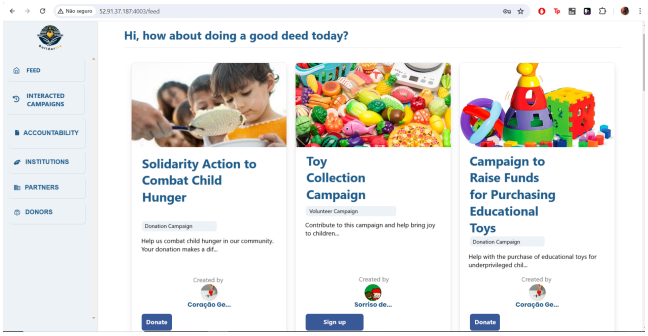

Figure 4: Home Screen

an approval stage by the partner and, finally, is available for donor integration.

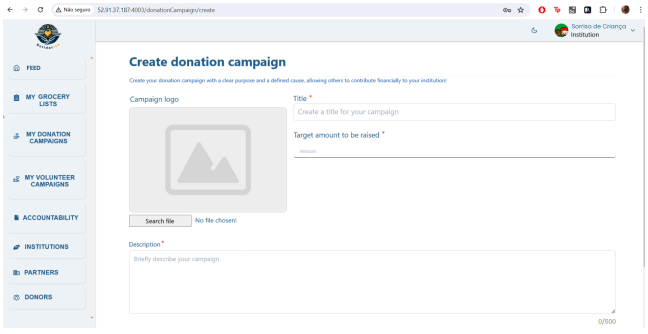

Figure 5: Donation Campaign Creation Screen

Institutions can monitor the progress of their campaigns through the Campaign Monitoring screen, shown in Figure 6. Information about donations received, products purchased, and volunteers registered is displayed. There are also options to edit ongoing or end completed campaigns, allowing for efficient and up-to-date monitoring. It is important to note that campaign editing is only available until the campaign receives any contribution.

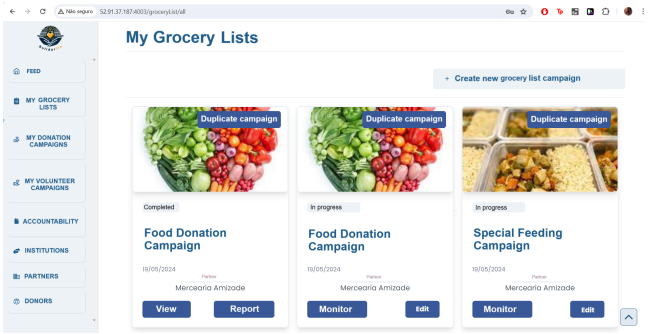

Figure 6: Wish List Campaign Monitoring Screen

The campaign details screen (Figure 7) provides comprehensive information about a specific campaign. It displays the full description, current status, and options for contributing. In the case of wish list campaigns, the required products are listed with options for purchasing, making it easier for donors to participate.

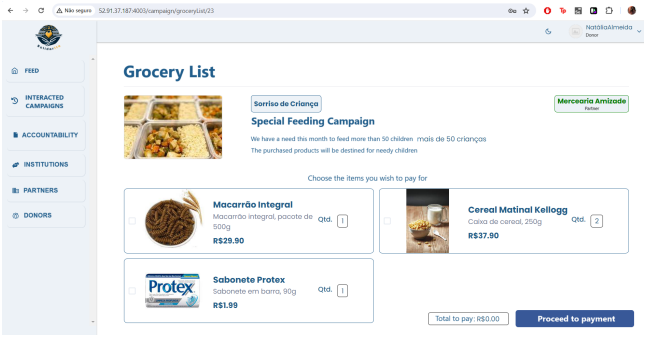

Figure 7: Wish List Campaign Details Screen

The reporting screen in Figure 8 provides an overview of completed campaigns. It includes a view of purchases, amounts donated via PIX, and participating volunteers. It also shows information about the completion of the campaign and the institution's accountability regarding the campaign results. This screen facilitates accountability and transparency of actions.

After the development of the proposed system, an evaluation was carried out to validate its effectiveness and level of acceptance among users. To this end, data was collected using a form from people who fit into the three distinct categories of system users: donor, institution, and partner. Focusing on the specific functionalities of each category, a specially targeted questionnaire was developed to understand the real impact and usability of the system.

Figure 8: Volunteer Campaign Accountability Screen

5 SolidarIta Evaluation

This section details the quantitative evaluation conducted on the SolidarIta system, which aimed to obtain feedback on several aspects of the system, including design and usability. No personal information was used about the participants; therefore, no ethical issues were violated. In total, 47 people responded to the questionnaire created using Google Forms. The questionnaire was sent to individuals involved in social issues, such as donors, business partners, and representatives of social institutions in the city of Itajubá (MG) and the surrounding region. In addition, some regular users were also invited to participate in the process. The complete evaluation form is available on the project's GitHub[20].

Of the 47 responses, 39 represented people who contribute or show solidarity in some way with social causes as individuals, and seven were from representatives of institutions that carry out social work. Several contacts were made with commercial establishments that qualify as partners within the system and that support or are willing to support social institutions; however, only one response to the questionnaire was received.

The analysis was divided into three parts: the first part aims to identify the participants' profiles and understand their involvement with social issues and online donation systems. The questions in this section vary according to the type of user: donor, business partner, or social institution. For example, if the respondent represents an institution, the questions will be related to the institution's activities and donation actions.

In the second part, the user received instructions on accessing the SolidarIta system through the temporary link provided in the form. After this step, the user was asked to perform a series of tasks in the system, evaluating the difficulty level found in each one. As in the first part, the tasks and questions varied according to the type of user. For example, a donor will have a list of tasks related to interacting with campaigns. In contrast, a business partner will have tasks related to registering products in the system and monitoring wish list campaigns for later delivery to the Institution.

In the third part of the questionnaire, the user answers general questions about the system, separated into two distinct groups: questions about the interface/design and the usefulness/functionality of the system. This third part aims to analyze the highlighted points for possible future improvements and also to measure user satisfaction. At the end of the third questionnaire, the user can suggest improvements to the system or report problems they faced during use.

5.1 User Profile

The first section of the survey focused on assessing the profile of the participants who responded to the questionnaire. The definition of a user profile follows the separation of the three categories already mentioned above. Each group received more targeted questions to define certain specific characteristics of their profiles.

5.1.1 Profile of Social Institutions. The distribution of types of social work carried out by the institutions that responded to the questionnaire shows that most people are involved in Education (42.9%), followed by Social Assistance (28.6%), Health (14.3%), and Public Institutions (14.3%). There were no responses related to the Environment.

Most institutions participating in the survey have been active in the social area for between 1 and 3 years (57.1%). The remaining institutions (42.9%) have been active for over 5 years. These data suggest a mix of relatively new and more established institutions, which may influence the diversity of experiences and perspectives regarding social work.

85.7% of respondents currently use platforms or applications to digitally share the institution's campaigns and actions, while (14.3%) have used these tools in the past but no longer. This result suggests a high level of familiarity and adherence to digital technologies among participants, reinforcing the potential for the new system's acceptance. Furthermore, 71.4% of institutions consider their experiences with the systems used as "Very satisfactory" and 28.6% as "Satisfactory", with no records of neutral or negative evaluations.

Finally, 42.9% of institutions frequently have difficulty raising the amount needed for their activities, while another 42.9% face these difficulties occasionally. Only 14.3% rarely have problems raising funds, and no institution said it never has.

These data indicate that fundraising difficulties are a real problem among institutions providing socioeconomic assistance to vulnerable people. SolidarIta may serve these institutions in the future since its main objective is to facilitate fundraising and help social institutions maintain their activities.

5.1.2 Partner Profile. More than 15 commercial establishments from Itajubá and the surrounding region were invited to participate in the tests through social media and messaging apps. Unfortunately, despite insistence, only one merchant was willing to respond. What happened shows that this sector of the system did not show any visible interest in the idea of the system or that it needs more publicity and a clear explanation of how it works.

The partner responded that it regularly contributes to campaigns or social causes (annually), mainly through financial donations. This establishment has a favorable profile and is committed to social actions, demonstrating interest in establishing new partnerships. However, due to the few responses, it is impossible to determine a significant pattern or trend regarding the frequency with which establishments engage in social actions or their interest in new

[20]https://github.com/NataliaMattos/Solidarita-2024

partnerships. Although positive, this data highlights the need for a larger sample for a more representative analysis.

5.1.3 Donor Profile. Regarding donors who contribute to or show solidarity with social causes as individuals, 76.9% are between 18 and 28 years old, 12.8% are in the age group of 51 years or older, and the other age groups have smaller participations, with 10.3% of the representation. This shows that the majority of donors interviewed are young adults.

Most donors, 30.8%, contribute annually. Another 25.6% contribute monthly, while 17.9% donate weekly. In addition, 10.3% of the respondents contribute biannually, and 15.4% do not contribute to social causes. These data suggest that, while there is a significant group of regular donors, both monthly and weekly, a notable proportion of people contribute less frequently or not at all, highlighting the importance of strategies that encourage more frequent giving.

It can be seen in Figure 9 that 59% of respondents contribute to social causes with financial donations. In addition, 43.6% get involved as volunteers, 41% share information about social causes, and 33.3% participate in charity events. Only 10.3% do not contribute in any way.

This data indicates that financial donations are the most common form of contribution, but there is also a strong involvement in volunteering and information sharing. Thus, it can be inferred how much the system's functionalities can make sense, aligning with the users' existing habits.

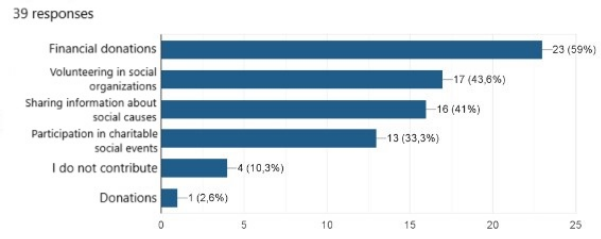

Figure 9: How do you contribute to social causes (check all that apply)?

Finally, Figure 10 shows that most people contribute through volunteering in organizations or events (51.3%) and participating in campaigns and social events in person (46.2%). Donations online on specific websites are made by 38.5%, and 30.8% use social networks. Only 12.8% do not contribute. These data show the potential that a system that centralizes different forms of help has in maximizing impact and facilitating the participation of a larger audience, meeting different contribution preferences.

5.2 Functionality Testing

The second section of the evaluation refers to the tests carried out on the system to assess the functionality and interaction between the system and the user. This phase also follows the division between user types and establishes a specific list of tasks for each type. Each user should perform all the tasks on the list and assess the difficulty of performing them in the system. This stage aims

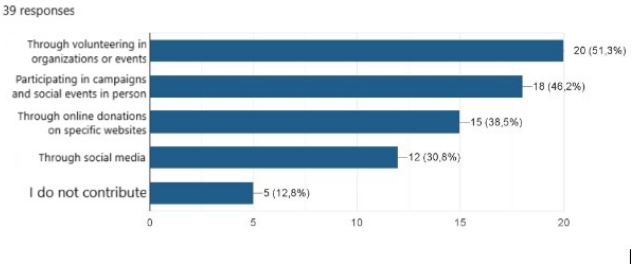

Figure 10: By what means do you usually make your contribution?

to identify whether the functionalities are easy to use in all the system's main flows.

5.2.1 Institution. Figure 11 presents the results of the functionality tests performed by the institutions:

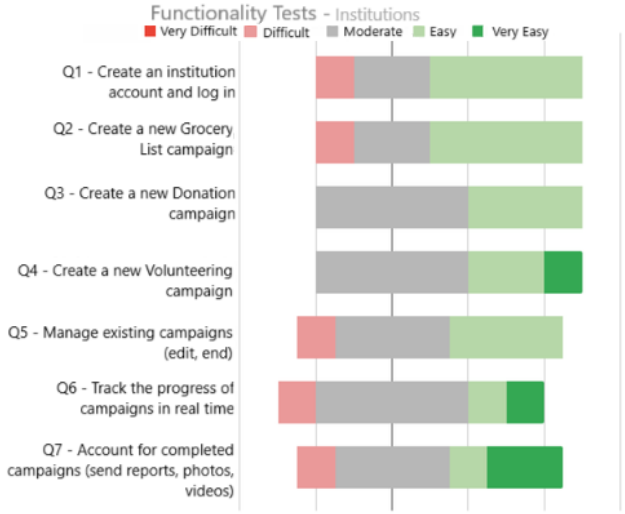

Figure 11: Functionality Test Results - Institutions

The survey with Institution users revealed that, in Task 1, 57.1% found registration and login easy. In comparison, 28.6% found it moderate, and 14.3% found it difficult, suggesting that the process is well-defined but could be improved. In Task 2, for creating new Wish List campaigns, 57.1% found it easy, 28.6% moderate, and 14.3% difficult, indicating a functional system with room for optimization. In Task 3, 42.9% found it easy to create Donation campaigns, and 57.1% moderate, with no extreme difficulties reported, showing that this functionality is relatively well received.

In Task 4, regarding Volunteering campaigns, 42.9% found it easy or very easy, and 57.1% found it moderate, evidencing good implementation. In Task 5, the management of existing campaigns was considered easy by 42.9%, moderate by 42.9%, and difficult by 14.3%, indicating that the tools are functional but can be refined.

In Task 6, tracking campaign progress, 28.6% found it easy or very easy, 57.1% found it moderate, and 14.3% found it difficult, suggesting that the tracking interface needs to be improved. Finally,

in Task 7, reporting on campaigns was easy or very easy for 42.9%, moderate for 42.9%, and difficult for 14.3%, suggesting that the process is relatively well received but could be simplified. Overall, the features are well received, but there is room for optimization.

5.2.2 Partner. The responses from the single partner indicate that the system offers a simple interface for new partners, an efficient product registration process, facilitation of wish list campaign approval, and good management tools for partners. However, due to the limited number of responses, the analysis cannot be considered entirely conclusive.

5.2.3 Donor. Figure 12 shows the results of the functionality tests performed by the donors:

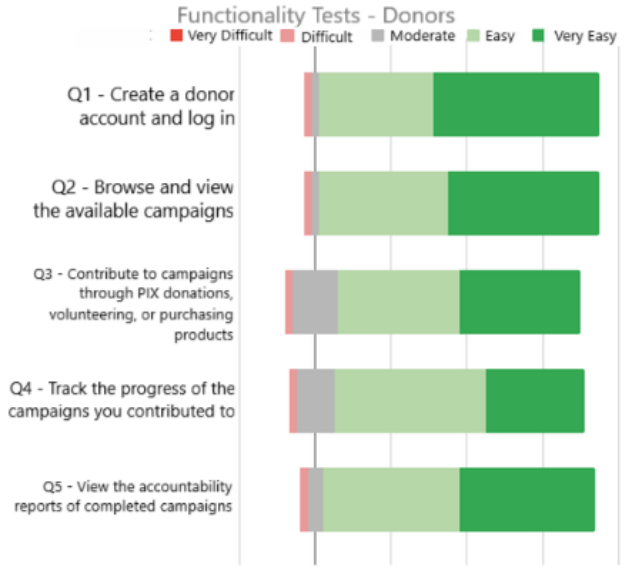

Figure 12: Feature Test Results - Donors

For tasks 1 and 2, 97.3% of users found it easy or very easy to navigate and view campaigns, while 2.6% found navigation moderate and another 2.6% found it difficult, highlighting the intuitiveness of the navigation interface. In task 3, 84.2% of users found contributing to campaigns easy or very easy, 15.8% found contributing moderate, and 2.6% found contributing difficult, indicating that the process is efficient, but there is room for improvement.

In task 4, 86.8% found it easy or very easy to track the progress of campaigns, 13.2% found it moderate, and 2.6% found it difficult, suggesting that the functionality is well received but could be refined to meet users' expectations better. Finally, in task 5, 94.7% of users found it easy or very easy to view the financial statements of completed campaigns, 5.3% found it moderate, and 2.6% found it difficult, showing that transparency in financial statements is well received, although there is still room for improvement.

When analyzing the responses to the form, it is observed that most donors are young people who demonstrate less difficulty during the analysis of the institutions, which aligns with the trend that Digital Natives use technology more naturally and intuitively. According to [2], while all generations benefit from technological tools and the vast volume of information available in cyberspace, only Digital Natives enjoy these resources in a truly intuitive way.

In contrast, Digital Immigrants face an adaptation process when appropriating new technologies, displaying a digital "accent". This difference becomes particularly evident when considering familiarity with social networks, where age plays a significant role. Consequently, young people have fewer difficulties when using the system, unlike the institutions involved, which are composed of a significant number of people less familiar with digital technologies, which may explain the more significant difficulties they have when interacting with the SolidarIta system.

5.3 Usability Assessment

The third and final section focused on assessing, based on the knowledge acquired by the interviewees, their opinions on the system's design and usefulness.

5.3.1 Interface and Design. Based on the questions in this section, Table 4 was prepared, covering all 47 responses distributed among one partner, seven representatives of social institutions, and thirty-nine donors. Table 4 relates the users' satisfaction percentage on a scale of 1 to 5 with the interface and the design, where 1 - Totally Dissatisfied, 2 - Dissatisfied, 3 - Neutral, 4 - Satisfied, and 5 - Totally Satisfied.

Table 4: User satisfaction with the interface and design

Question	1	2	3	4	5
The visual appearance of the system is attractive and professional.	0%	4.3%	4.3%	42.6%	**48.9%**
Navigation through the system is intuitive and easy to use.	0%	2.1%	4.3%	38.3%	**55.3%**
The information is presented in a clear and organized manner.	0%	2.1%	4.3%	**48.9%**	44.7%
The element's arrangement on the screen makes it easier to perform tasks.	0%	2.1%	2.1%	38.1%	**57.4%**

Table 4 reveals several strengths and areas for improvement. Almost half of the respondents (48.9%) found the visual appearance attractive and professional, a positive point. However, 4.3% were dissatisfied, showing room for adjustments in the design. Navigation was well rated, with 55.3% considering it intuitive and easy to use, with only 2.1% of responses being dissatisfied. Among users, 93.6% found the information clear and organized, and 2.1% were dissatisfied. The elements arrangement on the screen was mainly well accepted, with 57.4% fully satisfied and only 2.1% dissatisfied.

Overall, the system stands out for its intuitive navigation and layout of elements, with many satisfied users. The appearance was well-rated; however, improvements can still be made.

5.3.2 Utility. Table 5 was created based on the responses regarding the system's usability, covering all 47 responses.

Table 5 reveals several strengths and areas for improvement. Most users (57.4%) consider the functionalities offered helpful for their purposes, highlighting a strong point. However, 6.3% are dissatisfied or only moderately satisfied, indicating that some adjustments to the functionalities could be beneficial.

57.4% of respondents said the system fully meets their needs related to social issues, but 12.7% gave intermediate or dissatisfied

Table 5: User satisfaction regarding system usability

Question	1	2	3	4	5
The features offered by the system are helpful for my purpose.	2.1%	2.1%	2.1%	36.2%	**57.4%**
The system meets my needs related to social issues.	2.1%	2.1%	8.5%	29.8%	**57.4%**
The system facilitates interaction and collaboration between institutions, establishments, and donors.	2.1%	2.1%	6.4%	34%	**55.3%**
The system contributes to increasing engagement and participation in social causes.	2.1%	2.1%	6.4%	25.5%	**63.8%**
The system offers relevant and up-to-date information about campaigns and social institutions.	2.1%	2.1%	4.3%	34%	**57.4%**

responses. This suggests the system could benefit from improvements to better meet social needs.

Facilitating interaction and collaboration between institutions, establishments, and donors was well received, with 55.3% fully satisfied. However, 10.6% gave intermediate or dissatisfied responses, indicating that collaboration could be improved.

The system is seen as a good tool for increasing engagement and participation in social causes, with 63.8% of respondents fully satisfied, which is a positive result. However, 8.5% are not fully satisfied, suggesting that some improvements could be made to increase engagement.

Finally, 57.4% of respondents fully agree that the information in the system is relevant and up-to-date on social campaigns and institutions. Still, 8.5% are moderately satisfied or dissatisfied, indicating that the relevance and up-to-dateness of the information could be improved.

In summary, the system stands out regarding the usefulness of its features and social engagement, with many users satisfied. The main areas for improvement are meeting social needs, facilitating collaboration, and updating information.

5.3.3 Suggestions for Improvements. After completing the questionnaires, an open space was reserved for sharing suggestions.

The excellent usability of the system stands out among the comments received, and it is praised for its intuitiveness. However, observations about the design were mentioned, suggesting improvements to make it more attractive. A practical suggestion was including a field to view the password during registration, aiming to facilitate password confirmation.

In addition, among the participants' responses, the need to make the site more responsive to mobile devices was pointed out, as well as correcting errors related to profile editing and selecting quantities of items for donation. The importance of ensuring the project's neutrality in political and religious terms was also highlighted, promoting inclusion and charity for all people. Finally, suggestions for greater engagement, better organization of the campaign feed, and investment in more effective dissemination strategies were shared, aiming to improve the system further.

6 Conclusion

This paper addressed developing and evaluating a system for Civil Society Organizations and other social institutions to support vulnerable communities. Using the city of Itajubá/MG and the surrounding region as a case study, it was possible to understand the sector's demands better. Through interviews and critical analyses, these organizations' main needs and challenges were identified, which resulted in the prototype of the SolidarIta system, developed to simplify and improve the donation process.

SolidarIta was developed to facilitate the interaction between donors, social organizations, and commercial partners, allowing aid to be provided transparently and efficiently. The system includes wish lists of organizations, donation and volunteer campaigns, and financial statements. These resources aim to improve the user experience and increase participation in social activities.

The system was generally very well accepted on the basis of the data collected in the validation phase. Some of the established metrics received a few negative reviews, but the system fits well with the target audience.

Some features identified for the project were not developed and serve as premises for future work: improving the interface and design; developing marketing strategies to increase the system's visibility and attract more donors and partners; integrating new payment methods; creating an email notification system to inform users about essential actions in the system; implementing gamification features to encourage engagement, providing advantages for the most active users in the system; developing English and Spanish versions to serve other countries.

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