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EXTENDED ABSTRACT

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Donatenow: A Crowdsourcing-Based Mobile Application With Geolocation And Content-Based Filtering Algorithm

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***Abstract*—In the realm of contemporary philanthropy, the landscape of donation strategies has undergone a remarkable transformation. Donation-based crowdfunding, a strategy characterized by pooling contributions from numerous individuals, each providing modest sums, has emerged as a powerful tool to fuel projects. The objective of this study is to develop a mobile application called DonateNow, designed to establish a charitable crowdsourcing system. This innovative system integrates crowdsourcing, geolocation technology, and a content-filtering algorithm to enhance the efficacy of philanthropic endeavors. The goal is to empower individuals, especially donors, with the ability to discern appropriate donation items and their corresponding target locations and to minimize donation wastage, ensuring that each contribution finds its intended recipient. The developmental trajectory of DonateNow aligns with agile methodologies, ensuring a streamlined and efficient project management process. The application's construction is rooted in Android Studio, while Firestore serves as its robust database foundation. The profound significance of the DonateNow application lies in its potential to bring about a transformational impact. Donors are empowered to make informed decisions about their contributions, optimizing the impact of their generosity. Simultaneously, recipients stand to benefit from a streamlining of donations, ensuring they receive only what is truly essential to their circumstances. By mitigating the squandering of resources on unwanted items, DonateNow emerges as a beacon of effective and efficient philanthropy. As the digital realm converges with the realm of benevolence, DonateNow holds the promise of reshaping the donation landscape and catalyzing positive change for both donors and recipients.**

Keywords— crowdsourcing, content-based filtering, geolocation, mobile application, donation

I. INTRODUCTION

Crowdsourcing, a concept coined by Jeff Howe in 2006, involves businesses and government agencies outsourcing tasks to a broader online community, reducing costs, and accelerating information gathering [1]. It fosters collaboration around common causes, as seen during the pandemic when information on those in need was shared, enabling assistance. Online reviews platforms like Yelp and Google Reviews exemplify crowdsourcing, where people contribute opinions about restaurants, shops, or attractions to inform others. GoFundMe, a crowdfunding platform, allows fundraising for various events and emergencies.

The proposed project aims to develop a mobile app using crowdsourcing for cloth and item donations. Recognizing that recipients may require clothing rather than money for essential needs, donors can contribute unused clothes or household items in good condition. The app enables donors to advertise items available for donation, attracting those in need. It also allows people in need, NGOs, and charity organizations to list their requirements. DonateNow utilizes geolocation and content-based filtering algorithm, showing donors and recipient the nearest place to drop or pick-up a donation.

II. LITERATURE REVIEW

In this research, a literature review is conducted to pinpoint sources and deficiencies in the existing knowledge base. This encompasses an examination of the current system, methods, and approaches applicable to the development of this project.

A. Crowdsourcing

Crowdsourcing involves gathering information, expertise, or viewpoints from numerous individuals who submit their contributions online, via social media, or through mobile apps (Hargrave, M, 2022) [2]. This approach allows individuals or companies to reduce expenses and collaborate with individuals possessing skills that their in-house teams may lack. As per Jeff Howe's Wired interview, crowdsourcing can be defined as "Delegating a task traditionally carried out by an employee to an undefined, usually extensive group of individuals" (Baker, C, 2006) [3]. For instance, Google's review feature serves as a dependable source of information compiled by various individuals.

B. Geolocation

As per Estes, B, 2016, geolocation is a method for determining or specifying a user's exact geographical position by utilizing data from their computer or mobile device [4]. Geolocation can pinpoint the location of the device, whether it's a mobile phone or a web-connected device, using sources like GPS (Global Positioning System), Wi-Fi access points, or cell phone towers. Given that these devices are associated with individuals, geolocation employs positioning systems to track a person's location down to specific latitude and longitude coordinates or, in some cases, even a physical address (Frankenfield, J, 2021) [5]. For instance, when you place an online food order through a mobile app, and it identifies the nearest restaurant to your current location, that's an example of geolocation in action.

C. Content-Based Filtering Algorithm

Content-based filtering is a popular approach in recommendation systems that leverages the intrinsic characteristics of items and user profiles to make personalized recommendations. Content-based filtering has expanded beyond traditional attributes, incorporating contextual information such as user location, time, and device. Furthermore, multimodal recommendations, which consider multiple types of content (e.g., text, images, audio), have gained traction. These approaches provide richer and more relevant recommendations in diverse scenarios (Paudel et al., 2019) [6].

D. Related Works

According to Kenton, 2019, Donation-based crowdfunding is a method of raising funds for a project by asking many contributors to each contribute a small amount. In exchange, backers may receive token rewards that become more valuable as the size of the donation increases [7]. However, for the smallest sums, the funder may receive nothing at all. This is what usually happens where there is only a platform for the crowd to donate money such as gofundme.com and a few applications for cloth or other item donation.

Ariffin et al., 2018, said that there are now some applications that use crowdsourcing concepts to connect donors and recipients of monetary donations. However, there are no facilities that can be used to connect donors of donations in the form of new or used items to those in need. The author also said that pre-survey results show that many people have used items such as cabinets, chairs, and other items that can still be used by others. However, many people, such as orphanages and nursing homes, require such items [8].

In conclusion, most donation management systems that use crowdsourcing target either money or blood donation.

III. METHODS

The methodology section outlines the approach taken to develop the DonateNow mobile application, including the development process, tools, and technologies utilized.

A. Development Process

The development of DonateNow adhered to agile methodologies, specifically Scrum, to ensure a flexible and efficient software development lifecycle. Agile methodologies were chosen due to their suitability for iterative and collaborative development, which aligns with the dynamic nature of mobile application development.

1) *Requirement Anaysis:*
The development process began with project planning phase, where the project team defined the scope, objectives, and key features of DonateNow. User stories and requirements were gathered during this phase to establish a clear roadmap for development.

2) *Design:*
   a. UI/UX Design: Designers and user experience experts worked on creating intuitive and user-friendly interfaces for the DonateNow application. Wireframes, mockups, and prototypes were developed to visualize the app's layout and navigation.
   b. Database Schema Design: In parallel, database architects designed the schema for Firestore, the chosen NoSQL database. They defined the structure for storing user profiles, donation listings, geolocation data, and other relevant information.

3) *Development*
   a. Coding and Implementation: The development phase involved writing the actual code for the DonateNow application. Developers used Android Studio, and Java to create the mobile app. They implemented features such as user registration, item listings, geolocation services, and content-based filtering.
   b. Continuous Integration: Continuous integration tools were employed to ensure that code changes were regularly integrated and tested as part of the development process. This helped identify and address integration issues early.

4) *Testing*
   a. Functionality Testing: This testing focuses on verifying whether a software application or system performs its intended functions correctly. It is a fundamental aspect of quality assurance in software development and aims to ensure that the software meets its specified functional requirements and works as expected.
   b. Integration Testing: Integration tests were conducted to ensure that different parts of the application worked together seamlessly. This included testing interactions between the user interface, database, and external services like geolocation.
   c. Usability Testing: Beta versions of the DonateNow app were released to a group of selected users, including donors and recipients, for Usability Testing. Their feedback and testing helped identify usability issues and gather insights for improvements.

5) *Deployment*
   a. Staging Environment: Before deploying the app to production, a staging environment was set up to mimic the production environment. This allowed for final testing and validation in a controlled setting.
   b. Production Deployment: Once the app passed all testing phases and received approval from stakeholders, it was deployed to the Google Play Store, making it accessible to a wider audience.

B. Tools and Technologies

The development of DonateNow relied on several key tools and technologies:

- *Android Studio:* Android Studio, the official IDE for Android app development, served as the primary development environment for building the DonateNow app. It provided essential features for code editing, debugging, and testing.
- *Firestore Database:* Firestore, a NoSQL cloud database by Google, was chosen as the database foundation for DonateNow. It offered real-time data synchronization, scalability, and robust security features, ensuring efficient data management.
- *Geolocation Services:* To implement geolocation services, the app utilized the Geolocator package for Flutter, enabling the determination of the user's location and providing information on nearby mosques and orphanages.
- *Content-Based Filtering Algorithm:* The content-based filtering algorithm was integrated into the app's search functionality. It leveraged user input to filter donation items based on their "item_type," ensuring relevant search results.

Fig. 1 illustrates the flow of the DonateNow mobile application, providing a visual representation of the user journey, including donor and recipient interactions with the app. This flowchart aids in comprehending the app's functionality and user flows, ensuring a clear understanding of its operation.

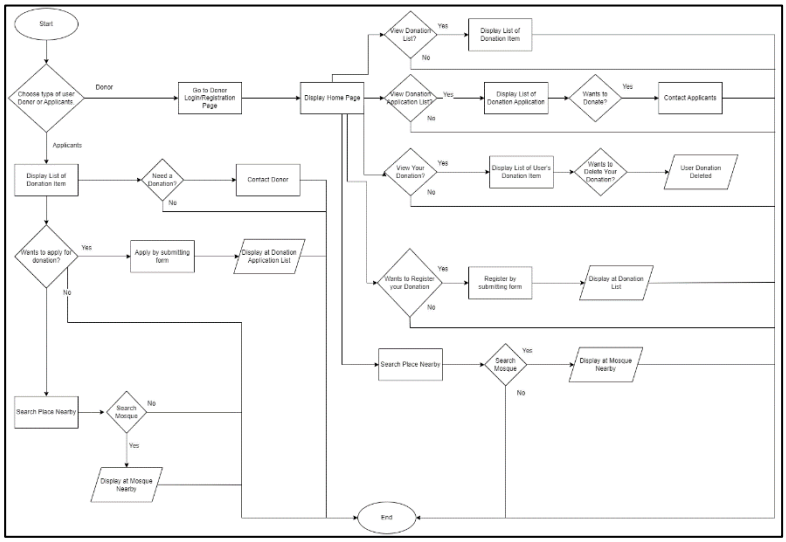

Fig. 1. DonateNowMobile Application Flowchart

IV. RESULTS AND FINDINGS

In this section, we delve into the review of the DonateNow mobile application, with a specific focus on the user interface, geolocation integration, and content-based filtering. Our analysis is grounded in the results of usability testing, which aims to evaluate the overall user experience, the effectiveness of geolocation features, and the efficiency of content-based filtering. Fig. 2 shows the interface of DonateNow mobile application.

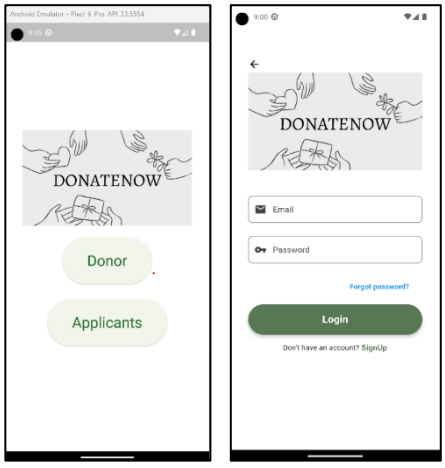

Fig. 2. DonateNow User Interface Design

A. Geolocation

The user can search mosque and orphanage in 20 km radius nearby them. When user click the “Search Mosque” button, the page will display a list of mosques nearby and if the user clicks the “Search Orphanage” button, the page will display a list of orphanages house near them. User can use this information to donate the item at mosque and orphanages house as they receive donation or they can use the donation to give to people that in-needs. The searchNearbyMosques() and searchNearbyOrphanages() methods use the geolocator package to find nearby mosques and orphanages. They do this by making HTTP requests to the Google Places API and passing the user's current latitude and longitude. The API returns a list of places that match the search criteria (mosques or orphanages within a 20 km radius), and the application then calculates the distance of each place from the user's current location using Geolocator.distanceBetween(). Fig. 3 shows

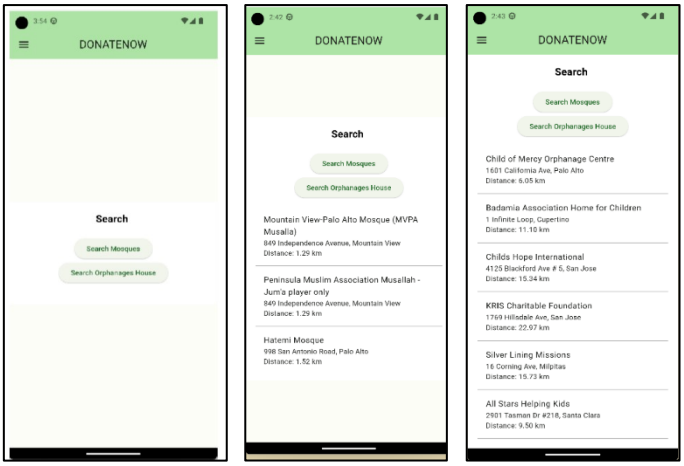

Fig. 3 Geolocation Interface Design

B. Content-Based Filtering Algorithm

The search method is using the content-based filtering algorithm to filter the content based on the item type that user type in. The content-based filtering algorithm work by using the filterData method that takes a query string as input, which represents the user's search input. If the query is not empty, it filters the data list of donations based on the "item_type" field using the where method of List. For each donation item (donate) in the data list, it checks if the "item_type" contains the query. The comparison is done in a caseinsensitive manner by converting both the "item_type" and the query to lowercase before performing the contains check. The filteredData list is updated with the filtered results. If the query is empty, meaning the user cleared the search input, the filteredData is set to the original data list. Fig. 4 shows

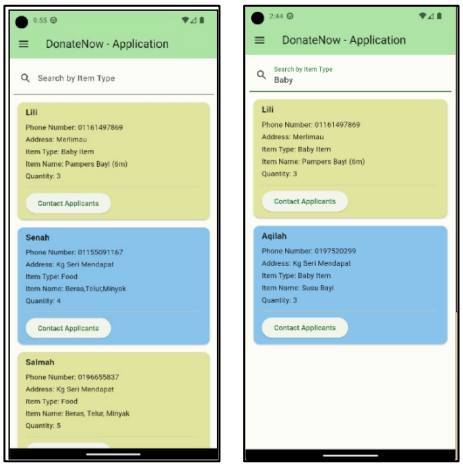

Fig. 4 Content-Based Filtering Algorithm Interface

V. CONCLUSIONS

This mobile application system was successfully develop and managed to meet the objectives and aim of the project using geolocation and content-based filtering algorithm. The objective of this project is to help donor to know what, how and where to donate and also helping the recipient to avoid wastage of donations. While the aim of this project is for both donor and recipient get to know the nearest mosque or orphanage to drop or pick up the donation and also helping both user to filtered their need based on item type on the application.

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REFERENCES

[1] Howe, J. (2006, November 8). The Rise of Crowdsourcing. Wired Magazine

[2] Hargrave, M. (2022, November 2022). Crowdsourcing: Definition, How It Works, Types,and Examples. Investopedia. https://www.investopedia.com/terms/c/crowdsourcing.asp

[3] Baker, C (2006, November 8). Q&A in Second Life: Crowdsourcing and Virtual Worlds. Wired. https://www.wired.com/2006/11/qa-in-second-li/

[4] Estes, B. (2016). Geolocation—the risk and benefits of a trending technology. ISACA Journal, 5, 1-6.

[5] Frankenfield, J. (2021, January 25). *Geolocation*. Investopedia.
https://www.investopedia.com/terms/g/geolocation.asp#:~:text=Geolocation%20refers%20to%20the%20use,whereabouts%20of%20connected%20electronic%20devices.

[6] Paudel, R., Furuya, T., & Shimizu, C. (2019). Multimodal Recommender Systems: A Survey. IEEE Access, 7, 45170-45191.

[7] Kenton, W. (2019, August 12). Donation-based Crowdfunding. Investopedia. https://www.investopedia.com/terms/d/donationbased-crowd-funding.asp

[8] Arifin, Y., Permai, S. D., Pudjihastuti, H., Dwiputra, K., Faisal, F. R., & Marcellino, M. (2018). Untukmu. Com: The Crowdsourcing Application To Leveraging The Used Of Secondhand Goods. Social Economics and Ecology International Journal (SEEIJ), 2(2)

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