A Project Report On

Food Bridge

Submitted in the Partial Fulfillment of the
Requirements for the Degree of
Bachelor of Software Engineering Awarded by Pokhara University

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STUDENT'S DECLARATION

We hereby declare that this project work entitled Food Bridge is based on our original work. All concepts, data, code, and any other work from external sources have been properly cited and referenced in accordance with the guidelines provided by School of Engineering, Pokhara University

We owe all the liabilities relating to the authenticity and originality of this project work and project report.

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SUPERVISOR'S RECOMMENDATION

This is to certify that this project report entitled Food Bridge prepared and submitted by below listed team of students in partial fulfilment of the requirements of the degree of Bachelor of Software Engineering awarded by Pokhara University, has been prepared and completed under my supervision.

I hereby recommend the same for acceptance by School of Engineering, Pokhara University.

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EXTERNAL EXAMINER'S RECOMMENDATION

The undersigned certified that they have evaluated this project report entitled Food Bridge submitted by Manish Subedi, Manoj Kumar Singh, Mitesh Lamsal, Sanket Karki, Sulav Acharya, Suraj Adhikari and their oral presentation for partial fulfillment of the degree of Bachelor of Software Engineering and recommended to the School of Engineering, Pokhara University for acceptance of this project work/report.

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LETTER OF APPROVAL

This project report entitled Food Bridge submitted by Manish Subedi, Manoj Kumar Singh, Sanket Karki, Sulav Acharya, Suraj Adhikari for partial fulfillment of the degree of Bachelor of Software Engineering has been accepted by the School of Engineering, Pokhara University upon the recommendations of Supervisor and with the approval by the following examiner.

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We also acknowledge our friends for testing and providing valuable feedback during iterations.

Finally, we are grateful to Pokhara University for providing the opportunity to undertake this project.

Abstract

The project "Food Bridge" aims to address the challenge of food wastage in Nepal by developing a user-friendly website that facilitates the redistribution of surplus food. The platform bridges the gap between food businesses with excess inventory and individuals or organizations in need of food assistance, promoting sustainability and social responsibility. The website provides real-time listing of available excess food, allowing volunteers to book and distribute the food to those in need. The project focuses on creating a community-driven approach to solving the dual problems of food waste and food insecurity in Nepal.

Keywords*: food waste, food redistribution, sustainability, social responsibility, Nepal*

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Abbreviations

CSS	Cascading Style Sheets
DBMS	Database Management System
NGO(s)	Non-Governmental Organizations
SDLC	Software Development Life Cycle
UAT	User Acceptance Testing
UI/UX	User interface/ User experience
UML	Unified Modeling Language

Chapter 1

Introduction

1.1. Background

Nepal, with its deep culture have a habit of providing foods items on every major occasion to all the relatives and even strangers. There are more than fifty festivals in a single year, and this does not even account for weddings and other ceremonies where we invite all the people we know. These food items are made such that they accommodate every person who might visit and is better made more than required such that no one is left hungry. This creates a situation of excess foods which are thrown away, creating a major problem. On the other hand, there are people below the poverty line and cannot meet the end day's food requirement. Motivated by dual problem of reducing food waste as well as providing people in need with food available, we brainstormed over this problem and on this modern age of technology and internet where adoption of technologies within city and even small communities has boomed in last few years, we decided to tackle this problem with technology itself. As the internet these days is comparatively affordable and accessible to many people, we thought to go with a website for the problem in hand. Hence to bridge the gap between these two groups of people our project was developed and named Food Bridge.

Food bridge is a platform where caterings with excess food can list their remaining food with quantity and a platform where those people with kind heart or nonprofit organizations like orphanages and elderly homes could volunteer or pick up excess food and provide it to the people who needs it. We aimed to connect there two groups of people by building a website with few bells and whistles and accomplished that goal. Our website exists on domain Khana.me for which frontend is hosted on vercel and backend is on hosted on render.

1.2. Problem Statement

Current food system has a major problem in Nepal as there exist excess food as well as struggle for food on diverse groups of people and there is no connection and

communication between people with excess and people in need. The absence of this platform for discovery and communication has led to many foods to be thrown daily and on the other hand many people sleeping without food. This leads to missed opportunities to redirect some resources and utilize and create a win-win situation for everyone.

1.3.   Objectives

The main rationale for this project is to prevent food wastage by developing a user-friendly website "khana.me."

1.3.1. General Objectives

- Address the challenge of food wastage by developing a user-friendly website, "khana.me," to facilitate the redistribution of surplus food.
- Create a platform that bridges the gap between food businesses with excess inventory and individuals or organizations in need of food assistance.
- Promote sustainability and social responsibility by encouraging the efficient use of food resources and reducing food wastage.

1.3.2. Specific Objectives

- Establish real-time platform to connect food businesses with excess food and individuals with food scarcity.
- Build a web portal that is user-friendly, and responsive to all devices such as mobile and desktop.
- Create a database to store user's and listing information.

1.4.   Scope and Limitation

1.4.1. Scopes

The scope of "Food Bridge" project encompasses following key aspects:

- **Realtime listing:** The listing of all the food on the website is real time and updates as the listing is added.

- **Development of website:** The primary focus of the project is to develop a user-friendly website.
- **Location based filter:** Users on the platform can filter the listing based on the location by just typing name.
- **Communication mechanism:** These are phone numbers of donors which are only visible after booking for the distribution of the excess food by volunteer or organization.

1.4.2. Limitations

Despite its impact on life of many people, it consists of few limitations which includes:

- **Donation verification:** There is still no way to determine the organization or volunteer who booked the excess food donated it.
- **No standard quantity for measurement:** There is lack of standard for calculating amount of food being donated by organization.
- **Lack of packaging material:** The catering company supplying the donation also should provide packaging material for food which is not ideal.
- **No notification to nearby organizations:** The implementation of notification for nearby organizations when donation is completed is not available.
- **Lack of volunteer at initial phase:** As the website is in its initial state there is major challenge of getting people onboard with whole concept of free distribution of excess food.

1.5.   Significance

"Food bridge" has enormous potential to impact individual and whole organization as well as environment.

1.5.1. Reduce food waste:

The project will eradicate loss of access to food by connecting it to the one in need.

1.5.2. Feed the needy:

"Food bridge" holds a significant potential to look after the people in need by providing them with food.

1.5.3. Support catering business:

It also provides front-page visibility on websites as well as on leaderboards for top donors as a thank you for their contribution to the community which increases their visibility and contribution towards the community.

1.6.   Contribution

The purposed platform contributes over decreasing food waste from various events and festivals and supplying excess food to those who are in need. It also fosters community engagement in social works. It will also promote more sustainable food practices.

1.7.   Report Organization

The report is organized into various chapters and sections. The sections include literature review, system analysis and design, implementation and testing, results and impact, conclusion and recommendation for future work where combined these topic covers all details about phases of software development life cycle.

Chapter 2

Literature Review

2.1. Background Study

In this era, the problem of food wastage has become a major problem where some people cannot even feed themselves and some throw away. Globally food wastage as well as poverty and hunger has been growing year by year and Nepal is not immune to this issue. Nepal is known for its culture, traditions and many festivals and as helping people is deeply rooted in our culture there is an enormous potential by connecting these two groups of people.

The stark reality of this problem of wastage of food can be seen in the aftermath of events like weddings. All the leftovers are thrown away or left to spoil. Simultaneously Nepal being a poor country, many people lack nutritional diet or on contrast some do not even get to fill up their stomach.

Recognizing this problem and increasing of use of internet and smartphones among Nepalis youth, our project aimed to develop a user-friendly website "Khana.me," which is tailored to Nepali context. This project was created focusing on bridge gap between catering and needy non-profit organization like orphanages and for individual volunteer to donate food to needy around them.

This project aimed to solve many problems like feeding needy people, saving excess food, and increasing community engagement.

In summary, the background of our project underscores the interconnected nature of food wastage, food insecurity, and sustainable development. By developing an accessible and user-friendly platform, we aspire to empower communities, businesses, and individuals to take collective action towards reducing food wastage, enhancing food security, and promoting environmental sustainability in Nepal.

2.2. Literature Review

2.2.1. Case study of successful similar web app platforms:

Existing food waste reduction models from Olio (UK) and FoodCloud (Ireland) offer a framework for connecting donors with recipients but need to be adapted to the specific social and economic context of Nepal. While data analytics tools like Winnow (Australia) can be powerful for tracking food waste patterns, their affordability might be a hurdle. Olio's research provides valuable insights into tailoring such models for Nepal, highlighting the importance of user interfaces in local languages and integration with existing donation networks. Similarly, Second Harvest Food Rescue (USA) emphasizes the importance of forging partnerships with local businesses and NGOs in Nepal. Their experience suggests that data collection and analysis tools should also be adapted to the local context to ensure effectiveness. Importantly, as noted by Joshi (2022), cultural and religious practices must be considered when designing solutions to avoid unintended consequences. For example, some religious ceremonies might involve specific food preparations, even if there's a chance of leftovers. Culturally sensitive interventions that respect these practices while promoting mindful food consumption are crucial.

2.2.2. Applications and considerations for Nepalese context

- **Food Waste in Nepal:**

Current levels: Studies by (Thapa, 2020) estimate annual food waste in Nepal at 32%, with highest losses in post-harvest (26%) and retail (21%) stages. Shrestha and Joshi (2023) highlight inefficiencies in storage and transportation leading as contributing   factors.
Economic impact: (Sharma P. S., 2021) calculate annual economic losses due to food waste at \$1.8 billion, impacting both producers and consumers. Environmental impact: (Acharya, 2022) emphasize the substantial greenhouse gas emissions associated with food waste, contributing to climate change.

- **User Adoption and Engagement:**

Trust and collaboration: Emphasizes the importance of building trust and community engagement for successful food rescue platforms.

Language accessibility: Research by (Naylor R. G., 2020) highlights the need for localization and language adaptation of platforms for wider user adoption in Nepal.

- **Adapting existing models to Nepal's significance:**

NGOs and charities: Second Harvest Nepal, Foodlink Nepal, and others distribute surplus food to vulnerable communities. However, (Shrestha) identifies logistical challenges and limited reach as key limitations. Government programs: Programs like the National Food Security Policy focus on food production and distribution but lack targeted food rescue initiatives. Informal networks: Traditional community support systems offer some degree of food redistribution but require strengthening and formalization.

- **Addressing the internet, and device limitations:**

"The Role of Technology in Addressing Food Waste in Low- and Middle-Income Countries" (Brunsdon, 2023) This paper emphasizes the need for technological solutions designed for limited internet access and mobile phone affordability in rural areas of Nepal. Tasks identified include developing offline functionality and exploring low-bandwidth communication options.

"Optimizing Food Rescue Platforms for Sustainability: A Case Study of FoodCloud (Ireland)" (Murphy, 2022) This study highlights the importance of building an efficient food logistics network and minimizing food spoilage during transport. Adapting these models to Nepal's infrastructure and climate presents potential tasks like investing in cold chain technology and exploring partnerships with transportation providers.

2.2.3. Ethical Considerations:

- **Data privacy and security:** Adherence to relevant data protection regulations and user consent procedures is essential.
- **Food safety and liability:** Clear guidelines and protocols for food handling and quality control are needed.
- **Equity and inclusion:** Platforms should avoid exacerbating existing social inequalities and ensure accessibility for marginalized communities.

2.2.4. Group Project Management and webapp development:

- **Iterative development methodologies:**

Iterative development has gained wide recognition in software development due to its flexibility, and early risk mitigation. Compared to traditional waterfall models, iterative allows small development cycles, where features can be built and added in rapid succession. (Damian, 2006) emphasizes the iterative model's ability to manage complexities and uncertainties inherent in software development projects.

- **Collaborative software development tools:**

Collaborative software development tools have become necessary in modern teams, for communication, task management, code sharing, and efficiency. Version control tools like GitHub, and GitLab hugely simplifies code collaboration.

- **Teamwork and conflict resolution:**

While working in a team, variation in ideas, and thought process is inevitable, leading to tension, and conflict in project. This carries a huge risk of project failure and must be resolved immediately. Studies by (Weingart, 2003) emphasize the crucial role of communication in navigating conflict. Open and respectful dialogue, coupled with active listening, allows team members to clarify misunderstandings, address underlying concerns, and explore solution-oriented perspectives.

Chapter 3

System Analysis and Design

3.1. System Analysis

3.1.1. System Objectives

The main objectives of the project "Food Bridge" are outlined below:

- **Real time Food redistribution:** Facilitate real-time communication of food availability and coordination between donors and volunteers for quick and efficient utilization of excess food items.
- **Community engagement:** Inspire donation and help people in need increasing overall positivity and kindness of various community and individuals.
- **User friendly interface:** A web-based simple and clean interface with minimal and focused pages on specific goals providing customized pages for donors and organization.

3.1.2. System Scope

System will cater to two roles for user: Donor and Volunteer where each user can be organization or individual. The volunteer age has options for booking the food and contacting catering which posted about donation.

3.1.3. Key Functionalities

The key functionalities include aspects of the project such as real time updating of volunteer page as soon as new food listing is posted by donor. Both donor as well as volunteer as custom page that cater according to their responsibilities, functionalities, and requirement. Also, the UI for website is clean and easy to use and provides nonfunctional aspects like dark theme.

3.2.   Requirement Analysis

3.2.1. Functional Requirements

- **Signup:** This use case allows a new volunteer or donor to register with the system.

- **Login:** This use case allows a registered volunteer or donor to log in to the system.

- **Logout**: This use case allows a volunteer or donor to log out of the system.

- **Post listing:** This use case allows a donor to post a listing of surplus food that they have available for donation.

- **Confirm distribution:** This use case allows a volunteer to confirm that they will distribute food to a donor.

- **Distribute:** This use case allows a volunteer to indicate that they are distributing food to a donor.

- **Complete distribution:** This use case allows a volunteer to indicate that they have completed the distribution of food to a donor.

3.2.2. Non-Functional Requirements

We added a leaderboard for motivation more donor organizations to join us as they would benefit by being on our front page as well as on top of the leaderboard page itself. We also make User interface / User Experience as smooth and as simple as possible. We also implemented a dark theme for users who wish to use our website at night.

3.3.   System Design
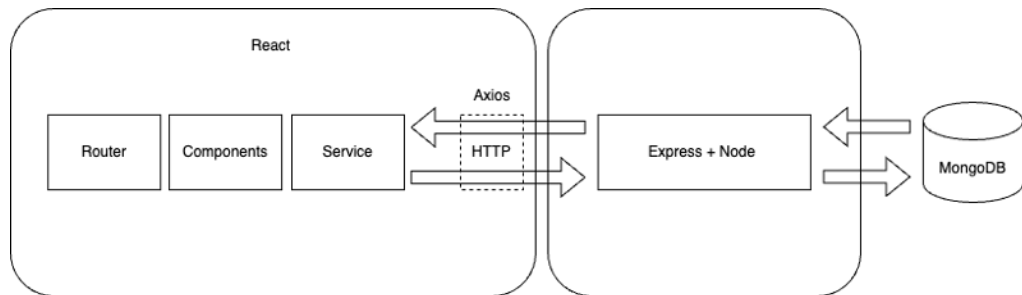
3.3.1. System Diagram/Architecture

Figure 1: System architecture of Food Bridge

3.3.2. Functionality modeling using diagram:
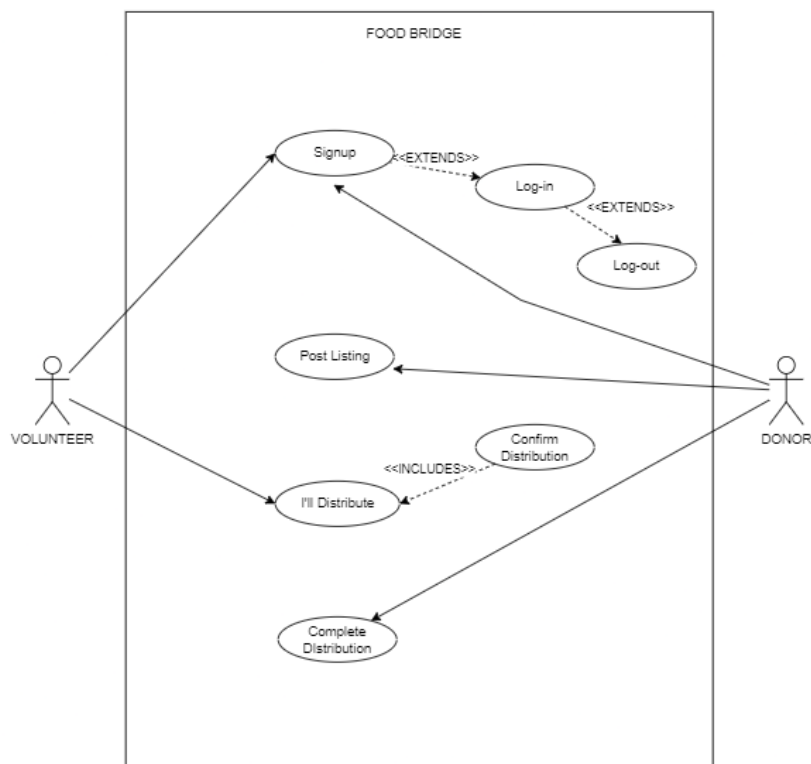
Figure 2: Use Case Diagram of Food Bridge

3.3.3. Process modeling Diagram
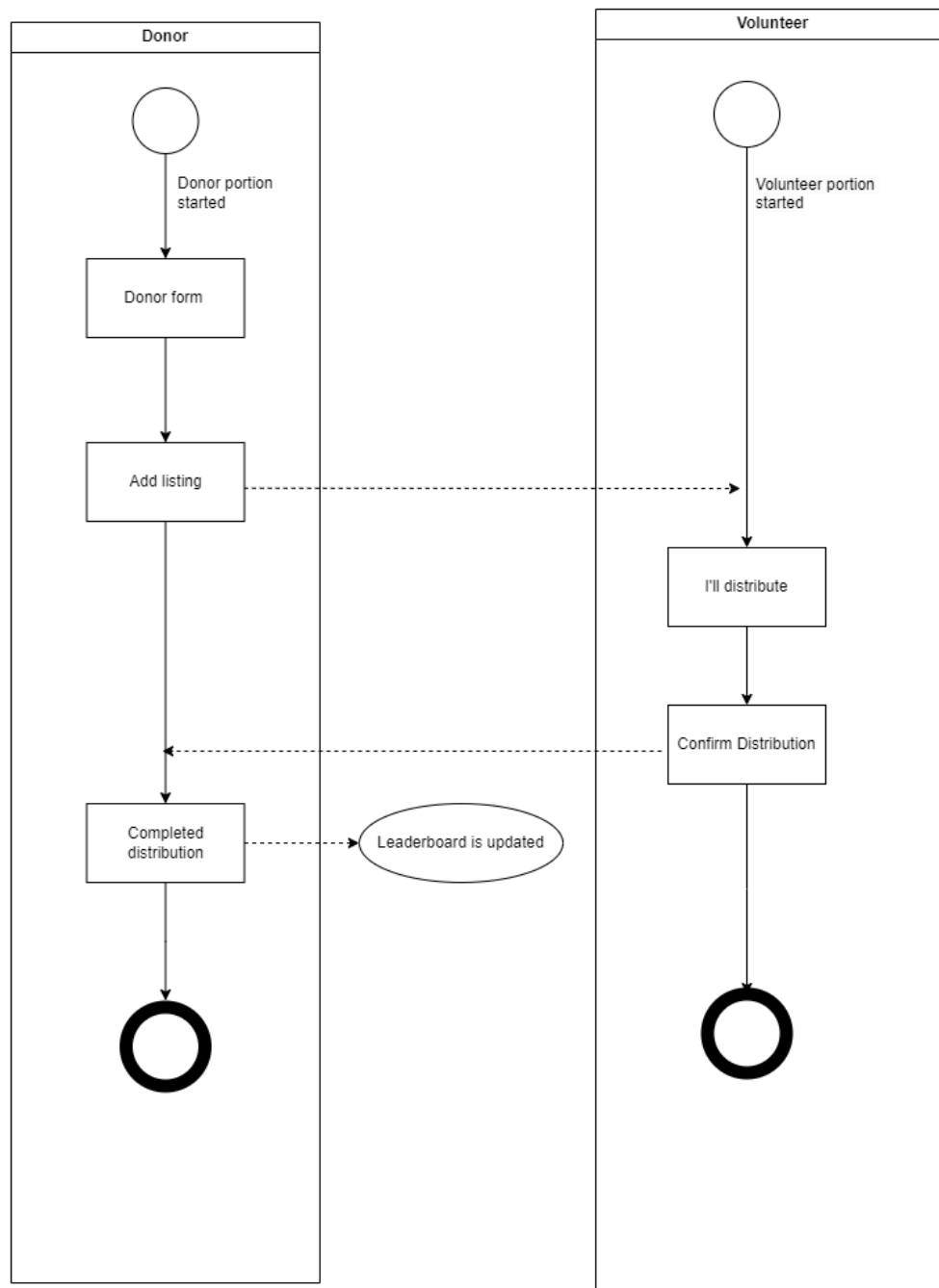
Figure 3: Process modeling diagram of Food Bridge

3.3.4. Sequence Diagram
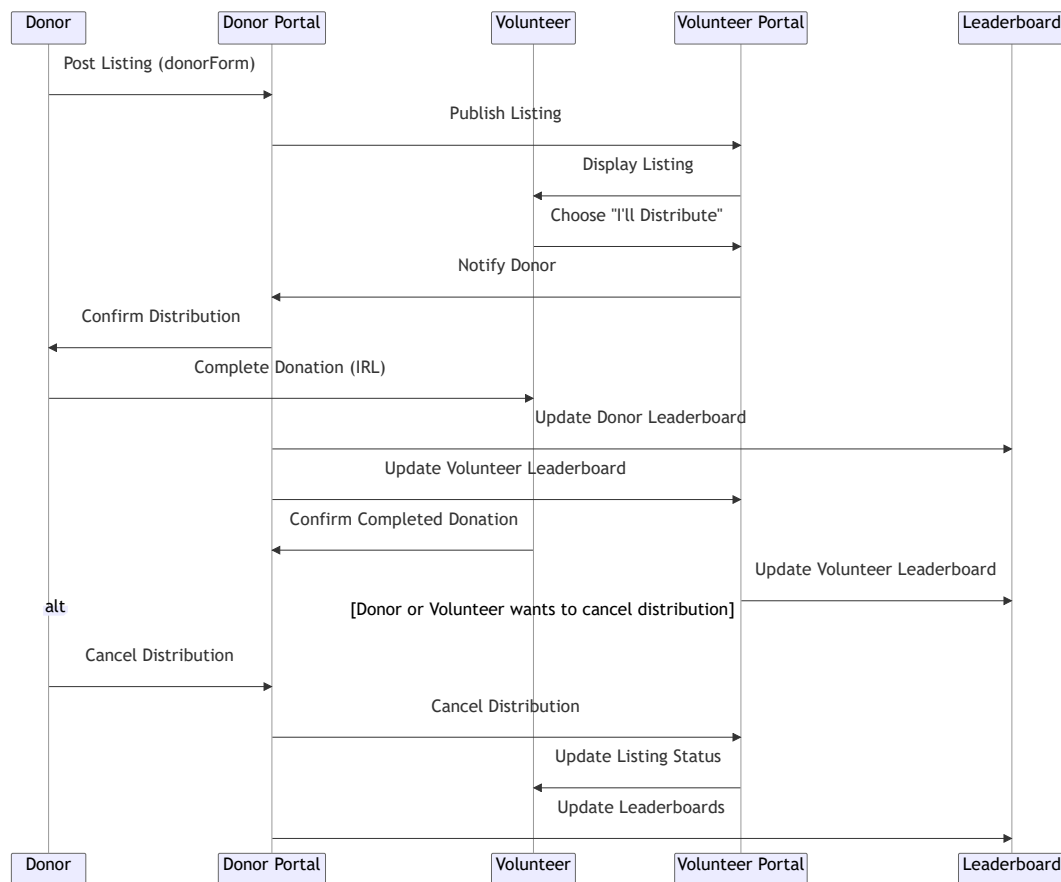
Figure 4: Sequence Diagram Development Methodology of Food Bridge

3.4. Development Methodology:

For "Food Bridge" we chose and worked on iterative prototype software development life cycle. This method served us best for building a prototype site rapidly and iterating over it to obtain final product. This methodology allowed us for continuous improvement throughout the development of our project lifecycle.
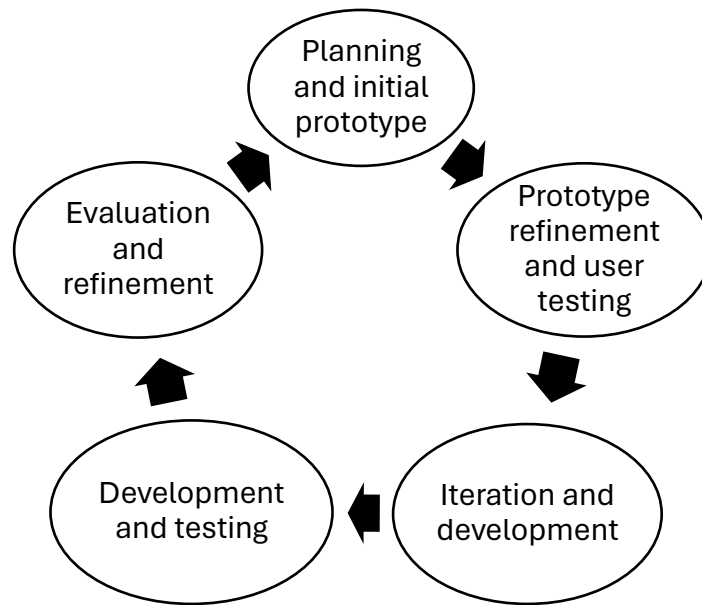
Figure 5: Phase 1 – Planning and initial prototype

Phase 1: Define core functionalities:

We started by defining the core functionalities of the app. This included things like user registration for donors and recipients, food listing capabilities, communication features, and search functionality. We also gathered initial feedback to get a sense of what users wanted.

Phase 2: Prototype refinement and user testing

Next, we refined the prototype based on the feedback we received. This involved testing the prototype with users and making adjustments based on their input.

Phase 3: Iteration and development

Following that, we iterated and developed the app further. We took the refined prototype and started building out additional features based on user needs.

Phase 4: Development and testing

In the next phase, we focused on development and testing. This meant building the core functionalities of the app while conducting iterative testing throughout the process. We also continued to gather feedback from users.

Phase 5: Evaluation and refinement

Finally, we conducted User Acceptance Testing (UAT) to ensure the app met user expectations. We gathered additional feedback during this stage and used it to iterate and improve the app further.

Planning
- Project idea and background study

Feasibility study
- Global case study
- Researches in Nepal

Workload assessment
- Team's skill analysis
- Division of work based on skill and

Platform and languages
- (in 3.2)

Front-end design
- UI/UX design
- Teams creativity
- Inspirations from other sites
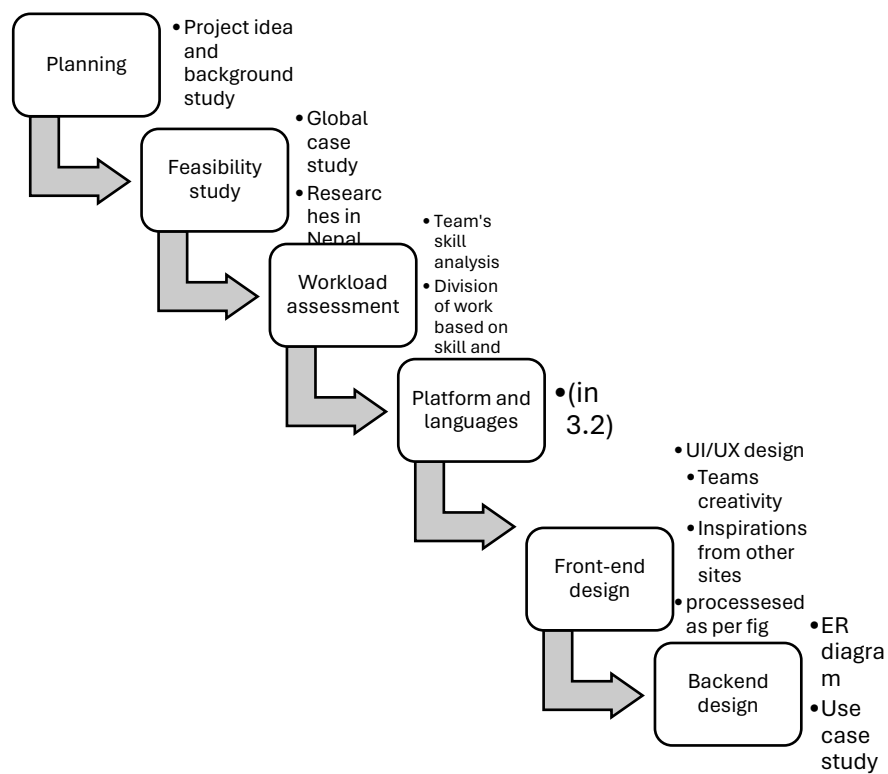- processesed as per fig

Backend design
- ER diagram
- Use case study

Figure 6: first iteration (initial prototype)

Chapter 4

Implementation and Testing

4.1. Data Collection and Dataset Used

4.1.1. Content Analysis

The findings from our content analysis played a vital role in shaping the design and functionalities of "Food Bridge" By analyzing collected data, we were able to:

- **Identify Key Needs:** Our analysis found the most important needs related to food waste reduction in Nepal. With this data, we were able to prioritize the platform features to directly address these needs and maximize impact.

- **Understand User Base:** Insights from the data on potential donors (businesses) and recipients (NGOs, communities) helped us tailor the platform's user interface and functionalities. We ensured the platform caters to the specific needs and technological capabilities of both donor and recipient groups.

- **Prioritize Functionality Development:** We prioritized the development of features that would have the most significant initial impact based on data analysis. This ensured "Food Bridge" would deliver valuable benefits from the outset.

One of the key findings from the content analysis was the lack of fixed closing time among catering businesses and event organizers in Nepal. Our data showed that this inconsistency made it difficult to accurately track and report the amount and time of excess food available for donation.

To address this, we prioritized the development of a standardized "closing time" or "expiration time" on the "Food Bridge" platform. This allowed donors to easily quantify the time of listing closing of food they had available, using predefined units and portions. This data was then displayed prominently on the platform, helping volunteers quickly assess the time available, quantity and type of food they could distribute.

By focusing on this specific need identified through the content analysis, we were able to create a more efficient system.

4.1.2. Dataset Composition

The dataset used for the content analysis comprised of various data sources, including:

- Surveys conducted with local businesses and non-profit organizations to understand the nature and scale of food waste in Nepal.
- Interviews with community leaders and representatives from food-related industries to gather insights on the challenges and opportunities for food redistribution.
- Secondary data from government reports, academic studies, and news articles on the food waste and food security landscape in Nepal.

Online research on successful food rescue platforms in other countries, their features, and lessons learned.

The dataset provided a comprehensive understanding of the target user groups, their needs, and the contextual factors influencing food waste and distribution in Nepal. This information was crucial in shaping the design and functionalities of the "Food Bridge" platform.

4.2. Implementation

4.2.1. Tools Used

- **Version control system (VCS):**

GitHub was used as version control system for "Food Bridge" as it provides a collaborative environment for multiple people. It facilitates tracking changes to codebase and facilitates code review and collaboration.
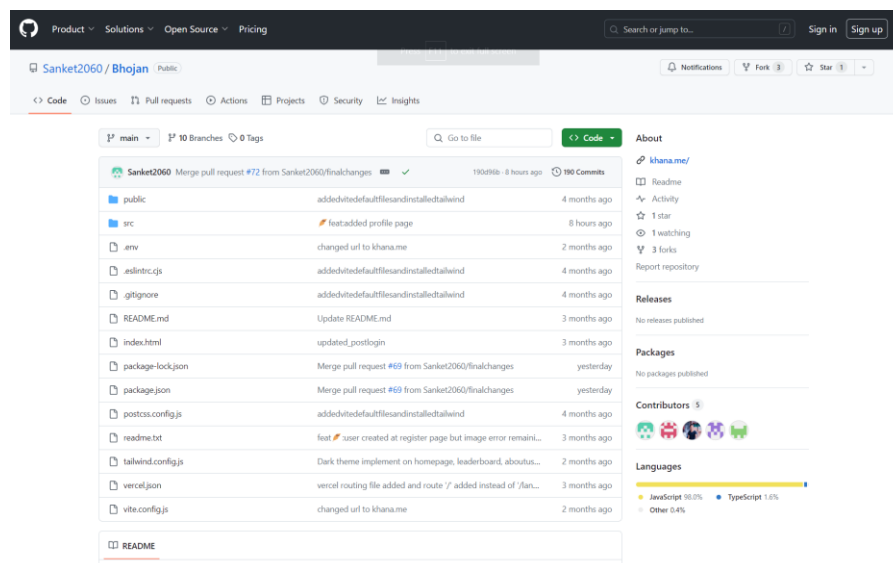
Figure 7: Version Control

- **Frontend Development:**

React JS with Tailwind for CSS was used for development of the front end of our website. Tailwind CSS provides for consistent and minimal looks for website whereas React Js and html provides for interactive UI and structure of whole website.

- **Backend Development:**

For backend we used MongoDB and express JS, and node JS.

- **Integrated Development Environment:**

For IDE we all used Visual Studio Code Editor as it provides support for extension as prettier for proper code formatting and tailwind extension for suggestion of tailwind classes. VS code is also light weight and full of many functionalities which caters to our development needs.

- **Deployment:**

For deployment of our website, we used domain from NameCheap for free domain using GitHub student developer pack. For hosting frontend of our site, we chose Vercel as it was simple and provided will all barebones and functionalities needed for our project. Our backend is hosted on Render as it provides free backend hosting service and could be easy to deploy.

- **Communication and meetings:**

We used messenger for textual communication and google meets for project meeting as it was free as well as provided us will all tool required like whiteboards and helped us collaborate and share our views and ideas easily and more efficiently.

4.3. Testing

Testing is a crucial step in software development life cycle and to ensure our platform work as we intended and it met our functional and nonfunctional requirements, rigorous testing was done, and components worked as expected as well as integration of these components.

4.3.1. What Were Tested

4.3.1.1. Functionality testing:

- **System testing:**

We tested the real-time availability of food items on the volunteer page after the donor has listed it. We also assessed the booking of a food item. We evaluated login into the site and registration of user and if constraints set on registration were working as intended or not.

- **User interface testing:**

We evaluated the UI of our project and made sure it is displayed correctly regardless of the device it is opened on. We made sure to make both mobile and desktop User interface as catered to device as possible making mobile UI larger to click.

4.3.1.2. Non-functional Testing

- **Usability testing:**

We also asked a few people to use our website and modified code and UI based on their feedback for better user experience.

- **Combability testing:**

We also did rigorous testing for our site both on mobile device and desktop device making all UI elements scalable and display correct regardless of what device it was used on. We also assessed the site on various browsers like Chrome, Firefox, Brave, Arc and Microsoft Edge and concluded it displayed UI as expected.

Chapter 5

Results and Impact

5.1. Result Analysis

Food Bridge brought various communities together for more sustainable practice and social works. This website provides the user with ability to do something good for other by volunteering or donating. The implementation of features such as location-based filtering and dark mode has further enhanced the overall usability and appeal of the platform. Also, the security features implemented are working as expected. The user-friendly interface and responsive design have ensured a seamless experience across various devices, making the platform accessible to a wide range of users.

5.2. Overall Assessment

5.2.1. Achievement of Objectives:

The main objective of the project to display a real time listing of available excess food items and create an intuitive UI was delivered upon. Also, additional functionality like the leaderboard was created to encourage more donors to join the community for helping others.

5.3. Challenges Faced:

5.3.1. Technical Challenges:

Limited development resources were a major challenge as we had a small inexperienced team. We also had problems choosing the right technologies and went through using bootstrap or tailwind or plane CSS. We concluded to go with tailwind CSS for consistency in design throughout the project. Also, for backend we had to choose to implement in MySQL or use MongoDB and went with the latter option as it more scalable and efficient overall.

5.3.2. Operational Challenges:

- **Building Initial User Base**: Attracting both donors with surplus food and volunteers or organizations in need can be difficult in the initial stages. For this we developed a system of leaderboards where top donors can be listed with their donation points which in turn would attract more people as they will appear on top, which could be a good advertisement for business.

- **Food Safety and Quality Assurance**: Maintaining food safety standards is crucial. So, we decided to put an expiration time for food would make it automatically vanish from list as its time has expired. Also new donations are added and listed at bottom of page and old are on from and top leading to old food getting more views and booked at first.

5.3.3. Strengths of the Project:

Food Bridge provides UI friendly interface specific to Nepal's context. It has a secure database with real-time update of new donations. Most of all, it is a community driven approach to solving two key issues: excess food wastage and solving food insecurity and scarcity of the needy.

Chapter 6

Conclusion

6.1. Conclusion

The user-friendly interface, real-time listing functionality, and focus on the Nepali context makes Food Bridge accessible and relevant in Nepali society. This platform's emphasis on security and its community-driven approach fosters trust and community engagement.

While challenges remain, such as tracking food distribution and expanding the user base, Food Bridge's strengths provide a solid foundation for future growth. By implementing the proposed recommendations, such as adding a food tracking feature and increasing outreach efforts, the project can further amplify its positive impact.

Food Bridge serves as a valuable model for other communities struggling with food waste and food scarcity. It demonstrates the power of technology and community collaboration in addressing complex social issues.

6.2. Limitations and Future Recommendations

6.2.1. Limitations

- **Verification of Distribution:** While the platform facilitates the connection between donors and volunteers, there is currently no mechanism to verify whether the booked food items are properly distributed to those in need.
- **Standardized Food Measurement:** The platform lacks a standardized system for quantifying the amount of food being donated, which could lead to inconsistencies in tracking and reporting.
- **Packaging Material:** The responsibility of providing packaging materials for donated food items currently falls on the catering services, which may not be an ideal solution.

- **Lack of Nearby Organization Notifications:** The platform does not currently have a feature to notify nearby organizations when a donation is made, potentially limiting the reach and efficiency of food redistribution.
- **Initial Community Engagement:** As a new initiative, attracting and engaging volunteers and donors may be challenging during the initial phases of the platform's launch.

6.2.2. Future Recommendations

- **Distribution Tracking:** Implement a system or mechanism to track and verify the distribution of booked food items, ensuring transparency and accountability in the process.
- **Standardized Food Measurement:** Develop a standardized system for quantifying and reporting the amount of food being donated, enabling better data collection and analysis.
- **Packaging Solution:** Explore partnerships or collaborations with organizations that can provide sustainable and eco-friendly packaging materials for donated food items.
- **Nearby Organization Notifications:** Integrate a notification system that alerts nearby organizations when a donation is made in their vicinity, facilitating prompt and efficient food redistribution.
- **Community Outreach and Partnerships:** Establish partnerships with local communities, non-profit organizations, and government agencies to raise awareness and encourage active participation in the Food Bridge initiative.
- **Donation Tracking and Incentives:** Implement a system to track and recognize donors based on their contributions, potentially offering incentives or rewards to encourage continued participation.
- **Expand to Other Regions:** Explore the possibility of scaling the Food Bridge platform to other regions within Nepal or neighboring countries, leveraging the existing infrastructure and lessons learned.
- **Mobile App Development:** Develop a mobile application to complement the web platform, providing users with a more convenient and accessible interface for on-the-go interactions.

- **Data Analytics and Reporting:** Implement data analytics and reporting features to gain insights into food waste patterns, donation trends, and the overall impact of the platform, enabling data-driven decision-making and continuous improvement.

By addressing these limitations and implementing the recommended enhancements, the Food Bridge platform can continue to evolve and make a lasting impact on reducing food waste, alleviating food insecurity, and promoting sustainable practices within the Nepalese community and beyond.

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Appendix A: App UI Samples

Annex 1: Landing Page of Khana.com
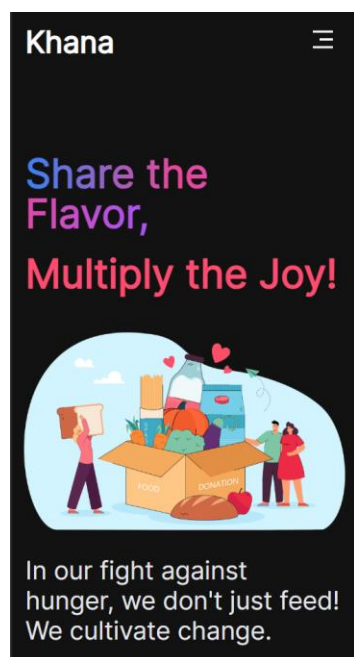
Annex 2: Landing Page of Khana.com (Narrow, Dark mode)
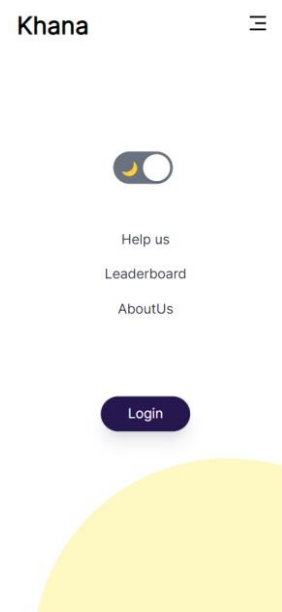
Annex 3: Hamburger Menu of Khana.com (Narrow, light mode)

Annex 4: Volunteer Page of Khana.com

Annex 5: Donor Page (Donor Form) of Khana.com (Narrow)

Annex 6: Leaderboard of Khana.com (Narrow)

Appendix B: Code Samples

```javascript
const getAllCompletedOrdersForDonor = async () => {
  try {
    if (userDetails._id) {
      const response = await axios.post(
        "https://api.khana.me/api/v1/getData/getAllCompletedOrdersForDonor",
        {
          _id: userDetails._id,
        }
      );

      setCompletedListings(response.data.data.completedOrders);
      console.log("Fetched all completed orders for donor");
    }
  } catch (error) {
    console.log("Error at getAllCompletedOrdersForDonor ", error);
  }
}
```

This function getAllCompletedOrdersForDonor asynchronously fetches completed orders for a donor. It sends a POST request to an API endpoint with the donor's ID, awaits the response, and updates the component's state with the retrieved data. Any errors encountered during the process are logged to the console for debugging.

Similar functions are used to call the API throughout the project.

```javascript
const handleCompleteClick = async (index) => {
  setCompletedItemIndex(index);
  setCompleteConfirmationOpen(true);
  await completeOrder(completingItemOrderId);
};

const onConfirmComplete = () => {
  if (onCompleteProp && completedItemIndex !== null) {
    onCompleteProp(pendingItems[completedItemIndex]);
    toast.success("Distribution Completed");
  }
  setCompleteConfirmationOpen(false);
};
```

handleCompleteClick sets the index of the completed item, opens a completion confirmation dialog, and awaits the completion of an order.

onConfirmComplete checks if there is a callback function for completion and a valid completed item index, then executes the callback with the completed item data and displays a success message. Finally, it closes the completion confirmation dialog.

```
<DistributionTable
      pendingItems={activeListings}
      onCancelDistribution={handleCancelDistribution}
      isDonorPage={true}
      isCompletedTable={false}
      onCompleteProp={handleComplete}
      cancelOrder={cancelOrderForDonor}
      completeOrder={completeOrderForDonor}
    />
```

This code snippet renders a component called DistributionTable with the following props: pendingItems, onCancelDistribution, isDonorPage, isCompletedTable, onCompleteProp, cancelOrder, completeOrder.