

Project P1: Needfinding
ITIS 6400- Human-Centered Design
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Project 12
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USER RESEARCH

Doing a prior research before jumping on to a solution is the vital part in every project. Following the same, we have started our project with some initial research having a focus towards gathering plenty of information to convert it into a formal requirements specifications for the design.

In order to complete our need finding, we started with doing in person interviews. The reason we focused to initiate in person interviews is because our use case involves actors who are poor and they are the one who are going to provide us the most beneficial information to us. In order to gather this information, it would not be feasible to go with an online survey or some other choices. Therefore, the best way to understand the user requirements is through implementing in person interviews, observational studies and interviewing the food vendors/workers which would make it more interactive and provide more use full information. Along with, we made sure proper notes are taken while one person is asking the questions.

Our project basically focuses to solve multiple inline problems in order to improvise the existing life style of the needy and making efficient quantitative processing of food in different restaurants or food producer chains. In simple words, the aim is to provide food to the needy/poor people either free or by charging some minimal amount from the restaurants/food vendors where food is getting waste on large amounts. In order to do some initial requirement analysis, we started with collecting the list of potentials users/actors involved in this use case. The actors involved in these use cases such as users, food renders [who are giving off the food], the NGO's who can connect the other two actors.

The goal here is to identify the current needs, problems, and activities that are relevant to building a computing application. This results in a motivated environment which helps you to gather information from different categorized groups keeping a focus on collection answers to different questions being asked. Having a goal and motivation helps to better understand the different users/actors and their categories in a better way. Along with, it helps to achieve on step towards the collection of initial requirement analysis documentation.

Such kind of need finding activities will help to understand the needs of the users in more efficient way. The interaction directly with the vital users of the use case helps to dig out more information and loopholes involved in the project. This can be more improved by implementing real experiments. For example, consider a poor person is hungry and he do not have enough money to buy food for him. What should be next thing going in his mind? This helps to understand the requirements and should be noted down of things he could do now. May be, he would go some near restaurants and ask for free food. At this situations, either the restaurants may be far away or nearby. What could be the situation or next steps for him if there is no restaurants nearby? So, such kind of digging out questions helps to understand about real world experiences pertaining to users.

Therefore, these in person interviews helps to reduce the gap between the high level requirements and more real world based requirements. We have jotted down the categorization and maximum questions which helped us to reveal more information from the use case when interacted with different users involved.

Categorization of potential users/actors involved in the project use case:

1. Who the users are?

- Broadly we classify the users into following categories
 - Users who are in need of food.
 - Users who can provide the food.
 - There could be other users as well such as people who are willing to do some social service and wants to lay some helping hand.
 - The restaurant owners/workers. (These users can be part of the 3rd category but to have distinct set of users we have put them in separate one.)

2. What currently they do?

- Usually, people are working and doing heavy physical work such as road maintenance, cleaning, lifting heavy packages,etc
- People having some physical disability who cannot work are mostly in need of food. These category of people don't work much.
- People running their restaurants and workers who are currently working to run the restaurants/shops.

List of potential users/actors involved:

1. Users who are in need of food are

- Poor people who can't afford food from regular restaurants: currently the poor people who have less money to spend on food, usually search for some cheap food packets who could satisfy their hunger for time being. They may grab food from some low rated restaurant which does not provide high quality food or from certain vending machines which may not have good quality food.
- Students who are on a budget constraint.
- Patients.
- Workers who work in irregular shifts.
- Other sort of people having lower income such as homeless people etc.
- People who do not like to waste foods may feel to be the users and in turn need of food.
- Even NGO's can be in need of food in order to keep their food banks working. NGO's being the mediator between the owners and people who are in actual need of food.

2. Users who supply food

- NGOs who run their food banks.
- Restaurant owners/workers who are willing to supply waste or over produced food.
- People who have excess of food cooked and are willing to share the leftover waste good food.

Interview questions asked while performing the need finding activity:

Method 1: Interview with poor/homeless people met along the roadside.

Question: Will you prefer food which is left over or certain food in cheap rate?

Responses:

Person 1:

Yes, I would prefer free food as it would help me satisfy my hunger. But how could I get? Who will provide me the food? And most important, is the food not expired?

Person 2:

No, I would not prefer left over food as I do not trust the quality of food being provided.

Person 3:

Yes/No. Depends upon what food is provided. If the food is something I like, I would have it else I would throw it out.

Question: What you do when you are hungry and don't have enough money?

Responses:

Person 1:

I would call my friends and ask to lend some money. Using same money, I would get the food.

Person 2:

I will check if anyone can provide me money [may be begging or asking for help] and use it to purchase food.

Person 3:

I will go to some nearby restaurants and check if they can provide me some money/food.

Question: What you will do if there is no restaurant nearby?

Responses:

Person 1:

I would try to get food from some nearby person or home.

Person 2:

I would ask someone to drop via lift to some restaurant

Learning from the need finding activities is surprising from what we thought at the initial start of the use case. We came across certain areas of use case where we didn't even thought. There are many other benefits our use case could provide if we enhance it. For example, what if we connect our solution project with the NGOs? They would help to connect the actors involved or even they could act as one of the actors in the use case by providing the food packets to needy people.

PROBLEM DESCRIPTION

The problem we are trying to address in this project are very critical in terms of social welfare ness. Reason for this is we are trying to address a problem related to one of the main aspect of everyone's life line that is food or any eatables. On the first glance, it may make us wonder that what problems with food are! Well, let's have overview of problem which we trying to address.

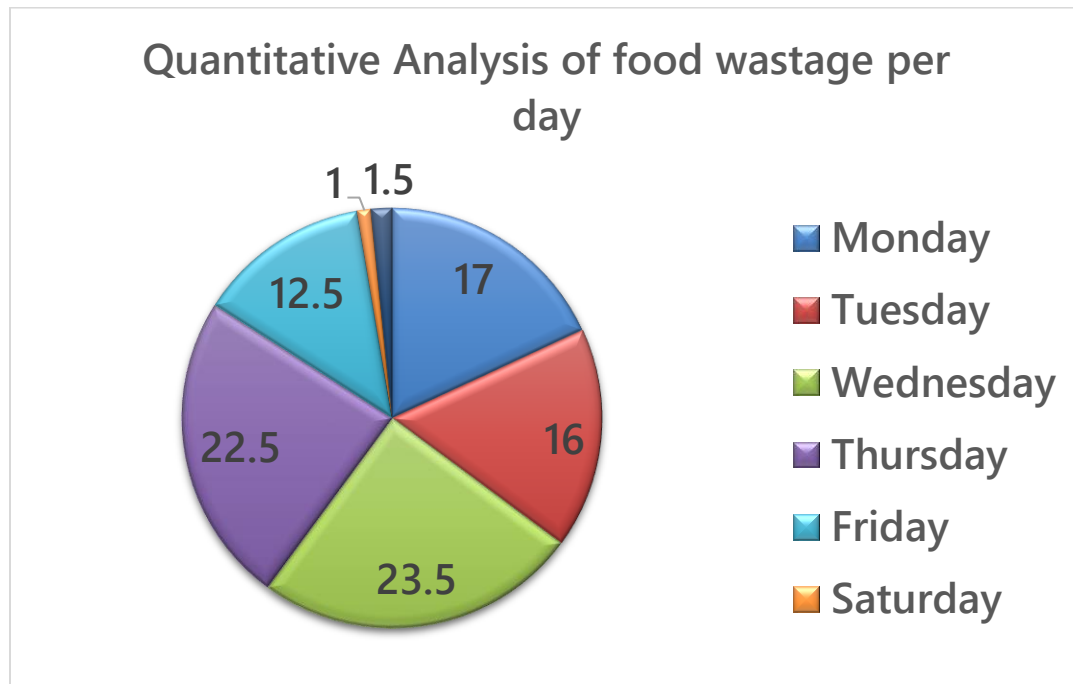
Just around the university (UNC Charlotte) area, there are many restaurants which operates from 8am to 5pm. We often see these restaurant throwing food away to trash because they almost always have excess of food left. There are many reasons for this, one important reason is the closing time, as they close between 5pm to 6pm on weekdays, and they miss out customers who need food in evening or night. Another reason is customers might not turn up as expected all the time. So, these restaurants end up wasting huge amount of food. So, food wastage is an important problem related to food.



Second problem we are trying to address may not be directly related to food, but we can say the problem occurring due to lack of food! Yes, as we mentioned previous paragraph, there are many restaurants which close very early that leaves only number of food sources available during evening and night (We are considering UNC Charlotte and surroundings). However, the demand for food by students who have classes in evening and students who are

preparing for tests, homework at library till late night or any kind of other people who need food is not reduced. Due to this, we have seen number of restaurants which are open till night serving food for extra charge compared to regular business hour. However, students, poor people who are running on budget may not always able to afford food. As a student, we have faced this problem many times.

In simple terms, we noticed two kind of problems related to food or any kind of eatables! First one, wastage of good food and second one, lack of food when needed!



Purpose of our application is to address the above mentioned two problems. We are trying to analyze the problem and come up with an effective solution / system which would help to solve the issue of food wastage as well as food scarcity when it required. Our idea is to see these problems as consumer and producer type of problem and introduce a system or interface which address these two issues. Now, let us see very brief overview of functionalities that we are trying to enable in our application which will give a clear picture about the purpose of our application.



Our application will be an interface/ portal for both restaurants/ food outlets (Producers) which closes early and for students, poor people or anyone who are in need of food (Consumes). If producers think they have food that is going to be wasted, they can update to our portal with all the required information. We update these information in real time and publish to the consumers. The consumers can visit our portal when they need food, and get it if there

availability. Since, all these activities happen in real time, there is high possibility that both parties get benefit from it.

Having the core functionalities intact, there are many other issues that our application will address. As we stated in previous paragraphs, our aim is to take food only from the restaurants which closes early so that left over food will be still good to consume, that means we are only taking what supposed to throw away. When we approached the restaurants / food outlet supervisors many of them were happy to give away the wasting food for free! However, couple of outlets expecting to impose very minimum charge to support the handling of excess food. In both the cases, consumers are one who getting benefiting. When a consumer takes food from our portal, they have to pay only if the producer imposing the charges, or they don't have to pay! Having this kind of features solves two problems that we stated in first couple of paragraphs of problem activity, those are preventing food wastage, and assisting students, or poor people to get food either for free or in affordable price when they required.

Having problem description and what our application's contribution to overcome these issue, it is also important to see why these problem arises in first place? As we mentioned few points in previous paragraphs, there are two problems here, and these are often related. However, we will dig into the reasons separately.



Food Wastage is one of the problem, at the first glance we thought reason for food wastage would be customers who order excess of food but would not be able to eat fully and trash it away. However, this is not only reason, in fact, this is not the main reason for food wastage. When we really went and interview customers, workers who works in restaurants, and supervisors regarding the how food going to be wasted, we got some interesting feed backs. Majority of people who works in food outlets thinks that expected number of customers don't turn up that's why they have to throw food away, while others blame managers /supervisors that they are not able make proper prediction about customers or due to lack of experience, along with food outlet workers many customers also think this is an important reason for this problem. However, many customers said either quality or taste of food is not up to expectation that's why many customers just taste it and throw away if they don't like it. Also, small group of customers believe that they normally eat in hurry as they might get late to work so they throw food away. Some people also think they often get bigger size boxes than they expected! Below graph (Fig 1) shows, number of people with their opinion on the question "why do you think there is food wastage in restaurants and food outlets".

Though majority people thinks that food wastage is mainly due to over expectations of customers, we thought there might be reason for this as well. When we interviewed only

supervisors and workers of restaurants around university (UNC Charlotte) area, we realized over 70 percent of food outlets and stores closes by 5pm - 6pm on weekdays and they miss out the customers who would like to come in evening/night. This gave us an overview of why there is food wastage.

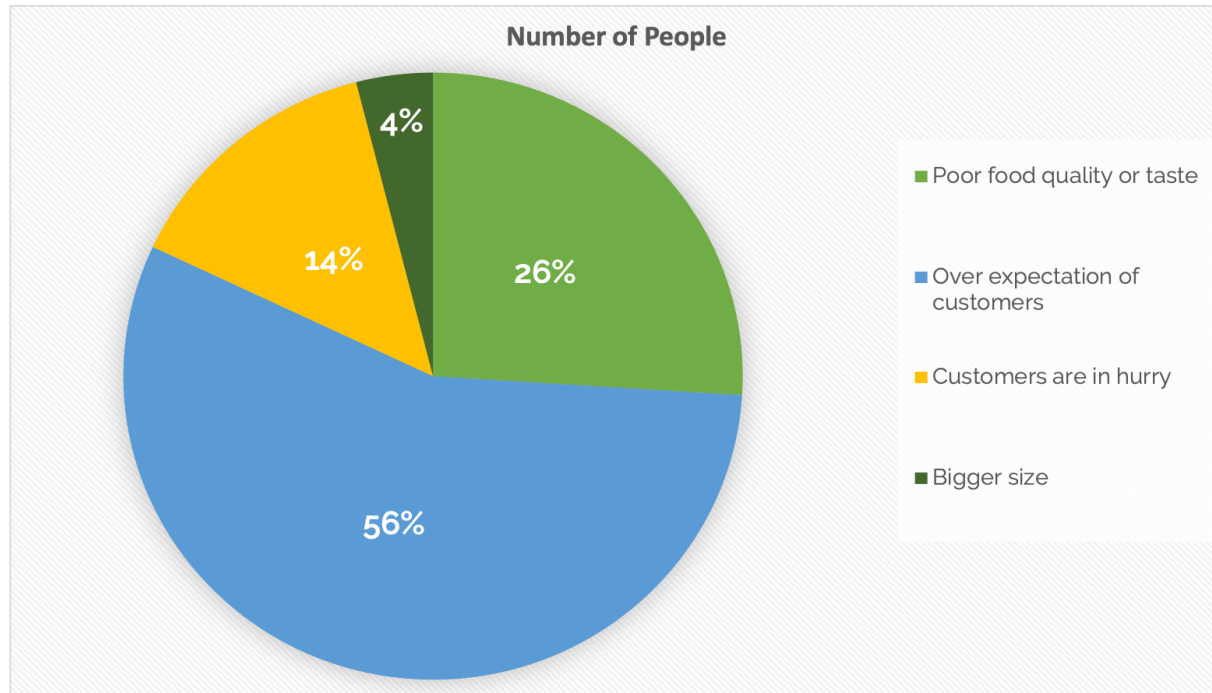


Figure 1. Quantitative analysis of reasons behind food wastage according to people

The reason for second problem we stated also, gives hint on why people say there is lack of food or way to get food when it is required. To understand if people face this problem or not, we took feedback from around 30 students, 7 working people (who works in UNC Charlotte and elsewhere in charlotte), and 5 people who roam around the gas stations (they say they are poor and may not afford three time food every day). We observed, majority of the students and poor people say that they may have to pay more for food during nights and thinks that there is lack of food when required. Half of working people also believes that some time they have to struggle a bit to get required type of food. Figure 2 depicts category of people and their opinion on food scarcity when needed. Following to this we also asked one more question, what time of the day they think they are not getting food easily. Response was similar to what we thought of, it's during evening or night! Figure 3 shows this comparison. As most of restaurants open early in morning and still open through three fourth part of the day, people get food during this time. So, evening or night when they start facing issue.

Now, we can relate reasons for these two problems, food is wasting mainly because they are not able to serve for entire day. People are not able to get food easily during night as restaurants closes early.

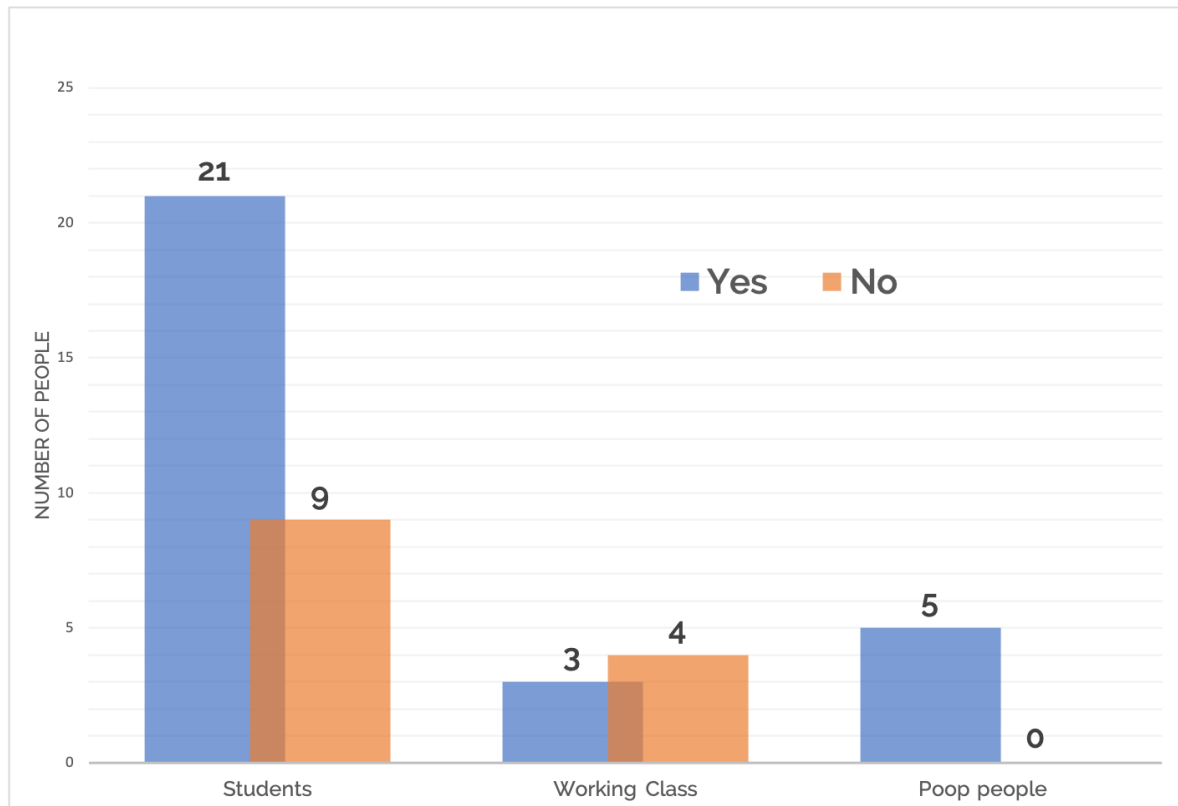


Figure 2: Survey response

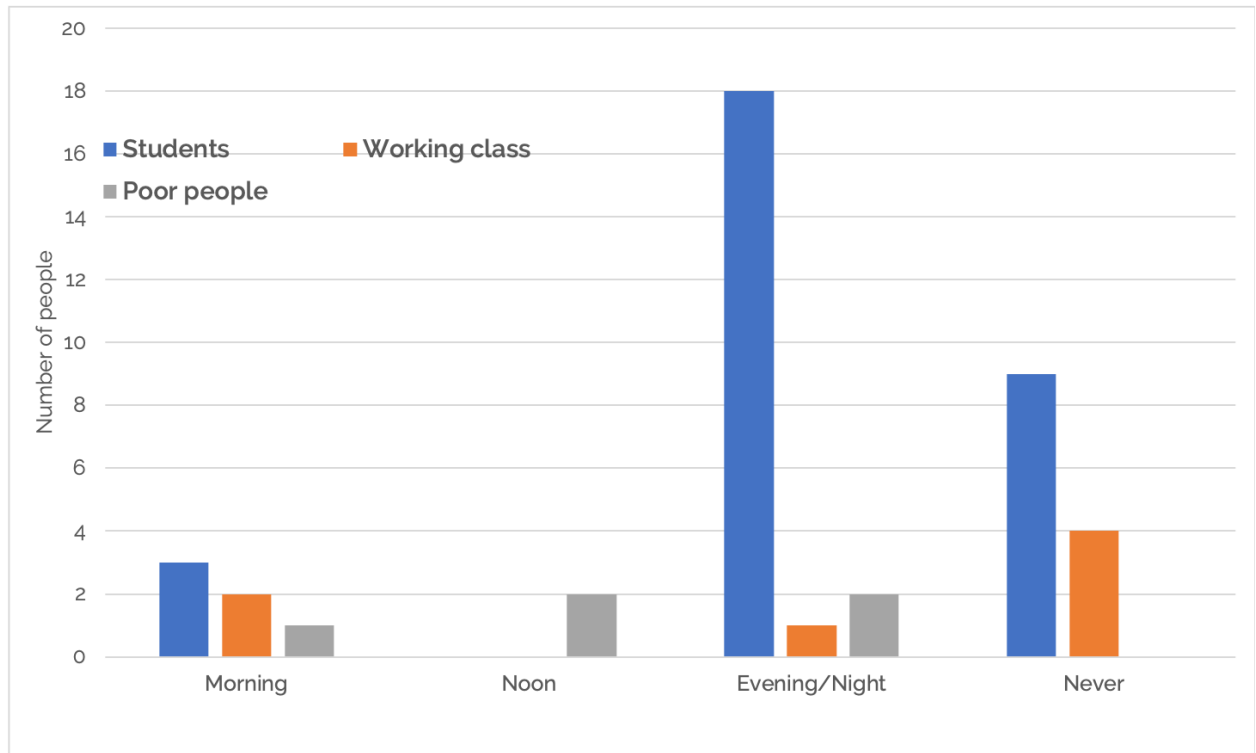


Figure 3: Timing choice according to categories.

As always, people are looking for alternative solutions to overcome problem. Many of the students get some light food from the vending machine that are installed many placed inside university. However, the issue here is they are not getting what they want or it may not sufficient for them always. Also, they have to pay little more price for it. This only can be an alternative but not the ultimate solution.

Below are the scenarios which describes the current situation of a student who needs food and a food outlet, where there is food wastage on daily basis.

Scenario 1

Alice is a student studying currently in UNCC, Charlotte. Alice is having a low budget income wherein he has to manager all his stuff within it for the month. It's the third week of the month and he is running out of his budget due to excessive expense early during the month. Today he is hungry and wants to grab some food quickly and at the same time don't want to spend much on his grocery. Therefore, he thinks to call one of his friends and take some minor loan amount in order to satisfy his month expense. Provided with the money, Alice walks out in a happy mood to search any restaurant where he can get food in cheap amount. On the way, Alice saw one Mexican restaurant where there is a board saying “discount 50%”. Alice smiles and walks towards the restaurant thinking he could get a good amount of food in cheaper rates. He checks the items which he likes and also keeping mind the amount which is there in his pocket, decides the item needs to

be purchased. At the same time, the food was ready and available to purchase with the discounted rates. The restaurant worker with a welcome smile provides the food to the hungry man and makes his day. Alice, with a full happy mood runs to the apartment and has his food.

As described in above scenario, the student able to get the food. However, he struggles, he had to take loan from a friend to afford as he was running on budget. In addition to that, he had to look for restaurants where he could get food for less price, hence he do not have many options, he had to take whatever he gets.

Scenario 2

There is a restaurant A inside the campus of UNC Charlotte, A closes at 7pm on weekdays (Monday to Friday) and closes at 5:30 on weekends. The opening time of the restaurant is 8am in the morning, they start preparing the food from 8:30am. They have two separate menus, one is pre-cooked food that usually cooked between 8:30am and 9:30 am and the second type is on demand which will be cooked as and when the order comes. Usually, they pre-cook the food for around 500 - 700 people every day. On some good days, they run out of precooked food between 4pm - 5pm. However, twice or thrice in a week, they have pre-cooked food left over for around 20- 50 people. Now, the issue is with. The restaurant supervisor doesn't want to throw away the food because they are still eatable at least till 10pm/11pm on the same day. The problem is they can't give this food for free to customers because it is against the policy of the store. So they have to throw it away by the time restaurant closes. The reason given by the supervisor is they don't know what to do.

This scenario describes how a restaurant's end up in wasting the food and they are in need of a system which takes care of this problem.

There are number of impacts due to these current activities, important among them are

Food wastage, this is very important impact that we noticed, as food is not just like other commodity that we can live without. It's a lifeline for every living thing on earth. Our idea is, when we will be able to stop this, why shouldn't do something about it?

Students, poor people or anyone who need are affected indirectly from this food wastage.

Due to the food wastage, there has been increased cost in handling the wastage food as restaurants have to spend on disposing these food.

TASK 1:

User: People who are in need of food.

High-level activity/task for the above user: Searching for food.

Subtasks:

- People searching out nearby restaurants or food service provider to get food.
- Requesting the restaurant owner to provide with food assistance.
- If there is the availability of the food, the user gets the food, he may take back and have it.
- If there is no availability of the food, the user moves to find other way to get the food. Either arrange some money and buy it.
- Searching out nearby vending machines in order to get food in a cheaper way.

TASK 2:

User: People who want to give away the food.

High-level activity/task for the above user: Giving away the excess food.

Subtasks:

- Search if there are people nearby such as homeless and NGO's nearby to give away the food.
- Simply, throw out the excess food leading to considering it as a waste of food.
- Call for volunteers or workers to take away the excess food and hand over to people in need on the way.

SCENARIOS FOR ABOVE TASKS:

- TASK-1
- The scenario which describes what consumers are doing to get food when they are in need.
- We create a separate scenario for each type of consumer such as -
 1. A student who is running on a budget, this will describe a story of students who would not have enough money to buy the food and then it also states what he/she will do in that situation.
 2. A scenario on a homeless man - this scenario describes how a homeless man managing his/her need of food at present. This describes current situation of homeless man, what they are doing for the food and what involves for them to get the food.
- TASK - 2
- The type of scenario which describes what is the current activities of people who have extra food and wants to give away.
 1. The first scenario in this category describes what a restaurant/ food outlet does when they have extra food. What they are doing in the current situation, and also how they manage to successfully give the food away.
 2. Second scenario in this category describes the current situation of a restaurant/ food outlet who doesn't have any way to give the food away for the required users and end up in wasting the food.

LIST OF ACTIVITY STEPS FOR THE SCENARIOS:

Successful scenario activity steps: Possible activity list of a student who is hungry and searching for food.

1. A student, who has run out of his monthly budget, is feeling hungry.
2. He shares this problem with his friends and/or seniors.
3. He asks their advice.
4. Seniors/friends suggest him to check the nearby restaurants.
5. They give him the list of restaurants he can check.
6. They loan out some money to the student.
7. Student thanks his seniors and friends for helping him out
8. The student walks to all the restaurants.
9. One of the restaurants is offering food at a discounted rate. The student decides to go to that restaurant.
10. He chooses the item which has the maximum discount and which also fits in the loan amount given by his friends and seniors.
11. He asks the restaurant for the availability of the item.
12. If the item is available, he asks the restaurant to pack it for him.
13. He pays the bill and exits out of the restaurant.
14. He eats the food after reaching home and is contented for the day.

Problematic Scenario: Possible activity list for a homeless man searching for food.

1. A homeless man, sitting at a traffic junction, begging for money throughout the day.
2. People passing coins or bills to him.
3. At the end of the day, he collects it all and counts it.
4. Since he has been hungry throughout the day, he walks to a nearby food vendor.
5. He sees the choices available to him.
6. Unfortunately, all the choices do not fit his budget.
7. Since he is feeling very weak, he decides not to go further to search for any other restaurant.
8. He goes back to the place where he tries to sleep for the night on an empty stomach.

DESIGN GOALS

Our design goals try to achieve optimal solution(s) for the problems faced by both Producers and Consumers. Some of the problems are determining the location of the consumers and producers, knowing details, availability and cost (incase food is chargeable) of food provided by producers, choosing the mode of obtaining food either by going to vending machine or by NGOs who deliver food, hesitation to obtain food from unknown producer. From these problems, we predicted a couple of opportunities of improvement by connecting the consumers to producers. Along with, the people who are in need should be able to find the restaurants quickly. The major opportunity is with how the food should be delivered to needy users. Our design goals target both Producers and Consumers. For each kind of users, our application has different goals.

- The application will allow the person need in food to search the availability of the food and its location. For example, the user can go through the map feature for the same.

- The application will enable the restaurant owners or workers to add the availability of the food and probably its related parameters such as quantity of food available, what type of food it is, till when it is available.
- The application will also enable the person need in food to choose the option how the food will be delivered and whether he/she himself can pick the food from the location.
- The application will allow to know the user whether there is any minimal charge for the delivery of the food charged by the restaurant owner or worker.
- The application will allow the user to rate the restaurant owners or workers based on how the service was, how helpful they were.

We have tried to come up with the list of usability goals our application should offer on the basis of overall expectations from the users we surveyed from explaining the reason why we chose them

1. **Flexibility:** Both the producers and consumer would want immediate response from each other hence creating a single system which can manage both producers and consumers is effective and advisable. It might be inefficient to use separate systems for both Producer and Consumer and making them work together will require more efforts in terms of hours. Also, creating and maintaining 2 systems will be prone to security risks.
2. **Creativity:** The application look and feel should implement creativity and out of the box ideas to make more the application more attractive and eye catching for all users. An application's USP lies in using the right amount of colors and maintaining a balance with white space and text to appease more to human eye.
3. **User-friendly:** The navigation in the application should be user-friendly. Any new person should be quickly able to navigate and learn how to use the application. Using a user-friendly application exhibits undue advantage in terms of spreading a positive reputation in between the user groups, which is a win-win situation for both producers and consumers. A complex to use application creates a negative image which is not ideal situation.
4. **Simplicity:** The content of the application will be in simple, easy to understand language using common everyday terms which people are more familiar with.
5. **Satisfaction:** After using the application, both producer and consumer should feel satisfied so that they remain encouraged to use the application again in future for their needs. A happy and satisfied user is the ultimate goal of each organization these days.
6. **Speed:** A user will definitely want the application to load faster in dire times so maintaining the speed of the application should always remain a priority while implementing new feature in future.