ONLINE FOOD COLLECTION-DONATION SYSTEM

Tribhuvan University

Institute of Science and Technology

A Final Year Project Report Submission in

Partial fulfillment of the Requirement for the degree of

Bachelor of Science in Computer Science and Information Technology

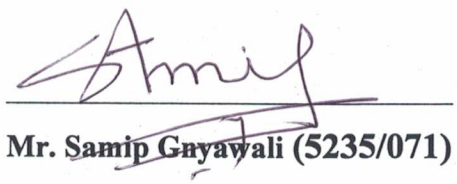
Submitted by:

SAMIP GNYAWALI (5235/071)

[September 2018]

DECLARATION

Project entitled "**ONLINE FOOD COLLECTION-DONATION SYSTEM**" which is being submitted to the Department of Computer Science and Information Technology, Dillibazar, Kathmandu, Nepal for the fulfillment of the seventh semester under the supervision of **Mr. Abhishek Dewan** his project is original and has not been submitted earlier in part or full in this or any other form to any university or institute, here or elsewhere, for the award of any degree.



Mr. Samip Gnyawali (5235/071)

RECOMMENDATION

This is to recommend that "**Mr. SAMIP GNYAWALI"** has carried out research entitled "**ONLINE FOOD COLLECTION-DONATION SYSTEM**" for the fulfillment of seventh semester final year project under my supervision. To my knowledge, this work has not been submitted for any other degree.

They have fulfilled all the requirements laid down by the Trinity International College Department of Computer Science and Information Technology, Dillibazar, Kathmandu.

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[Sep 15, 2018]

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LETTER OF APPROVAL

Date: 9/15/2018

We certify that we have read and recommended to the Department of Computer Science and Information Technology for acceptance, a project report entitled **"ONLINE FOOD COLLECTION-DONATION SYSTEM"** submitted by **Mr. SAMIP GNYAWALI** in partial fulfillment of the requirements for the degree of Bachelor of Science in Computer Science and Information Technology awarded by Tribhuvan University.

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Sep 15, 2018

ABSTRACT

"Online Food Collection-Donation System" is a web application which targets on providing food to the people in need by collecting food from different sectors including the hotels, restaurants, home and catering sectors. Food wastage not only causes the hunger issues but also cause climate changes issues. So, in order to reduce the wastage of food, to reduce the hunger issues as well as to reduce the climate changes we have come up with an idea called Online Food Collection Donation System.

As we all know that there are many restaurants and hotels where food is wasted on a daily basis. Online Food Collection-Donation System is aimed to direct this food for the good purpose or we can say that Online Food Collection-Donation System is an efficient way to use this food in the right place using technology. Food Waste Management System (FWMS) is a similar type of web application that effectively deals with management of food by collecting and distribution of food. This site provides ideas on how to manage waste food that is occurring in many sectors including hotels, restaurants, home etc.

The primary goal of this application is to ensure that the announcement of food available is made in time as well as the collection and the distribution is made in right place. It targets to narrow down the gap between the collection and the distribution of the food available without any waste. Online Food Collection-Donation System not only helps to reduce the hunger issues in the society but it also helps to reduce the waste of food and keep the balance climate by proper utilization and management of wastage food.

Keywords: *Food Waste Management, Food Collection System, Online Food Donation System.*

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LIST OF ABBREVIATIONS

BFCN	Barilla Center for Food and Nutrition
FAO	Food and Agriculture Organization
FWMS	Food Waste Management System
IFAD	International Fund for Agricultural Development
NRDC	Natural Resources Defense Council
OFDS	Online Food Donation System
U. N	United Nations
UNFAO	United Nations Food and Agriculture Organization
WHO	World Health Organization
WRI	World Research Institute

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CHAPTER 1

INTRODUCTION

1.1 Introduction

This is the era of new technologies. Although the history of Information Technology in Nepal is less than 10 years old, within these few years there has been rapid growth. The society has also adopted the concurrent changes that are suitable, Online Food Collection-Collection System is one of them.

"Online Food Collection and Donation System" is a web application which targets on providing food to the people in need by collecting food from different sectors including the hotels, restaurants, home and catering sectors. Online Food Collection System not only helps to reduce the hunger issues in the society but it also helps to reduce the waste of food. As we all know that there are many restaurants and hotels where food is wasted on a daily basis, Online Food Collection System is aimed to direct this food for the good purpose or we can say that Online Food Collection Donation System is an efficient way to use this food in the right place using technology [4].

The Food Waste Management is a similar type of web application that effectively deals with food waste. This site provides ideas on how to manage waste food that is occurring in many sectors including hotels, restaurants, home etc. World Research Institute (WRI) is a web application that worked with two of the world's largest consortia of food companies to reduce food loss and waste. The Global Agribusiness Alliance pledged to halve its food loss by 2030 and the Consumer Goods Forum committed to standardize food date labels by 2020 [2]. These bold commitments will help make food production and consumption more sustainable.

The Online Food Collection-Donation System is made as simple as possible so people will not hesitate to donate food. Doing this will allow proper utilization and management of the food that is going to be waste. Hence, this is a way to take the food that is wasting in daily basis and save it by providing a channel to get the extra food to the needy ones. This web-application helps to manage the operation of collecting and distributing foods in the systematic way. The primary goal of this application is to

ensure that the announcement of food available is made in time as well as the collection and distribution is made in right place. It targets to narrow down the gap between the collection and the distribution of the food available without any waste.

Natural Resources Defense Council (NRDC) Food Management is a web application which works to make America's food system more efficient and less wasteful. It helps cities redirect surplus food to people in need. Up to 40 percent of the food in the United States is never eaten. But at the same time, one in eight Americans struggles to put enough food on the table. So, it pushes the food industry and the federal government to put an end to confusing date labels and adopt other waste-reducing policies [6].

The Online Food Collection-Donation System has mainly three components namely Admin, Agent and Donor. Admin is the one who has full access to system including adding/deleting/approving agents, users and provide roles to agents to restrict access of all the system components. The agents can register themselves online. However, they must be approved by the admin. The agents will see approve/reject of the donor request. Agent will send notification mail to the user to notify user by saying food is collected successfully. The willing hotels and restaurants or just anyone known as donor can donate the food anytime and anywhere by using this web application. The willing party just needs to make an account or register in the site to make the donations. The registered party can make the donation by just clicking the "donate button" and providing the details about the food to be donated.

This web-application helps to manage the operation of collecting and distributing foods in the systematic way. As we all know that there are many restaurants, hotels and homes where food is wasted on a daily basis and this has become the key issues for hunger and climate changes. Hence, the main target of this web application is to collect the food from different sectors including hotels, restaurants, homes and catering sectors and distribute the food to needy ones. Hence, this is one of the efficient way to use technology to collect and distribute foods in right time and in right place in efficient manner using technology.

1.2 Problem Definition

As we all know that there are many restaurants, hotels and homes where food is wasted on a daily basis. Food wastage is the key issues for hunger and climate changes. Hotels, restaurants, homes and catering sectors are the main sources where food wastage is occurred. In simple term, food waste is unconsumed food. Food waste occurs at all stages, from food production to consumption. Food waste has negative environmental and financial consequences. Every day restaurants, hotels, catering sectors around the world throw away tons of food while many people on the same planet are dying from hunger.

Approximately $1 trillion of food is lost or wasted every for roughly one-third of the world's food. According to the United Nations (U.N) Food and Agriculture Organization (FAO), reversing this trend would preserve enough food to feed 2 billion peoplemore than twice the number of undernourished people across the globe. Consumers in rich countries waste almost as much food as the entire net food production of sub-Saharan Africa each year. If wasted food were a country, it would be the third largest producer of carbon dioxide in the world, after the U.S. and China, Roughly 30% to 40% of the food supply in the U.S. is wasted, which works out to more than 20 pounds of food per person per month [7].

In the most recent years, food waste has become a complex phenomenon attracting the attention of scientists, consumers and activists alike. It's been termed as a global paradox regarding the manner in which emphasis is put on agriculture to improve food security and then a third of all the food produced ends up as waste. BFCN (Barilla Center for Food and Nutrition) defines food waste as the waste or food losses that occur during industrial processing, distribution and consumption. According to BBFN Lack of appropriate planning, Purchase and preparation of too much food, errors in industrial processing and keeping up with food safety policies, Managerial, financial and technical constrains, Consumer behavior are main causes of food waste [5].

Food wastage not only cause the hunger issues but also cause climate changes issues. So in order to reduce the wastage of food, reduce the hunger issues as well as reduce the climate changes, the author has come up with an idea called Online Food Collection-Donation System, where the system will allow to collects the food from

different locations including hotels, restaurants, homes and catering sectors etc. and after collecting food from different sectors food will be distributed to peoples who are in need. Online Food Collection-Donation System targets on reducing wastage of food by collecting and feeding hungry people. Online Food Collection System not only helps to reduce the hunger issues in the society but also helps to reduce the waste of food and keep the balance climate by proper utilization and management of wastage food.

1.3 Objectives

The primary goal of this application is to ensure that the announcement of food available is made in a time as well as the collection and the distribution is made in right place. It targets to narrow down the gap between the collection and the distribution of the food available without any waste.

The major objectives of the project are:

- To collect wastage food from hotels, restaurants and catering sectors.
- To reduce the waste of food.
- To track all the hotels and restaurants where food is available for donation.

CHAPTER 2

LITERATURE REVIEW AND METHODOLOGY

2.1 Literature Review

Food waste is unconsumed food. Food waste occurs at all stages, from food production to consumption. Food wastage is the key issues for hunger and climate changes. Hotels, restaurants, homes and catering sectors are the main sources where food wastage occurs.

Food wastage, rather than a shortage of resources, is the key factor behind global hunger, according to the head of the International Fund for Agricultural Development (IFAD) there is more than enough food being produced to feed the world's population of over 7 billion people. Food waste does however represent a tragic loss of resources and should be addressed, therefore the lack of food management and huge food wastage is creating a hungry population [3].

The United Nations released a report saying global hunger increased from 2015 to 2016, with the number of chronically undernourished reaching 815 million people, or 11 percent of the global population. According to the UN report, global hunger is on the rise again, affecting 815 million people in 2016, or 11 percent of the global population. That marked an increase of 38 million people compared to 2015, with the rise largely due to a proliferation of violent conflicts and climate-related shocks, the report said. Asia has the largest share of hungry people with 520 million of the total, followed by Africa with 243 million and Latin America and the Caribbean with 42 million. The number of children under five suffering from stunted growth stands at 155 million, while 52 million are underweight. The report also found that 41 million children under 5 are overweight, while 641 million adults are obese [8].

The UNFA and World Health Organization (WHO) had a meeting to discuss the UN Decade of Action on Nutrition. In this issue, author publish two Comment articles that look at some of the problems. In one piece, a group of researchers stresses the importance of nourishing people, not just feeding them. And the other calls for a better approach to quantifying and analyzing different aspects of the food-production system

[10]. Between one-fifth and one-third of all food produced goes into the bin. Attention has increased on these post-harvest losses in recent years, and this week the European Commission held what it billed as the first European Union Platform on Food Losses and Food Waste. Launching the event with a speech that will be recognized by any parent who has sat with a child who won't clear their plate, Commissioner Vytenis Andriukaitis put his views regarding food waste. In provided research paper it is stated that, It is shameful to throw away food in the world where more than eight hundred million people go to bed hungry. To help promote responsible development and production of food, the UN global Sustainable Development Goals call for a number of related measures, one of which is to halve waste in the commercial and retail sectors by 2030.

According to the USDA's Economic Research Service, 40 percent of the food produced in the U.S. is wasted, so to divert excess food to those in need. It has taken almost three years for Sharma, a computer science expert and systems analyst in Iowa State University's Center for Survey Statistics and Methodology, and his collaborators to develop a software prototype Feed Hungers to do just that.

In a research done by a student in computer science on food management system. This research was published online in the journals Resources, where it was stated that those in need can find nearby locations where food is available for pickup. The researchers designed the software so donors take the food to a public place, such as a food pantry or church serving free meals, for pickup and distribution. It allows for one-time and recurring donations, so businesses or individuals do not have to enter their information repeatedly. The interactive map makes it easy to search. Each location is marked with a flag to indicate the type of food, and hours it is available. The software is made as simple as possible, so people will not hesitate to donate. There is no scarcity of food. This is a way to take the food that is wasting in daily basis and save it by providing a channel to get the extra food to the needy ones [7].

2.2 Related Study

2.2.1 Algorithm for Food Collection

In this system, author uses Insertion sort for sorting agent food donation request based on their location so that donor with nearest location will be visited first and food will be collected first. Insertion sort is a simple sorting algorithm that builds the final sorted array (or list) one item at a time [1].

The choice using insertion sort in this algorithm is that, for this system there is average number of donor available that is there is less data and it is stated that insertion is best choice when data list is medium. Below are steps for food collection using insertion algorithm.

Step 1: Start

Step 2: The input for this algorithm is list of donors d1, d2, ..., d_n along with distance dt1, dt2, ..., dt_n respectively.

Step 3: The output of this algorithm is the sorted list of donor along with the priority.

Step 3: Loop Start

- Initially, first donor d1 is sorted already so no comparison made.
- When donor d2 comes along with distance dt2, the comparison is made between distance of donor d1 and distance of donor d2. If donor d2 distance is smaller than the donor d1 distance, then swapping is done such that smaller distance of donor d2 will take the position of donor d1 place and donor d1 will take place of donor d2 place.

  Same process will be continued for new coming request of donor along with their distance Such that each coming donor request will have made comparison with already sorted donor list and if new coming request has lowest distance than already sorted distance of donor then swapping is done.

- Continue same process of comparison until all the donor comparison finished.

Step 4: Loop End

Step 5: Now the system will show the list of donors along with their distance such that donor with lowest distance will be shown first and is indicated by green line and request will be approved first so that food will be collected first. Similarly, donor with highest distance will be shown at last in list and is indicated by red line and request will be approved at last and food will be collected at last.

Step 7: End.

This illustration is shown as in figure below.

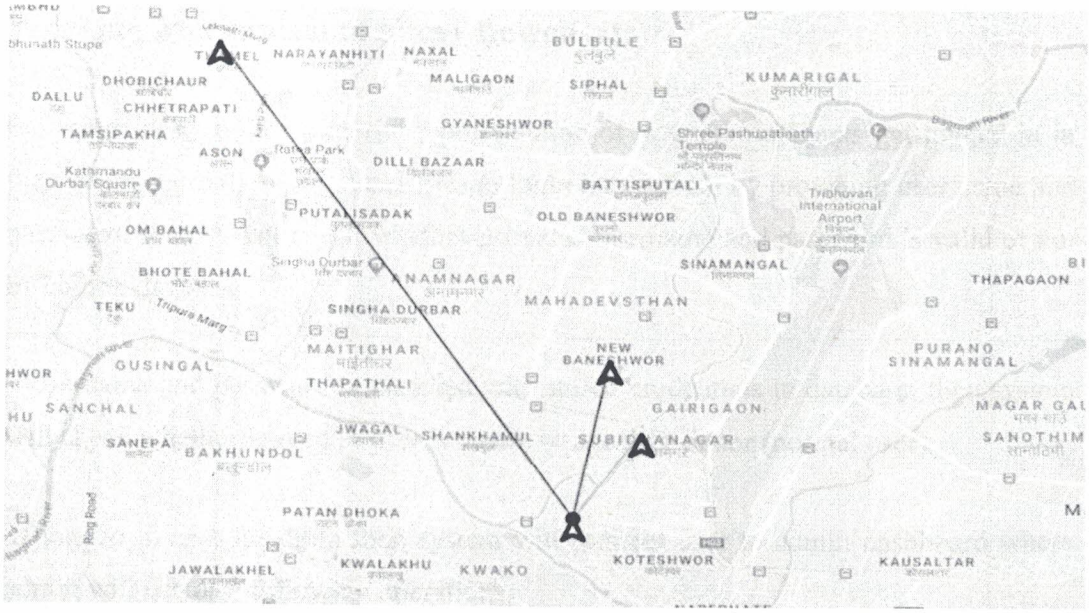

Figure 1: Insertion Sort Algorithm Implementation

2.3 Flowchart of Admin, Agent and Donor Login

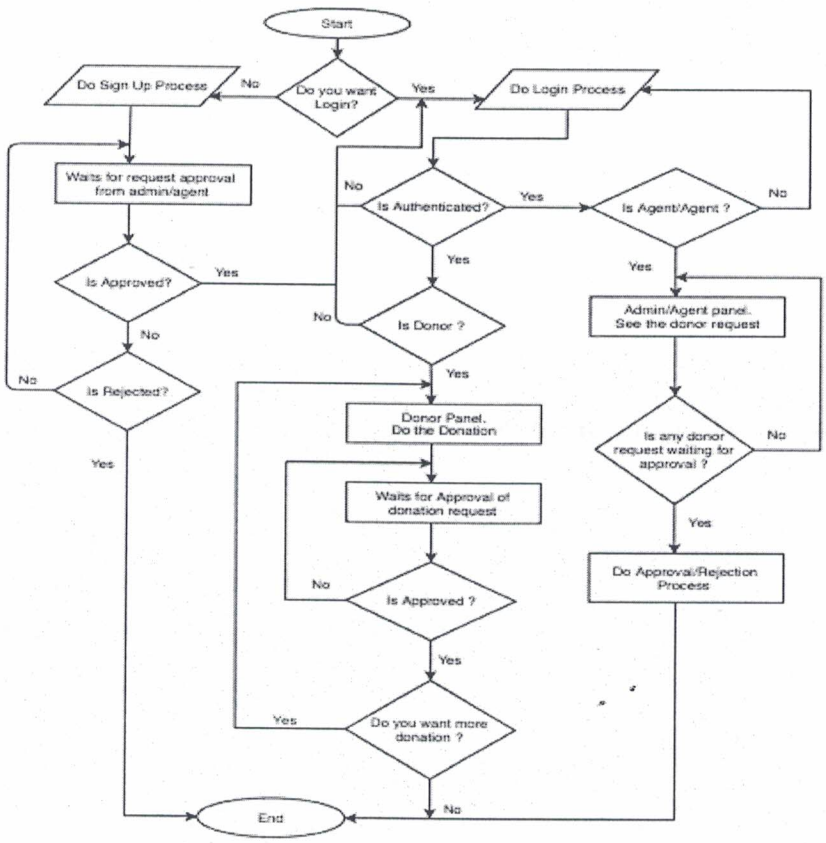

Figure 2: *Flowchart of Admin/Agent/Donor Login*

Working Mechanism of above flowchart:

Flowchart describe the pictorial representation of how admin/agents get logged in in the system. Initially when a user tries to login into system by providing user name and password, system will check whether provided username and password is valid or not by calling database.

If username and password is matched with stored credentials in database, then system will check whether logged in user is admin or agent or donor (normal user).

If logged in user is admin then system will redirect user to admin dashboard where admin will perform following operations,

- Approve/Reject food donation request.
- Assign roles to their agents.
- Approve/Reject Agent Profile Change request
- Edit/Delete the existing agents.

If logged in user is of type agent, then system will redirect to agent dashboard where agent will perform following operations,

- Collect the food.
- Distribute the food.
- See the donation request / other notifications.
- Send the food accepted request to dinners.

If logged in user is of type donor, then system will redirect to donor dashboard where donor will perform following operations,

- Make the donation request.
- Edit the user own profile.
- See the donation accepted notification.

If provided user name is not matched with stored credentials in database then system will remain in the login panel by throwing error message: Login fails, username or password is not matched.

CHAPTER 3

SYSTEM DEVELOPMENT

3.1 Hardware and Software Requirement

3.1.1 Hardware Requirements

- Pentium IV - 1.6 GHz or faster processor
- 2 GB of RAM
- 5 GB of available hard disk space ➢ Keyboard, Mouse

3.1.2 Software Requirements

- .NET Framework 4.0
- Language: C#
- Web Server: IIS
- Client Side Programming: XHTML, HTML 5, CSS, JavaScript, JQuery.
- Server Side Programming: ASP.NET
- Database: SQL Server
- Browser: Internet Explorer, Mozilla Firefox, Google Chrome, etc.

3.2 Requirement Analysis

Requirement specification provides a detailed picture of the requirements needed by the programmer for developing a project. The Software Requirement Specification provides the description of the purpose and environment for the software development. There are many things to consider while developing a well-functioning system.

Requirements may be functional or non-functional moreover, both are essential for software to be successful. Functional and non-functional requirements need to be carefully selected in order to ensure that they make sense in the context of the final outcome of the project and conveyed to all the team members working on it. A functional requirement describes what a software system should do, while non-

functional requirements place constraints on how the system will do so. The following Functional and Non-functional requirements were identified on the system.

3.2.1 Functional Requirement

The functional requirement is describing the behavior of the system as it relates to the system's functionality. It includes Business rules, Transaction adjustments and cancellations, Authentication, Audit Tracking, External Interfaces, Certification, Reporting Requirements, Historical Data, Legal or Regulatory Requirements.

Some of the functional requirements of the proposed system are as follows:

- Analysis and preprocessing of donor request.
- The system creates a platform for interaction between donors and agent/admin.
- The system provides information about the particular donors/agents.
- The system processes and generate donation request made by donors.
- The system provides necessary means for getting user's feedback.

Use Case Diagram

Use case diagram is graphical representation of user's interaction with system. Use Case diagram consist of use cases and actors and shows the interaction between them.

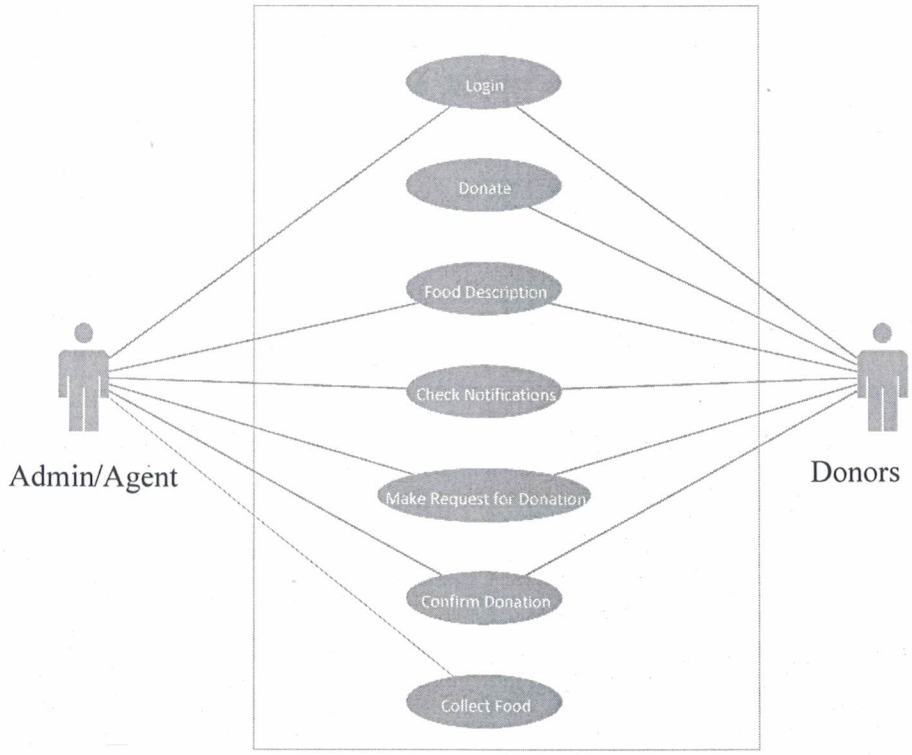

Figure 2: Use Case of Online Food Collection Donation System

3.2.2 Non-Functional Requirement

The non-functional requirement elaborates a performance characteristic of the system. Nonfunctional requirements cover all the remaining requirements which are not covered by the functional requirements [9]. They specify criteria that judge the operation of a system, rather than specific behaviors. It includes Scalability, Capacity, Availability, Reliability, Recoverability, Maintainability, Serviceability Security, Regulatory, Manageability, Environmental, Data Integrity, Usability, and Interoperability. Some of the non-functional requirements of the proposed system are:

- The response time is minimal.
- The system must be reliable.
- The system should be user friendly.
- Only authorized member has access to system.
- The system should not require much resource to operate.
- Anyone with internet connection can use the system.

3.3 Feasibility Analysis

A feasibility study evaluates the project's potential for success. Therefore, the feasibility of the system must be done throughout the life cycle of the system. The objective of the feasibility study is to ensure that a project is legally, technically, economically, and operationally feasible or not. The project feasibility study tells whether a project is worth the investment or not. The areas of feasibility that are done in this project are as below:

3.3.1 Technical Feasibility

Technical feasibility study determines whether technological resources are available or not to undertake the project.

The application is technically feasible. It is available within the given constraints. The application is a web based application built in .NET platform. The project is feasible within the limit of current technology having capacity to handle the solution.

3.3.2 Economic Feasibility

Cost and time are the most essential factors involved in this field of study. The equipment's required for the development of the application are PC and SQL servers supporting Visual Studio.

Since the application connects with donor interface, the application can be simply used by the user which does not require any cost for training of donors.

3.3.3 Operational Feasibility

It is used to identify the importance of certain problem in project and how it is to be solved. It also measures how solution of the problems will work for any project. For this project, the author provide all the support and maintains of system in case any system error occurred.

3.4 System Design

3.4.1 Architectural Design

An architectural design is the conceptual model that defines the structure, behavior, and more views of a system. An architecture description is a formal description and representation of a system, organized in a way that supports reasoning about the structures and behaviors of the system.

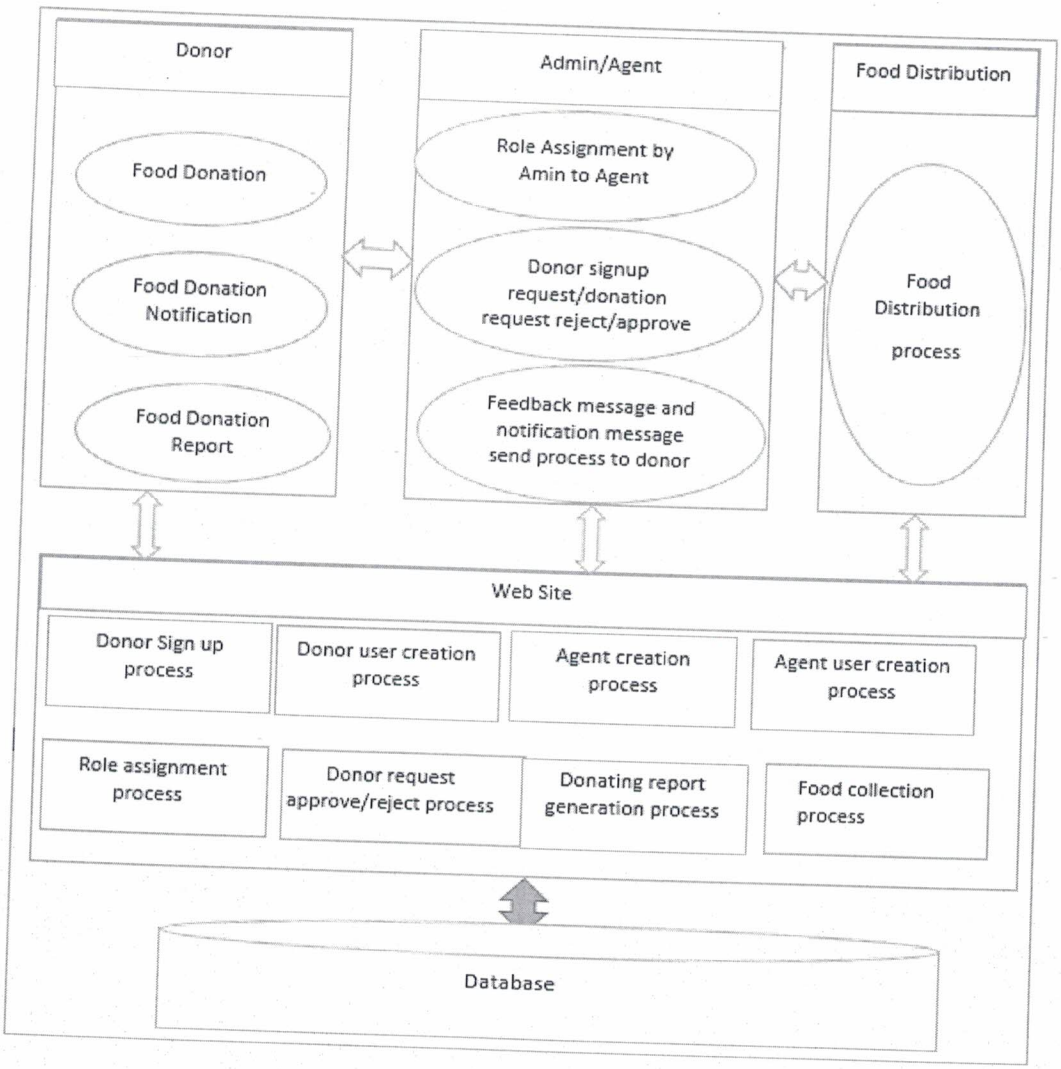

Figure 3: Architectural Design of whole system

The above mentioned figure describes overall architecture of the system where system has mainly 4 parts namely: Donor part, Agent part, Admin part and Distribution part. The donor part will interact with system in two-way process where donor will sign up first and agent/admin will approve the sign up process and provide login credentials to the donors.

The architectural design will describe system over all process about how system works. In above mentioned figure all the component will interact will system by means of website and system will perform validation form, accepting user data and saving data to database and render data to users.

3.4.2 Activity Diagram

Activity Diagram is basically a flowchart to represent the flow from one Activity to another Activity. The Activity can be described as an operation of the system.

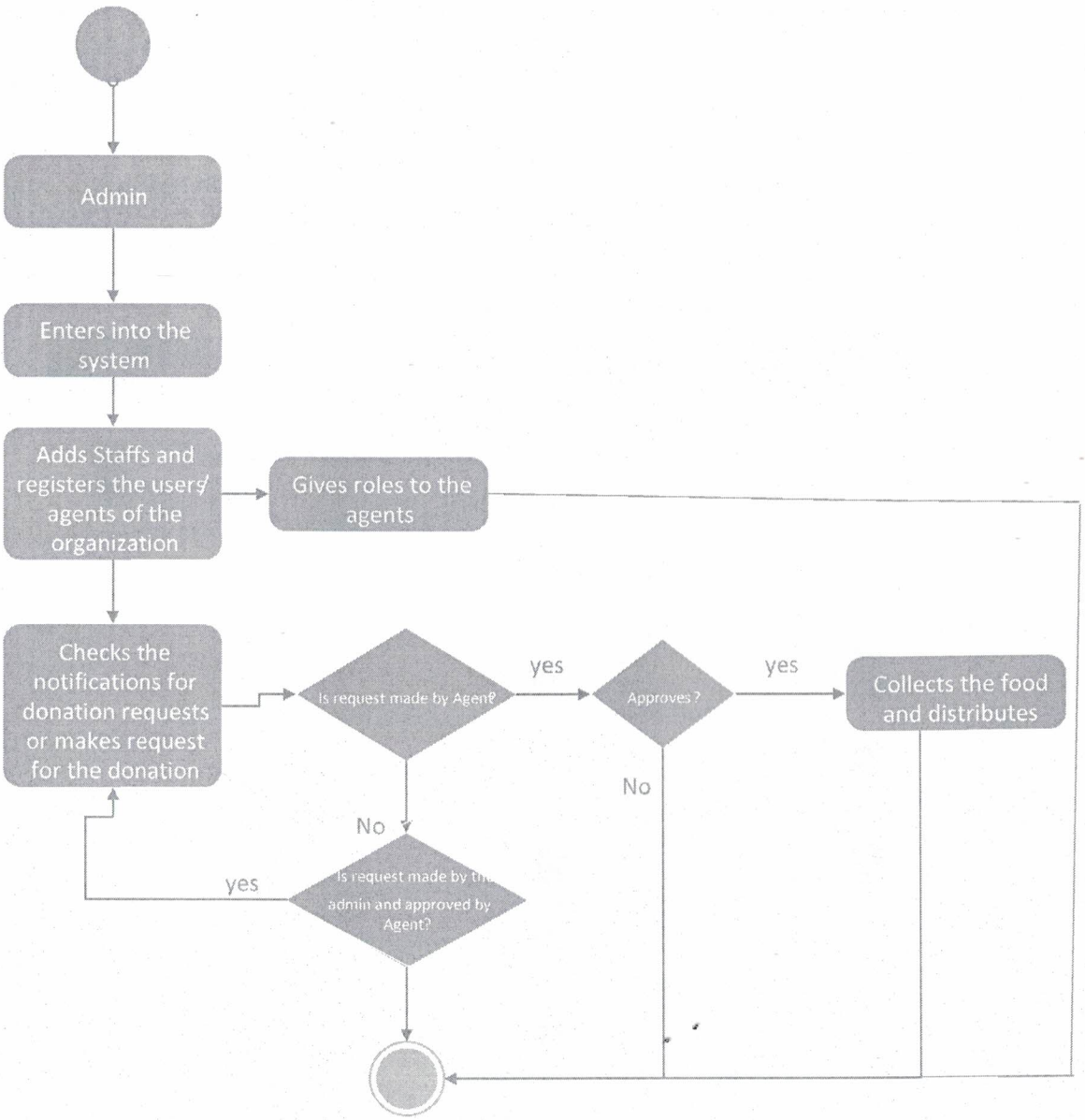

Figure 4: *Activity Diagram of Admin/Agent*

The working mechanism for activity diagram is, initially Admin enters into the system by logging username and password. Once admin logged in successfully, admin is redirected to dashboard. Admin can perform the operation of adding new users and providing them roles. The admin can also perform operation of approve/reject of the registered users. The admin panel also checks the notification and once again the staff/admin has the capability to either approve or reject the food donation request. Admin has full right to do all operation, where it is not necessary to provide role to main admin user.

3.4.3 Sequence Diagram

Sequence diagram represents the interaction between classes or objects according to time. Sequence diagram in UML is a kind of interactive diagram that shows how processes operates with one another and in what order.

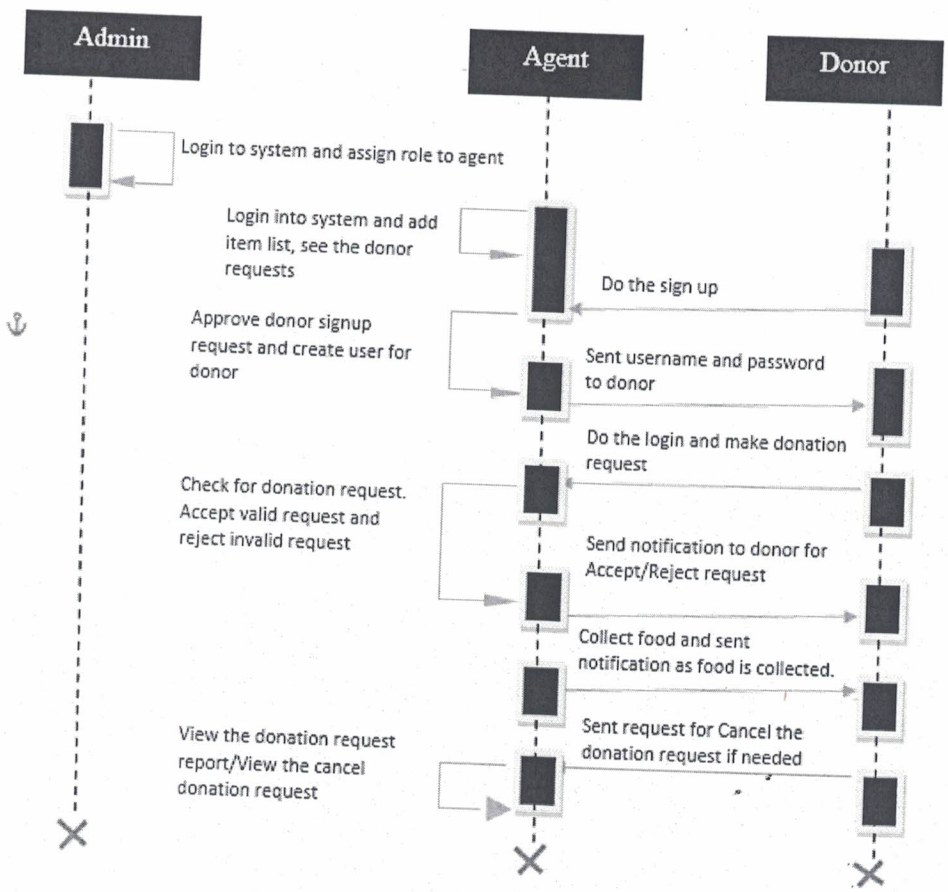

Figure 5: *Sequence Diagram*

3.4.4 Class Diagram

One of the most useful types of diagram in UML is class diagram. Class diagram will show the structure of a specified system by modeling its classes, attributes, operations and relationship between objects

A class diagram models the static structure of a system. It shows relationships between classes, objects, attributes, and operations. The main constituents of a class diagram are classes and their relationships: generalization, aggregation, association, and various kinds of dependencies. The figure below shows the class diagram of the system that consists of 14 classes.

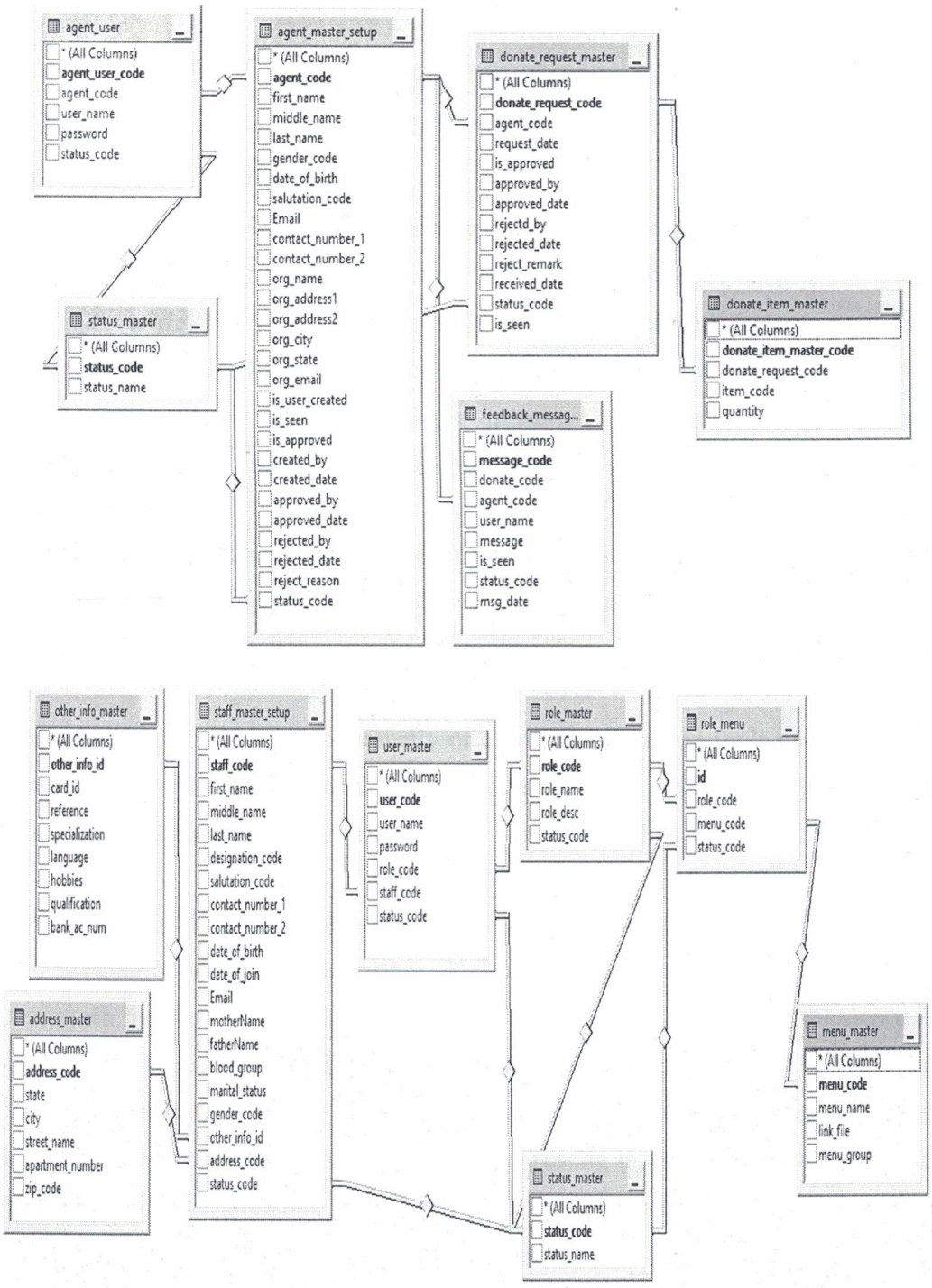

Figure 6: Class Diagram of System

CHAPTER 4

SYSTEM TESTING

4.1. Testing and Verification

Testing and verification is very important in the development life cycle of system. Once system is designed, it should be tested and verified before exposed to end user. Testing and verification allows to determine whether developed system meets the stated requirements/specifications. Actually verification is done at the starting of the development process. It includes reviews, meetings, inspection etc. to evaluate documents, plans, code, requirements and specifications.

Verification is done to determine whether the products of a given development phase satisfy the conditions imposed at the start of that phase. Testing is required for an effective performance of software application or product.

It is possible to test our system manually or automatically using tools available. For this project, author has done manual testing. By categorizing the priorities, author have done testing, for example high priority task are done first and so on.

Referring to high priority testing, author checked whether or not the registration done by user is being saved in database or not. Author verified whether or not the donation request given by donor is recorded or not. Author checked whether or not the donor is being able to request and see the food donation request. In second part, author test whether the registration part or login part form is working properly or not. Author basically checked validation part in all the forms. Testing is evaluation of the software against requirements gathered from users and system specifications. The testing strategies that were used in this project are as follows:

4.1.1 Unit Testing

First of all, each module of the project was divided into smaller modules called units. Each unit is then tested separately before integrating them into modules to test the interfaces between modules and to make sure that the individual parts were working correctly.

T-ID	Title	Expected Output	Final Result
	Login module for agent/admin/donor	Following things should be available.	
1		Textbox should be available to enter username and passport.	PASS
2		Login button should be available for login.	PASS
3		User should be allowed to enter the username and password	PASS
4		Authentication should be done at the backend to confirm the user. Possible cases for login authentication are as follows:	PASS
5		If the username and password is correct then user should be logged in system successfully.	PASS
6		If the username and password is not correct then user should allow to logged into the system and throw message saying **"Username or password wrong, try again"**	PASS
7		If user click Login button without putting username and password then system throw validation error saying **"Username and password are compulsory!"**	PASS

Figure 4: Unit Test for Login Process

4.1.2 Form Validation Testing

The form validation is a process of testing and ensuring that the user has entered required and properly formatted information through the web form and it also guide the user to fill proper and valid information. Here, test data is identified and tested, the expected output and actual result is analyzed whether there exist problems/failures or not.

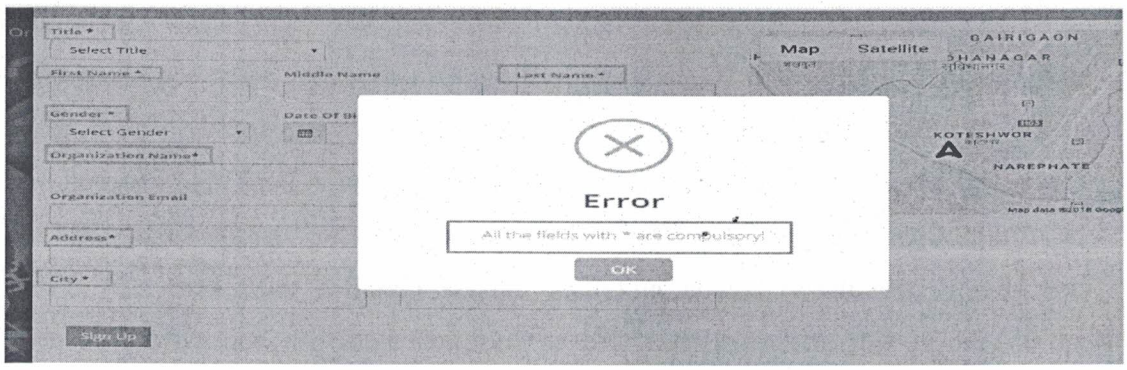

Figure 5: Form Validation for Donor Sign up

CHAPTER 5

RESULTS AND DISCUSSION

5.1 Results Analysis

The aim of the project "Online Food Collection and Donation System" not only helps to reduce the hunger issues in the society but it also helps to reduce the waste of food and manage the environment changes by collection the food from different sources including the hotels, restaurants, home and catering sectors.

"Online Food Collection and Donation System" is a web application which targets on providing food to the people in need by collecting food from different sectors including the hotels, restaurants, home and catering sectors. As we all know that there are many restaurants and hotels where food is wasted on a daily basis, Online Food Collection System is aimed to direct this food for the good purpose or we can say that Online Food Collection and Donation System is an efficient way to use this food in the right place using technology. The Online Food Collection and Donation System is made as simple as possible so people will not hesitate to donate food. Doing this will allow proper utilization and management of the food that is going to be waste. Hence, this is a way to take the food that is wasting in daily basis and save it by providing a channel to get the extra food to the needy ones. This web-application helps to manage the operation of collecting and distributing foods in the systematic way. The primary goal of this application is to ensure that the announcement of food available is made in time as well as the collection and distribution is made in right place. It targets to narrow down the gap between the collection and the distribution of the food available without any waste [11].

This web-application helps to manage the operation of collecting and distributing foods in the systematic way. As we all know that there are many restaurants, hotels and homes where food is wasted on a daily basis and this has become the key issues for hunger and climate changes. Hence, the main target of this web application is to collect the food from different sectors including hotels, restaurants, homes and catering sectors and distribute the food to needy ones. Hence, this is one of the efficient way to use technology to collect and distribute foods in right time and in right place in efficient manner using technology.

For the purposed system there are many numbers of agents who will collect food from number of donors. However, agent will collect food first from those donors whose distance nearest among all other donors from that agents, so problem is when there is more number donation request but less agent will available for collecting then there arise problem for collecting food. So we need to have analysis on the available donation request where each donation request has its location based on these locations along with distance, analysis is made as below.

Sno	Location	Donation Request	Cancel Request
1	Kanchanpur	70	30
2	Darchula	60	10
3	Baitadi	50	10
4	Kathmandu	180	40
5	Pokhara	90	20
6	Lalitpur	150	80

Figure 6: Food Donation and Cancel Request Data Collection Per Day

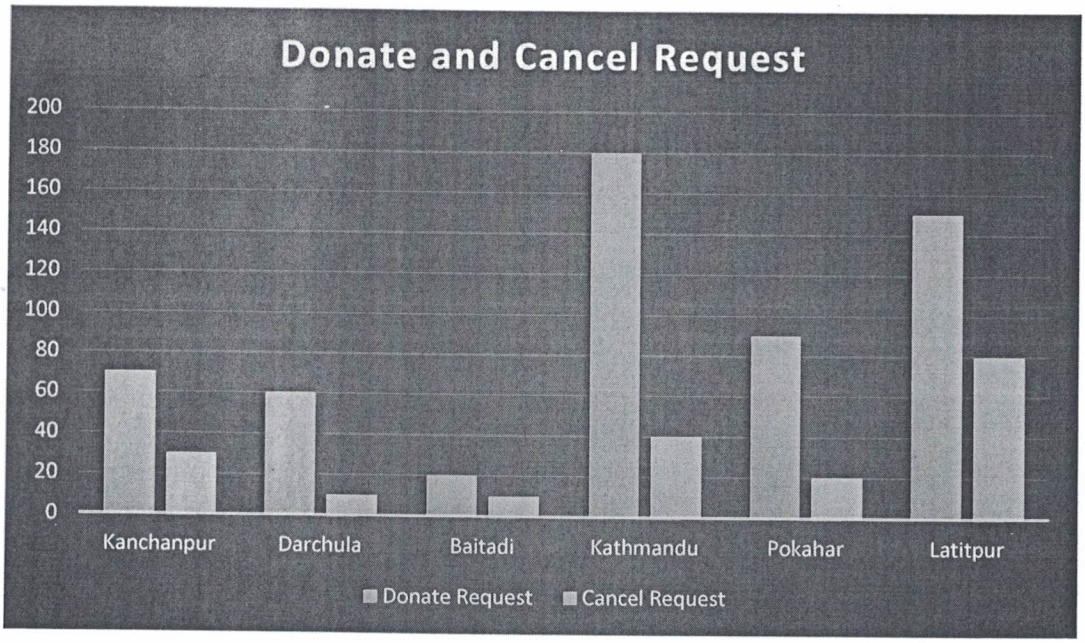

Figure 7 : Bar Chart of Food Donation and Cancel Request Per Day

The bar chart shows the food donation and food cancellation request based on the location. In above figure, there are six locations namely Kanchanpur, Darchula, Baitadi, Kathmandu, Pokhara, Lalitpur. In each location there are two request associated with it namely donation request and cancellation request.

From above Bar Chart, the analysis is done in such way that for each location the number cancellation request is subtracted from number of donation request so that total valid request will be obtained. Doing this calculation will provide maximum number of donation made to all particular location. For above system calculation is done as below.

Formula: Total Valid Request = Total Donate Request – Total Cancel Request

Sno.	Location	Donation Request	Cancel Request	Valid Request
1	Kanchanpur	70	30	40
2	Darchula	60	10	50
3	Baitadi	20	10	10
4	Kathmandu	180	40	140
5	Pokhara	90	20	70
6	Lalitpur	150	80	70

Figure 8: Valid Food Donation Request Calculation

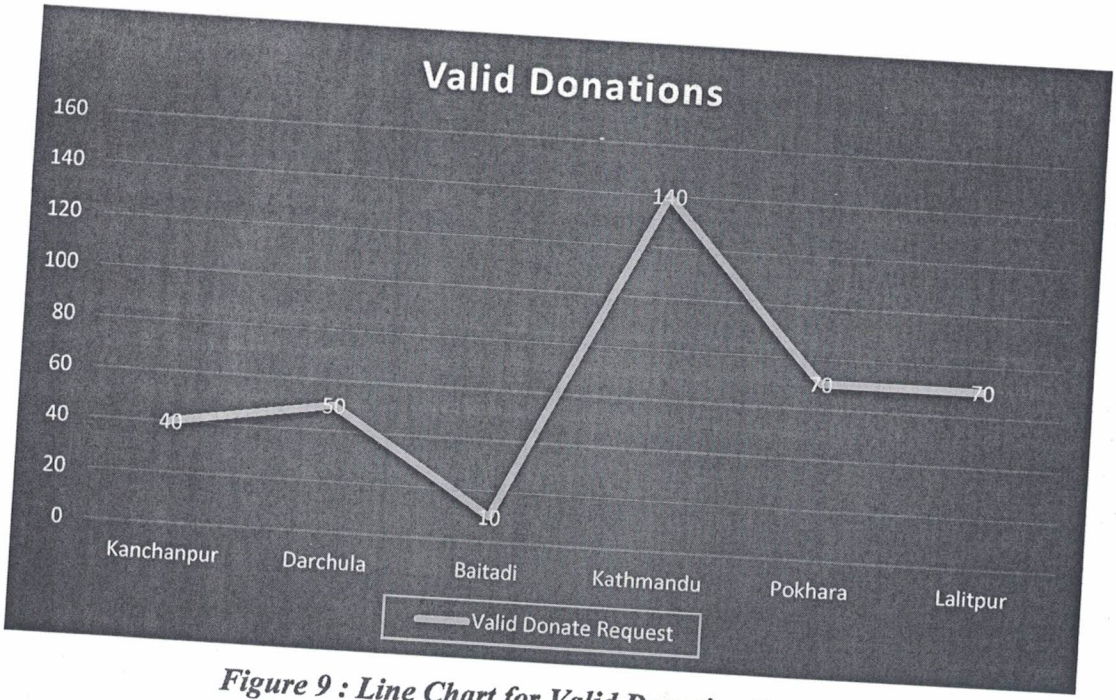

Figure 9 : Line Chart for Valid Donation Request

From above line, it can be clear seen that Kathmandu is the location is where maximum number of valid donation is made. Hence, in location Kathmandu there require maximum number agents than any other location so that food collection process will be done very efficient manner. This line chart also state that Baitadi is the location where minimum donation request was made. Hence, we can do some activities to that location to motivate them to do more donation. Hence line chart or bar chart not only help to manage agent in proper location to collect food efficient manner but also helps to increase the donation request from any particular locations.

CHAPTER 6

CONCLUSION AND FUTURE ENHANCEMENT

6.1 Conclusion

In conclusion, the whole project represents the key issues for hunger and solution for the removing out this issue by collecting food from different sources and distributing it to the needy ones by means of internet.

The primary conclusion of this application is to ensure that the announcement of food available is made in a time as well as the collection and the distribution is made in right place. It targets to narrow down the gap between the collection and the distribution of the food available without any waste. Food waste is unconsumed food. Food waste occurs at all stages, from food production to consumption. Food wastage is the key issues for hunger and climate changes. Hotels, restaurants, homes and catering sectors are the main sources where food wastage occurs. As we all know that there are many restaurants, hotels and homes where food is wasted on a daily basis. Food wastage is the key issues for hunger and climate changes. Hotels, restaurants, homes and catering sectors are the main sources where food wastage is occurred. In simple term, food waste is unconsumed food. Food waste occurs at all stages, from food production to consumption. Food waste has negative environmental and financial consequences. Every day restaurants, hotels, catering sectors around the world throw away tons of food while many people on the same planet are dying from hunger.

Food wastage not only cause the hunger issues but also cause climate changes issues. So in order to reduce the wastage of food, reduce the hunger issues as well as reduce the climate changes, the author has come up with an idea called Online Food Collection and Donation System, where the system will allow to collects the food from different locations including hotels, restaurants, homes and catering sectors etc. and after collecting food from different sectors food will be distributed to peoples who are in need. Online Food Collection and Donation System targets on reducing wastage of food by collecting and feeding hungry people. Online Food Collection and Donation System not only helps to reduce the hunger issues in the society but also helps to reduce the waste of food and keep the balance climate by proper utilization and management of wastage food.

6.2 Limitations and Future Enhancement

The "Online Food Collection and Donation System" is a web based application that has two main purpose collection food from different sources and distributing the food to the need one. However, the author has implemented the system in such way that the food collection and donation part has been developed successfully but food distribution system is not implemented yet in the system.

The different limitations can be illustrated below

1. The food distribution part is not implemented in system.
2. Database notification facilities not available while changes occur in database.

Regarding the limitations, author hope to implement the project in the future for overcoming the above limitations with the following enhancements:

1. The food distribution part will be included in the system.
2. System will be enhanced by adding new module for donors.

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APPENDIX I

SOME IMPORTANT CODE FUNCTIONS

Agent/Admin Login Code:

```
protected void login_Click(object sender, EventArgs e)
{
 if (userName.Text != null || password.Text != null)
 {
 DataRow dr = _login.Login(userName.Text, password.Text);
 if (dr["MSG1"].ToString() == "SUCCESS")
 {

CommonFunction.WriteSession("a_agent_code",dr["agent_code"].ToString());

CommonFunction.WriteSession("a_user_code",dr["agent_user_code"].ToString());

CommonFunction.WriteSession("a_fullName",dr["Name"].ToString());

CommonFunction.WriteSession("a_userName",dr["user_name"].ToString());

CommonFunction.WriteSession("a_gender_code",dr["gender_code"].ToString());

CommonFunction.WriteSession("a_approved_date",dr["approved_date"].ToString());

CommonFunction.SweetAlertSuccessMessageCallbackUrl(this,"Success",dr["MSG"].ToS
tring(), "/AgentPanel/AgentHomePage.aspx");

}
 else if (dr["MSG1"].ToString() == "WARNING")
 {

CommonFunction.SweetAlertErrorMessage(this,"Error",dr["MSG"].ToString());
  }
 else
{

CommonFunction.SweetAlertErrorMessage(this,"Error","Username or password
worng,try again.");
 userName.Focus();
   password.Text = "";
 }

}
else
CommonFunction.SweetAlertErrorMessage(this,"Error", "Please input all fields");
}
```

Database Code:

```
public class DatabaseOperationClass
{
    SqlConnection conn;

    private void Init()
    {
        conn = new SqlConnection(GetConnectionString());
    }

    private void OpenConnection()
    {
        if (conn.State == ConnectionState.Open)
            conn.Close();
        conn.Open();
    }

    private void CloseConnection()
    {
        if (conn.State == ConnectionState.Open)
            this.conn.Close();
    }

    private string GetConnectionString()

    {
          Return
           ConfigurationManager.ConnectionStrings["connectionString"]
          .ConnectionString;
    }

  public DataSet ExecuteDataset(string sql)
   {
       Init();
       var ds = new DataSet();
       var cmd = new SqlCommand(sql, conn);
       cmd.CommandTimeout = 120;
       SqlDataAdapter da;

       try
       {
           OpenConnection();
           da = new SqlDataAdapter(cmd);
           da.Fill(ds);
           da.Dispose();
           CloseConnection();
       }

       catch (Exception ex)
       {
           throw ex;
       }
       finally
       {
           da = null;
           CloseConnection();
       }
       return ds;
   }

}
```

APPENDIX II

SOME RELEVANT SCREENSHOTS

Figure 10: Default Page for admin/agent/donor

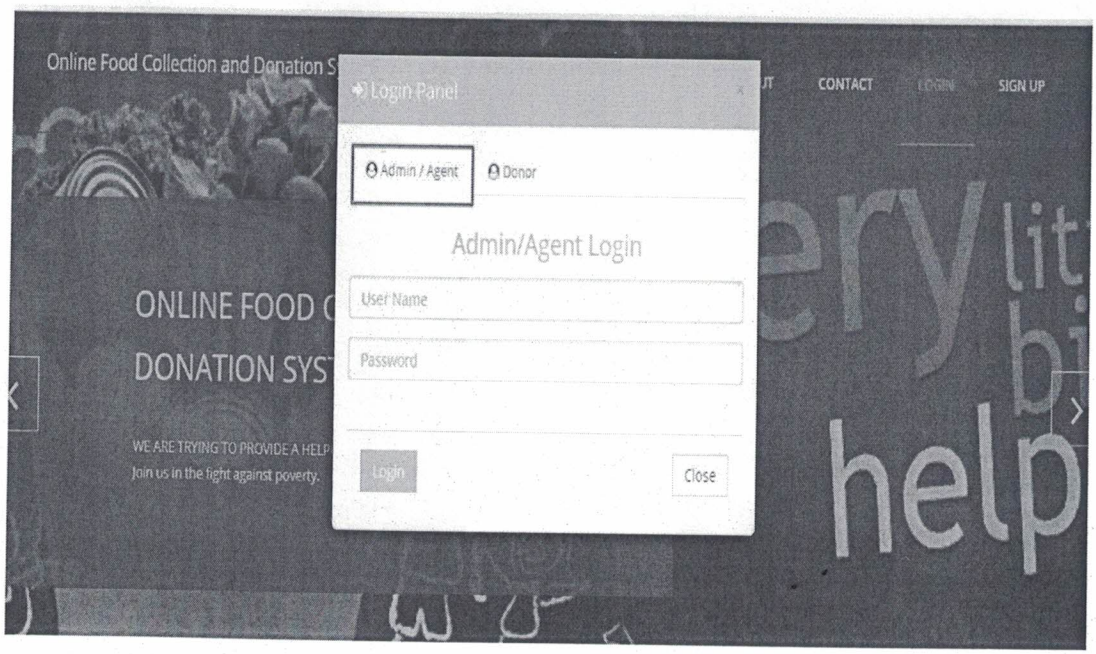

Figure 11: Agent/Admin Login Panel

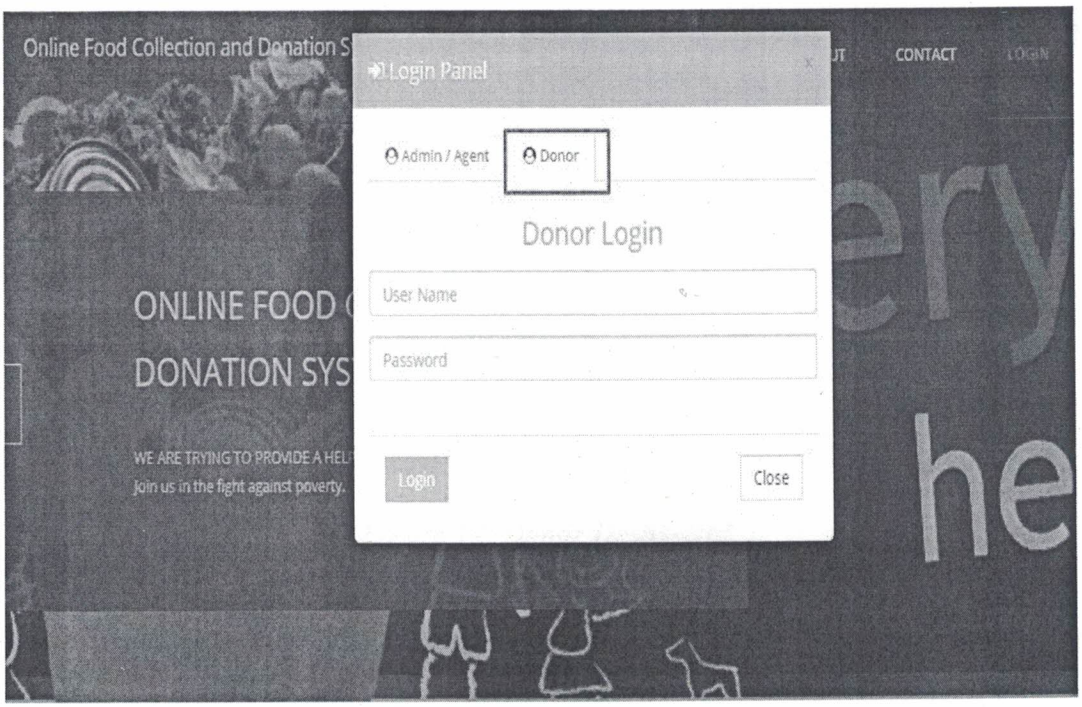

Figure 12: Donor Login

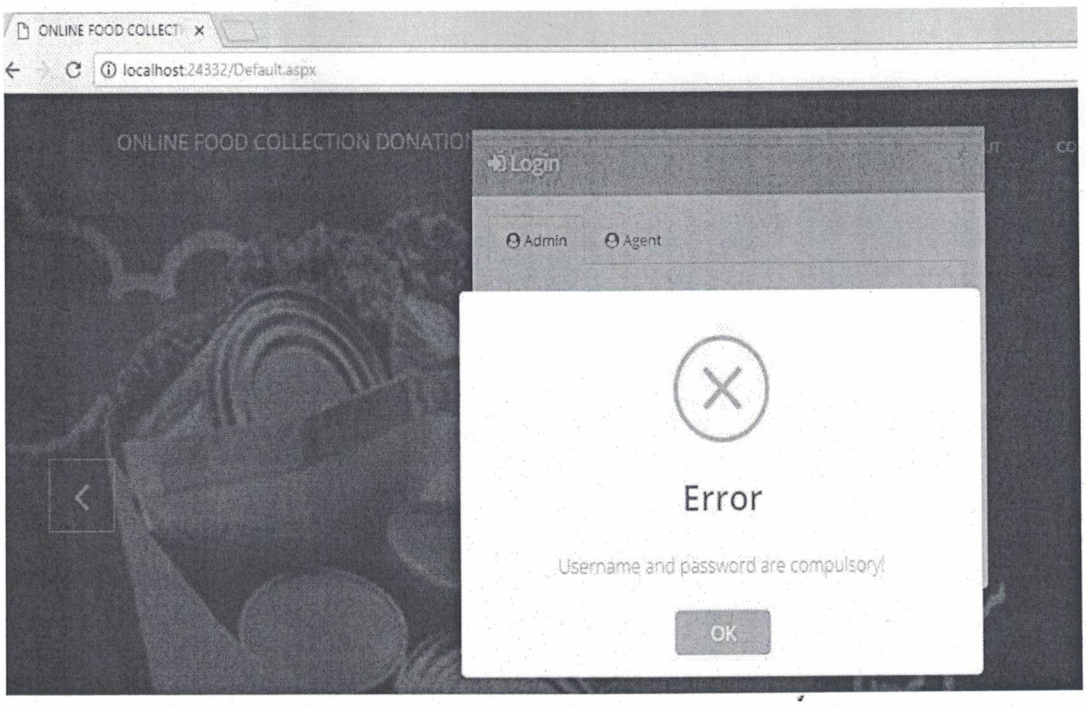

Figure 13: *Login Validation for Agent/Admin*

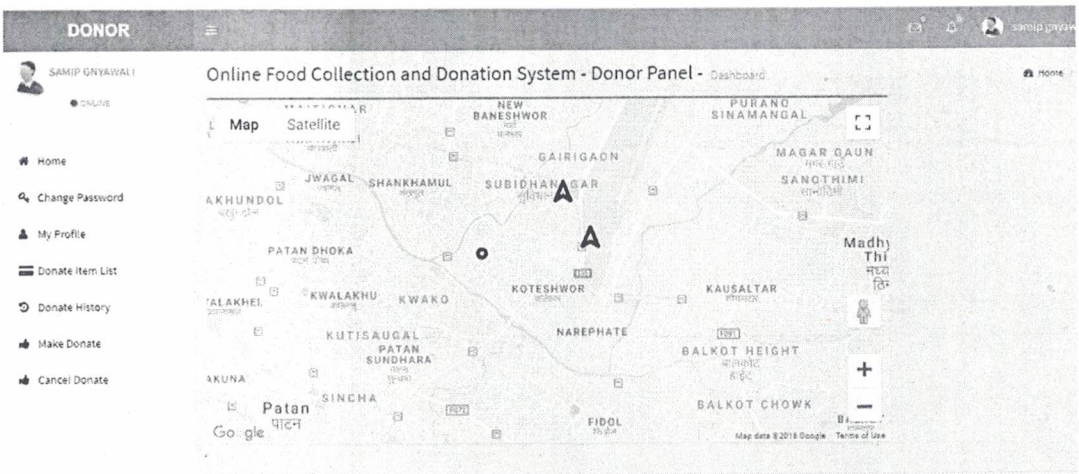

Figure 14: Donor Dashboard

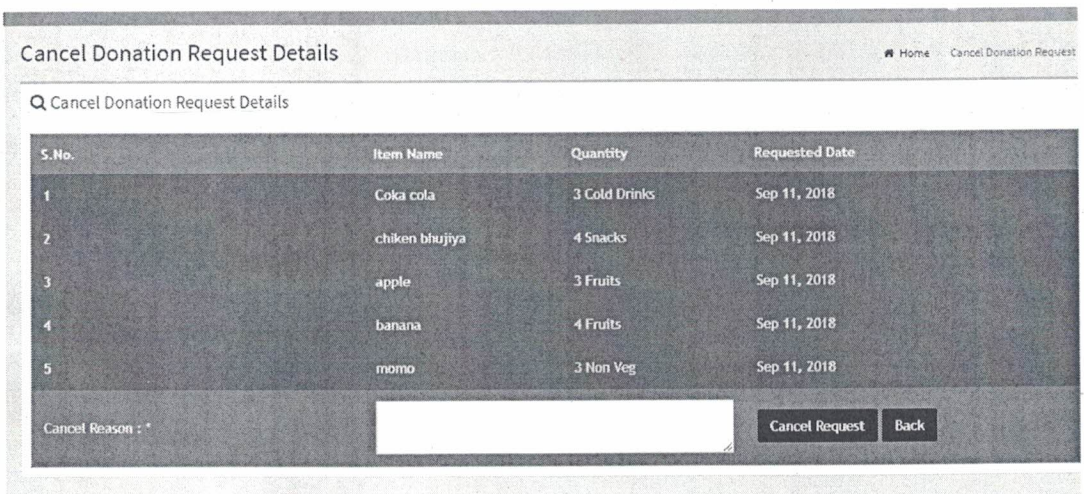

Figure 15: Donor Cancellation Request