Criterion A

Defining the Problem *(251 words)*

The **client** is the owner of a small non-profit organization called "**careshare**" that provides daily free donations to the poor and needy at physical distribution points in different cities. Donors can come to these points, provide donations and specify the type and quantity of the donation items. The donors only pay in cash and the organisation buys these donations and makes them available for the receivers. Similarly, "receivers" can come to these physical points and get these donations[1]. Employees at these distribution point main Paper-based log book to keep track of the inflow and outflow of donations manually. However, the client has found problems with the current system of operations.

Firstly, the system is too unreliable and easily exploitable. This implies that the current system isn't a very robust method of logging donations. The client has noticed that sometimes the paper-based records do not accurately reflect the incoming and outgoing donations owing to the possibility of human error. Secondly, to maintain the log-books, a number of employees have to be hired on high wages, adding to the overhead charges of the organization, whose funding is already really low. Lastly, often due to the lack of consistency and accuracy in the logbooks, items go out of stock and the logbooks do not reflect this which leads to additional problems[2]. Additionally, the client also added that lately donations have been at an all-time low, and subsequently requested, that I come up with a creative way of promoting more donations

The Rationale for the Proposed Solution *(347 words)*

After consultations, I proposed to the client to develop an all-digital "**donations management system"**. The solution will be focused to tackle problems such as inconsistency of data using databases to store accounts and donation records; dynamically update them through MySQL, and introduce additional features to promote donations.

Both donors and receivers will use the same application, but with different account access. Donors would be able to make donations and check what items are out of stock; this would help them decide what type of donation they should make (i.e. donate the items that are out of stock). A donation leader board would promote donations by displaying which donor has the most donations. Receivers would also be able to check what items are in stock and be able to get these items[3].

I chose to solve this problem, using Java to develop the program, in Eclipse IDE. The main reason behind choosing Java to develop the back-end is because it is a language that I was familiar with and also because it is an Object-oriented Programming language (OOP). The OOP style of Java makes it easier to decompose the program down into smaller problems that can be easily solved. This improves the readability and reusability of the code as the code is easier to understand and methods can be reused. Java was used for developing the

[1] Appx 1 - Preliminary Interview with Client Q1
[2] Appx 1 - Preliminary Interview with Client Q2
[3] Appx 1 - Preliminary Interview with Client Q3

backend as it is a very popular (widely used) and portable language which means that it can be executed on all major platforms running the Java Virtual Machine (JVM) which means this application could potentially be ported to other platforms such as mobile devices and personal computers. Moreover, Java has the JDBC API which will allow connecting a MySQL database to the application. The MySQL database will keep track of the inflow and outflow of donations and act as a backend for the accounts system. I will develop the front-end Graphical User Interface (GUI) through JavaSwing. JavaSwing was chosen as it has an extensive library of GUI elements which will be helpful when creating user-friendly and intuitive interfaces.

Success Criteria

Keeping in view the client's requirement[4], the following success criteria was determined[5]:

1. **Design**
    a. The application should have inbuilt validation checks in place for each field and consequently, separate error messages should be generated for each type of validation error.
    b. Donations inflow and outflow must be logged accurately.

2. **Donors**
    a. The program should allow the users to sign into and out of their accounts and create new accounts.
    b. For each donatable item, the donors should be able to see the price per unit and they should be shown the calculated price for the donation that is being made after entering the number of donations.
    c. All donations that the user makes must be logged accurately in the database
    d. The application should display the top donor (user with most donations) (to promote more donations)
    e. The application should inform donors about the availability of each type of item.

3. **Receivers**
    a. Account can only be registered with a unique identification number (CNIC) in a valid format for receivers.
    b. Receivers should be able to login to their account using their CNIC and username
    c. User should be able to check the availability of items currently in stock
    d. Users should be able to print a receipt of the donations that they get

[4] Appx 1 - Preliminary Interview with Client
[5] Appx 1 - Second Interaction.