A Level Computer Science Coursework

FOLSS Uniform Shop Program

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# Analysis

## Description of the Problem

I am going to build a program for my school PTA (FOLSS) to manage pre-loved uniform sales.

FOLSS run a pre-loved uniform shop where they sell items that have been donated by students, parents and boarding Houses. The money raised from the sales goes back into providing treats and other items for the pupils. Each house receives 75% of the sales price of items they donate, and the other 25% goes to FOLSS. At the moment, when stock is donated, each item is manually labelled with the name of the donating House. When an item is sold, this label is detached, and the sales price and House is recorded on a spreadsheet. This process is labour intensive and is also slow during sales because a customer may be purchasing several items which have been donated by several different houses. This can lead to a backlog at the checkouts during busy sales. After the sales, the amounts due to houses have to be calculated.

The program I will create will contain a checkout system to speed up the processing of sales, as this is currently done manually. It will also contain ways for the volunteers and staff at the school to access the totals for how much uniform has been sold and sort this by house. I am also planning to create an online shop where pupils or parents can buy uniform from the shop. They will then be able to either pick it up from the shop or have it delivered to them in school. The program will also include stock management features to help the volunteers to sort through the uniform and know what items they need more of.

To solve this problem I am going to use a database with a web front. Users will input data into the website which will be stored in the database and then be accessed from other parts of the website.

I will start this project by considering the needs of stakeholders to understand exactly what the website needs to be able to do, and also consider existing solutions to similar problems.

## Stakeholders

I have identified three main groups of stakeholders: FOLSS Volunteers, Uniform Shop Customers, and School Staff. I have also split these three groups into smaller sub-sections. All of these users will use the website in different ways, so they all need to be considered. I will interview stakeholders before I start to design my coursework, and also get opinions from them throughout the development process.

### Volunteers

The FOLSS uniform shop is run by volunteers who are parents of pupils at Oundle. They are in the shop for uniform sales and also spend time in the shop outside of sales organising uniform and managing stock. They will use management side of the website while the customers will mostly use the online shop. Within the volunteers section there are also two sub-categories, Committee members and Other volunteers.

#### Committee Members

The FOLSS committee membership form the leadership of FOLSS. There are three members who have different roles. They will need to be able to use all the functions other FOLSS volunteers use, but they will also need to perform other tasks. Some of these include:

* View the total amount raised from each sale, and how it has been split by house
  + This is so that they can distribute the money to different houses and know how effective the sale was. Currently these totals are calculated manually after each sale, so a live view during the sale would be useful to see how it is going. It would also decrease the amount of work that they have to do calculating totals which can take a long time. Reducing this time is important as all three members have full time jobs so are very busy.
* Add volunteers to the system
  + They need to be able to do this as volunteers will have different permissions than other users such as being able to access the checkout system and adding stock to the shop.
* Add, edit and remove items on sale in the shop
  + This is so that if the uniform changes or the price of it changes the shop can adapt to this and edit what is on the website. All of the members have minimal technical experience, so this needs to be done in a way that is easy to use for non-technical people.

I will interview all three of them so that I can get their opinions on the system as they will be the people who use it the most.

#### Other Volunteers

FOLSS has many other volunteers who aren’t part of the committee. They will use the website in the following ways:

* Use it as a checkout system for the shop
  + Having a checkout system will speed up the process of checking out orders as currently it is done on paper or on a spreadsheet so a website will greatly simplify this. Sometimes different people have different ways of writing down sales which can get confusing for people who are trying to sort out the totals later.
* View online orders and mark the progress of the orders. E.g. In progress, finished, ready to be delivered/collected
  + They need to be able to see the orders so that they can fulfil them. Marking the status of them will help to organise what still needs to be done so that this can be co-ordinated with different members.
* Add stock to the system when it is donated to the shop
  + When stock is donated, volunteers need to be able to add it to stock. This is so that they can easily keep track of how many of each item they have, and understand what they are short of. Currently there is no way to accurately know how much stock the shop has, so adding this feature to the website would be useful.

I will interview \_\_\_\_ as a representative of this group to get advice on how to best suit the needs of the volunteers.

### Customers

At FOLSS sales there are many customers who come to buy pre-loved uniform. Customers will use the online shop part of the program, and they will also be indirect users of the checkout system as volunteers will use it to process their orders. This can be split into parents and students, and they might have different requirements for the program.

#### Parents

Parents are the main customers at uniform sales. They come to sales to buy uniform for their children, and also sometimes contact FOLSS to buy uniform outside of the sales. They will use the website in the following ways:

* Use the online shop to place orders outside of sales times
  + Parents can’t always come to the shop to buy uniform, so being able to place orders online would mean that they can still buy the shop’s pre-loved uniform. They can also make sure that the shop has what they need instead of coming to the shop to find they don’t have it.
* Have a way to arrange picking up an order or having it posted to them or delivered to their child’s boarding house
  + Parents need to be able to receive their online orders and there are multiple ways which they need to be able to do this. They can pick it up at the next sale. If they can’t come to the shop then they could also have it posted to them, but if the child needs it urgently then this might not be the best way so they should also be able to have it delivered to their child’s boarding house.
* Store details such as their address in the system to make checkout easier in the future. These details are confidential so will need to be secured securely in the database.
  + This is needed as inputting details every time would be tedious so being able to store them would be much more convenient for parents.
* View orders they have placed and the status of them
  + This is so that parents can understand the progress of their orders and then they are likely to be delivered. This would give parents peace of mind that their orders are being dealt with and haven’t been ignored.

I am going to talk to \_\_\_ who will represent the parents who use the shop so that I can suit the solution for their needs.

#### Students

Students also buy uniform from the shop. They will mostly use the online shop and will have the following needs for it:

* They need to be able to arrange to pick up items in store or have them delivered to their boarding houses
* Use the online shop to place orders
* View orders they have placed and the status of them
* Be able to pay for orders by adding it to their school bill

I will talk to \_\_ to get student’s opinions about the website.

### Staff

Staff at the school will need to be able to use the system to view how much money each house has made. There are two main groups of people who will need to view these totals, Matrons and Housemasters/Housemistresses (Hsms for short).

#### Matrons

Matrons play a larger role in boarding and day house life. They also donate a lot of uniform to the shop as it is passed down from pupils in the boarding house. They will use the website in the following ways:

* View the money raised from sales for their house
  + This is so that they can see how well the uniform they have donated is selling, and also decide with Hsms how the money will be spent on the pupils.
* See what items of uniform the shop is short of
  + If Matrons can see what uniform the shop is short of, they can see if they have any of that kind of uniform so that they can donate it to the shop. Donating items the shop is short of means that they are more likely to get sold so more likely to earn the house money.
* View items that are selling well at the shop
  + If matrons can donate items that are in-demand this means that their house will get more money so be able to provide more for the pupils.

#### Housemasters/Housemistresses (Hsms)

Hsms are the head of a house and are responsible for all the pupils in that house. The money for each house from sales goes into the house bank account which Hsms are responsible for, meaning they decide how that money is spent on the pupils. They need to be able to see how much money their house is owed so that they can ensure that they get the right amount of money sent to them.

## How the problem can be solved by computational methods

This problem is suitable for a computational solution because it requires data to be stored, processed and distributed. This is much easier to do with an online database instead of on paper as it is less prone to mistakes, and can be accessed by many people from multiple locations at the same time. It also reduces the need for volunteers to process the data, as it can be done automatically by the system.

### Thinking Abstractly

I will remove unnecessary details from the program to focus on what users need to be able to see

Ways I can use abstraction to simplify the checkout system:

Ways I can use abstraction to simplify the online shop:

### Thinking Procedurally

### Thinking Logically

### Thinking Concurrently

## Research

### Current System

### Interviews with Stakeholders

I will interview at least one person from all of the groups of stakeholders to identify their needs for the website.

#### FOLSS Committee

Questions I will ask the committee:

* What functions do you want the website to be able to perform?
* What do you want the website to look like?
* How do you currently record the amount of money for each house?
* How would you like the online shop feature to work?
* How are the levels of stock managed?
* What additional functionalities will the committee need compared to other volunteers?
* What types of devices should the website be compatible with?
* What information should be displayed about the items of uniform on the online shop?
* How would you like the checkout system to work?

Questions for the treasurer: Joanne

* How is money taken from customers at the checkout?
* How would you like the transaction at the online shop to work?
* How is the money from each sale split between the houses?

Questions for the chair: Becky

* How do FOLSS use the money that is raised from the sales?

Questions for the secretary: Christina

* How are houses currently made aware of how much money they are owed from uniform sales?

#### FOLSS Volunteer

These are the questions I will ask \_\_\_\_\_

* Can you explain what happens when a new item of uniform comes into the shop?
* How does the checkout system currently work?
* What will volunteers need to be able to do with the system?
* How would you like the website to look?

#### Parent

Questions for parents

* How often do you go to uniform sales?
* How do you find the checkout system?
* Would you find it useful if there was an online shop?
* Do the aesthetics of a website affect your user experience?
* Are there any other features you would like to see?
* Do you find it easy to contact the FOLSS team if you have any questions?

#### Student

Questions for students

* How often do you go to the uniform shop to buy uniform?
* Do you find it easy to find time to go to the shop?
* Would you buy more uniform if you were able to buy it online?
* Do the aesthetics of a website affect your experience of using it?
* What would make it easier for you to buy uniform?

#### Matron

Questions for Matrons

#### Hsms

Questions for Hsms

* How have you spent the money raised from the uniform shop?

### Similar Solutions

* School blazer
* Veeqo – stock management <https://www.veeqo.com/gb/inventory-management-software-system>

A screenshot of a product list

Description automatically generated

A graph with green and purple lines

Description automatically generated

This photo was taken from one of their marketing videos and shows how the website tracks the most profitable items over time. This would be a useful feature to include in my website so that volunteers and matrons can see what items are selling the best.

Inflow inventory – stock management <https://www.inflowinventory.com/>

* Look at barcodes on there

A screenshot of a computer

Description automatically generated

### Conclusions from Research

## Features of my Proposed Solution

## Limitations of my Proposed Solution

* Not include a way to pay on the website

## Hardware and Software Requirements

### Hardware

My solution will not require me or FOLSS to buy any additional hardware as it will be web-based so able to run on any computer or other device. I will use XAMPP as a local webserver during the development stages of the project.

When I have finished the website, it will need to be hosted on a webserver. I am planning on hosting the website on AwardSpace as it is a free hosting service which provides a large amount of storage space and a MySQL database. FOLSS have said that it would be good to host the website using a free service so that they can spend more of their money on providing things for the pupils. While the badwidth available with free web hosting services isn’t as much as paid ones, it should be enough for the shop as it won’t have that much traffic. If it is too much for the hosting website to handle then I can upgrade to a paid service.

### Software

During development I will host the website locally using XAMPP as it provides me with a webserver and a MySQL database. This also means that I will be able to use PhpMyAdmin to edit and view what is stored in the tables in the database. This will make debugging code easier as I can see if pieces of code have worked and inserted/removed items as they should have done.

I will use visual studio code to develop the website as it supports all the programming languages I will use. It also has helpful debugging features such as different parts of code being in different colours. Using VSCode it is easy to back up my work to GitHub so that it isn’t lost if something happens to my computer.

## Success Criteria

### Checkout + stock management system

### Online shop