**Summary of Client + Business**

The client is the CEO of a local “butty shop” called Barbra’s Butty Shop; they sell sandwiches, with 20 different fillings, as well as: baguettes, rolls, fresh cakes, biscuits, hot pies, sausage rolls, crisps, drinks, and loafs of bread (if they order in advance). The organization consists of three employees: Bob; her husband and manager of deliveries, Burt; their baker, Barry; a part-time employee. They have been running for over 11 years. They get 100 orders a day, 80% of which are to local businesses.

**Summary of Problem**

Barbra’s problem relates to the organization of all of the documented information in the shop. Currently, the system consists of a paper-based system, and includes: completed orders, orders on wait, and stock control. The current system is too time consuming to keep organized and “forever in a mess”, these issues derive from some of the employees forgetting to keep it updated, or some of the documents being misplaced. She also has to manage everything manually -for example, she has to generate an order list by hand, after spending time reading the stock list, which is quite inefficient. Lastly, this system makes it hard for her to perform any analysis on the business, to identify which products are trending.

**Interview**

**Who are your employees and what do they do?**

I have 3 employees working for me, Bob, Burt and Barry. Bob is my husband and works in the shop through the week. Burt is our baker and is in the back making all the produce fresh in the kitchen. Barry is our weekend worker who lets us have a couple of days off.

**What are the employees computer skills/competency like?**

Unfortunately Bob’s eyesight is not what it used to be so whatever system you can make for us needs to be suitable for him to see easily. Barry is pretty techno savvy and would be able to cope with a computerised system no problem. Burt the baker has absolutely no interest in computers whatsoever but agrees that the current system is not where it needs to be. I am ok with sending emails and using the basics of the computer at home but would need lots of help and training with anything too fancy.

**How does your current folder system work?**

Currently there are a set of folders that include orders that have been completed, orders that are waiting to be processed and stock control. When Barry, Bob or I complete an order and it is delivered we transfer the orders from the waiting to be processed folder into the orders that have been completed folder. As we bake the fresh produce Burt updates the stock control folder, when an item falls below a threshold it is reordered by me to our local supplier.

**What are the main problems with the current system?**

As it is an entirely paper based system it does not offer any search or analysis facilities and therefore is a severely limiting factor in the operation of the business. I’d love to see where the company is losing money and at what times we make the most. If we could see patterns then we could expand on them and really benefit financially. The current system is also not working in the sense that if one of us forgets to put the orders in the correct folder then the system is in disarray – Bob is a real nightmare with this. He often forgets to update the orders in the folders and can sometimes misplace them altogether which is why we have customers ringing up to ask where their orders are. Entering new stock and sorting the folders out seem to be all I do these days and to be honest I’m blooming sick of it. The folder system is in the little office we have through the back and at the moment it is not getting updated as staff members have to trail through every time when changes need to be noted.

**Will everyone have the same access to the system?**

I’m worried that if we let the other three have too much access then they could end up deleting things so I think if we give Bob and Burt the basic access to data entry and then give me and Barry full access as that way if I mess up, Barry is on hand to help me with any computer problems.

**What is the main purpose of the proposed system?**

The main purpose is to fix the current system so that we can start making more money. We know technology is developing and we need to get on board. I would like the new system to store information on stock and on orders. I would therefore like it to allow me to search quickly for stock that is low and then re-order it directly from our supplier who would now prefer to receive email orders. I would like a way of analysing trends e.g. collecting all sales information from the last month and then identifying what we sold the most of so I can do some special offers for our regulars. I’d like to be able to enter new stock and orders as well as searching for information to be super quick as currently this is incredibly time-consuming.

**Do they need to be able to print?**

As we are ordering online there is no need for the others to print but it would be nice if I can print my trends out and take them home. I would like to have a go at making leaflets and business cards to advertise the shop too so we can build our business clientele.

**Any additional information you would like to record?**

Not at this time.

**How many orders do you process on average every day/week/month?**

We process roughly 100 orders a day. Our most profitable section of the business is the delivery service we provide to local businesses. I would say 80% of our business is from them and the rest are local residents who pop in on their way past and purchase bits and bobs.

**How many different items of stock do you hold?**

We have a menu of 20 different fillings for sandwiches, baguettes and rolls. We also offer fresh cakes and biscuits as well as hot pies and sausage rolls. We hold crisps and drinks and can sell loaves of bread if they are ordered well in advance.

**Analysis of Interview**

Firstly, the interview identifies some specific needs of the system, which are particular to the clients – for example, “Bob’s eyesight is not what it used to be”, as well as a summary of the technical ability of the employees, from this we can infer that the system needs to be simple to use, and should utilise a lot of abstraction.

After this, a details description of how the current operates on a microcosmic level – describing the roles of each of the employees, as well as how some of the data moves between the folders (orders waiting to be processed moved to completed orders). As well as the issues, and frustration, with the current system: no search or analysis functionality, system breaks down if one member forgets to manage their part of the data, or misplacing the folders, the current system is too time consuming, the system is not easily accessible.

Following this, she discusses aspects of the new system, for example, she states how much access she wants each of the employees to have – Bob and Burt should only be allowed to input data, whereas Barbra and Barry should have full access, this could be solved with a login system. She also identifies the primary purpose of the new system – it should make the business more money. Specifically, she wants the new system to store information on stock and orders, as well as fast queries for low stock and other information, and reorder it directly from the supplier via email, as well as this she would like to be able to analyse trends in sales (in terms of cost and sales), lastly she wants to be able to enter new stock and orders quickly, and be able to print.

Then she identifies that she receives about 100 orders a day – 80% of which are from local business, and the different fillings and items she sells.

**Objectives (SMART)**

The following are a list of objectives which should be met by the created system. These have been split into a list to make it more clear and discrete, when it comes to checking them later on during development and testing.

1. Create three different data storages: Completed orders, waiting to be processed, and stock control. Moreover, these data stores should be linked – for example, if one an order is completed, the corresponding order should be removed from waiting to be processed. It should also have a fast query time, and also a manual, as well as automatic, reorder.
2. Create a login system, which gives different users different permissions to these data stores, for example, some users should only be able to add completed orders, whereas other users should have full access to all the data.
3. The system should include a notification mechanic, to remind the users to input the data, at particular times of the day, or significant instances of the system’s processing.
4. When stock falls below a certain threshold, it should be reordered from the stock company via email.
5. Graphs/Analysis should be generated at the end of each week/month, from the sales information, which would show information on the most popular items. The data store should therefore have a field involving special offers, adjusting the price accordingly. These graphs should also be printable.
6. The system should have a simple user interface, and contain high levels of abstraction, to cater to the less technical userbase. As well as this, there should be a lot of automatic processing, to minimize the time the users are required to spend on the system.

**DFD**

(On separate paper)

**Potential Solutions**

Firstly, the main aspect of the system will be the data storage. There are a few different ways the data could be stored, for example, a simple text file could be used to store the data, and it could be read and wrote to during the program processing. However, this does not include a lot of security features, and it is quite easy to accidently delete the file, moreover, a lot of the sophistication which can be found in other solutions would have to be programmed in by the developer. Similar to this would be a csv file, however, this would open up the option of using excel to create some of the functionality of creating the graphs.

Another option would be to use databases. Databases would be beneficial in the sense that they can be used to create relational tables to handle the automatic updating of the system between data stores. Moreover, there are more, as well as more sophisticated, frameworks from which to develop the system from, so the developer would not have to develop a lot of the functionality. The database could be writing in a language like mysql.

A database would provide the security features which is desired by the client (access between the users), however, it is quite sophisticated, therefore the developer would have to program in some abstraction to make it simpler to use for the users. In addition to this, there would have to be additional requirements to develop a server to run and manage the database, although a server would be preferable if there were to be multiple devices accessing the system, rather than a single data point (like what they have now).

Possible solutions to other aspects, for example the login and user access system, can be viewed in the sense of either a desktop based solution, or a mobile device one. The mobile device solution would handle a lot of the user authentication aspect, because, in theory only a particular user should have access to their mobile device, consequently there would be a less of a need for the users to have to remember usernames and passwords, making the system easier to user. In addition to this, using a mobile solution would be easier to implement the notification system, which reminded the users to input the data they need to input, as it could be brought up locally on their device.

On the other hand, there could be a central desktop hub, which would make the system more secure, as it is more central, and can be locked away, as well as this, a central system makes any issues easier to locate.

Relating to this would be the question of making the system web based, or locally accessible. Whilst the web based system would make it so that the user could access the information at home (such as the trends for sales etc), it would also decrease the security of the system, as other malicious users would have a greater access to the system, and it would be more expensive, as the users would have to pay to run the web server. On the other hand a local system would be more secure, and there is no particular reason the users would want to access the information from home, and the user who would want to view the sales trend information could print off a copy and bring it with them.

Lastly, the other option would be to continue with the current system, however, after discussion with the user, this does not appear to be a viable option, due to the user’s outrage with the current system

**Chosen Solution**

For this problem, I have chosen a database programmed in php and mysql as a backend – I will generate the graphs using php and handle the security using mysql. There will be use of a central desktop hub, as well as mobile connections from other parts within the company (depending on the size of the company).

The desktop hub will have a graphical user interface programmed in python, which will be the only part the user will interact with. In addition to this, I will also use python to send the emails to the stocking companies. Whereas, I will program the mobile application interface in Java (the language used for android) – this interface could be used on either their mobile device, or a wall-mounted android tablet.

The reason I have chosen this solution, is because the databases will provide the relational functionality between each of the data stores, and will handle a lot of the security and user access. It is also more secure and robust to store the data this way, compared to a text file system, due to the established and community tested framework in place.

I have decided to use a central desktop hub, because this will be easier for system management, and can be used as a place for full access by the users who have the access – this will be where they can manage their data and print off statistical analysis. Whereas, the mobile devices will only be used to input data. For example, when a new order comes in the user can input the completed order there, rather than having to walk over to the central hub – this will help with the issue of users forgetting update the current system, however, it does come with a potential cost, if the user does not have an android mobile device.

I have chosen python for the graphical solution, because, this is a language which I know and have implemented graphical solutions with before, moreover, this is a somewhat feature heavy solutions with a few different languages, so this will allow me to save time with development, and give me more time with the other parts of the system with which I do not have as much experience with.

I have chosen Java for the android parts of the solution, because that is the established language android devices are programmed in. Although there may be room for C# or C++. Laslty, I have chosen php as the scripting language for the database, because it is a server-side language which I have a bit of experience working with databases in.