# A2 UNIT 5

## 2. Investigation

Ryan Beattie
Candidate Number: 8002
Centre Number: 71741

# Planned Fact-Finding Methods

## 1. Interview

My first planned fact-finding method is a structured interview with the director of Lee Opticians: Michael Gilsenan. This would provide me with an insight into the business operations throughout Lee Opticians' several branches, allowing me to gain a proper understanding of what is required by the system in terms of inputs, processes, and outputs. Through using a structured interview, I can plan the questions that will be asked, shortening the time taken to carry out the interview and improving the effectiveness of the results acquired. However, using a structured interview prevents follow-up questions from being asked, as can be done in unstructured interviews. This can be limiting in terms of the information acquired from the interview; therefore, I must ensure the questions asked are of sufficient detail to receive detailed answers.

## 2. Survey

My second planned fact-finding method is a survey I have created, of which I have requested to send to all members of staff in each of Lee Opticians' several branches. This will provide me with a greater understanding of what needs to be changed from their current system and what the members of staff in each of area of the business require from their new system. Through using a survey, I will be able to receive responses from a large number of staff in a relatively short period of time. This will provide me with a large amount of data for analysis and having more data sets leads to a much more accurate analysis. However, as the number of questions in a survey increases, the completion rate often decreases; therefore, the number of questions presented must be kept to a minimum, and the questions must be kept short and concise.

## 3. Document Sampling

My third planned fact-finding method is to sample documents from Lee Opticians. This will help me to understand what data is required by their new system in terms of inputs and outputs, how this data flows through their organisation and the volume of data, allowing me to gain an insight into the storage requirements for each entity in the new system. Furthermore, document sampling is useful for identifying inefficient data flows, which will enable me to make improvements in their new system to eradicate these inefficiencies. However, there may be other important data that is not included in these documents; therefore, I must ensure I am aware of any other data required by the system through my other fact-finding methods.

## 4. Observation

My fourth planned fact-finding method is to observe the members of staff in one of Lee Opticians' several branches as they carry out their everyday tasks using their current system. This will enable me to view the processes each member of staff carries out and the data they use or generate as they carry out these tasks and will ensure their new system is developed with all members of staff in mind, improving the overall effectiveness of the system. This will also help me to identify any inefficiencies in their current system, ensuring they are resolved with their

new system. However, there may be days where the current system in Lee Opticians does not perform as normal, which a single observation would not consider; therefore, several observations may be required in order to gain a full understanding of what is required by the new system.

# Method 1 - Interview

## Interview with Michael Gilsenan FBDO (Director)

### General Questions

*What are the limitations of your current system?*

The current system we have in place in each of our branches is outdated. Our current paper-based system results in a lack of storage space as paper documents can take up a lot of space and the quantity of these documents will continue to increase every day. Another limitation is the security risk our current system proposes. A lot of the details contained in our system are confidential, for example: our customers' personal details. I am always anxious that our documents could be stolen or used maliciously by either a member of staff or the public. It is our responsibility to protect these details, therefore, I feel it is important that this issue is resolved with the new system. Our current system also requires paper, printers, photocopiers, stationery, and other office supplies, which is a large cost to the business.

*Would you like this system to be implemented throughout all your branches?*

I would like this system to be used throughout all our branches at some stage. However, I would like to install it in our Camlough branch first and see how it performs compared to our current system and ensure there are no errors before implementing it in our other branches. I have chosen to implement the system in Camlough first due to its smaller number of customers compared to our other branches; therefore, less people would be affected if the system were to cause any issues.

*What are the main features you would like your new system to have?*

One of the main features I would like the new system to include is the ability to search for customers to view their details. Our current system is very slow when it comes to finding details of our customers as we currently have many customers on record. Another feature I would like included is to have user access levels for our different members of staff. As previously mentioned, our current system has security risks, so I feel it is important to ensure that all members of staff are limited to only view data that they are permitted to by management.

*What outputs are produced by the current system you have in place?*

There are several documents that are produced from our current system. We have templates for staff payslips and prescriptions for customers, which are filled in when required. We also store invoices from our suppliers for our products.

*How is data input into your current system?*

We use forms to capture data about our customers and staff. These forms are then stored in our filing cabinets alphabetically to keep our system organised. Appointments are made via phone or email which can be found on our website and are then written down into a book which is managed by our receptionists. Prescriptions are written up by our opticians and stored with the customer forms.

*How is data changed in your current system?*

We must ensure all of the data that we store about customers and staff is kept up to date and is accurate in order to comply with the new Data Protection Act; therefore, it is important we are able to change data when required. In order to do this, we provide the customer or member of staff with a new form; where they can write their updated details. We then replace and archive the existing form. Appointments are changed by simply writing in the new appointment in the book and crossing out the old one. Cancelled appointments are also crossed out.

*How is data removed from your current system?*

All data that is no longer required by us is archived. Files that are no longer required to be archived are then destroyed. This is a lengthy process and can take up a lot of storage space as previously mentioned at the start of the interview.

*Have you any data recovery methods in place in the case of your data being lost, stolen or damaged?*

No, as irresponsible as it sounds, we do not have any recovery methods in place. Backing up data is very difficult with our current paper-based system; therefore, I feel the change to a digitised system is necessary for our business in order to protect the data of our customers and staff.

*What security methods do you have in place to protect sensitive customer data?*

Customer data is stored in filing cabinets which are locked when not in use. Staff must be provided with a key to access these cabinets. I am aware that this method may not be 100% secure in keeping our customer data safeguarded from those who do not have permission to view it, however, we are quite limited with our current system. I believe some form of a login screen should be implemented into the new system, where only members of staff with passwords and the correct level of access can view sensitive data.

## Staff

*How many members of staff does Lee Opticians currently employ?*

Throughout all our three branches, we employ 15 members of staff. Each branch has one manager. There are 4 members of staff in our Camlough branch.

What data do you store about your members of staff?

We store details about our members of staff such as their surname, forename, address, date of birth, contact details and their banking information and national insurance number for their pay. We also archive copies of their payslips.

What members of staff would you like to have full access to your system?

I only want managers to be able to access private information such as our staff members' personal details. Optometrists should be able to access prescriptions and customer details. Receptionists should be able to access customer details, orders, and products.

# Interview with Catherine O'Connor (Head Receptionist at Camlough)

## Customers

*What data do you store about your customers?*

We require details from our customers such as their surname, forename, address, date of birth and contact details. We also store customer prescriptions from their appointments with us. Customers can request to have their details updated or deleted at any given time. Records are then archived for a select period and then destroyed.

*How many customers does Lee Opticians offer their services to?*

The branch here in Camlough is much smaller than our other two branches in Warrenpoint and Crossmaglen. I would estimate that we currently store details about 150-200 customers in our local area. Customer records can therefore take up a lot of space in our filing cabinets, which we are constantly having to purchase more of to keep up with new customers. This has become quite a significant expense and taken up a considerable amount of space in our branch.

## Appointments

*How are appointments made and added to your system?*

Appointments can be made in-store, over the phone or via email. The appointment details such as the date of the appointment, the time, the customer's name and the optometrist the appointment is made with, are then written into the book and onto a form by myself and put into the filing cabinet for future reference.

*How are appointments changed in your current system?*

If a customer appointment must be changed, the previous form filled out for the appointment is destroyed and a new one is created with the updated details. It is quite a simple and straightforward process. The old appointment is crossed out in the book and the new one is written down.

*How are appointments cancelled in your current system?*

If an appointment is cancelled, the appointment is crossed out in the book and removed from the filing cabinet to be destroyed.

## Products and Suppliers

*What products do you offer to customers?*

We sell frames and contact lenses. We offer frames for men, women, kids and teenagers and designer frames from popular brands such as: Tom Ford, Ray Ban, Polo Ralph Lauren and Hugo Boss. Our wide range of contact lenses includes soft daily, fortnightly, and monthly lenses, RGP lenses, toric lenses, progressive lenses, coloured lenses and custom-made lenses.

*What data do you store about your products?*

For each of our products we record the name of the product, a product description, the name of the supplier along with its price. We store invoices from each of our suppliers in a filing cabinet, organised alphabetically.

*What data do you store about your suppliers?*

For each of our suppliers, we store their name, address, and their contact details. This is useful if an order needs to be changed or cancelled, or if an order needs to be returned for a refund. It saves a lot of time having these details at hand rather than having to search for them online each time they are required.

## Orders

*What is the process for creating orders with your suppliers?*

To make an order, I require a few basic details about the product such as the product name, and the quantity of the product to be ordered. Invoices are then sent to my email and printed off to be stored in a filing cabinet. When the order is received, the products received are checked against the invoice to ensure everything ordered is there. If there are any issues with the order, I find the details of the supplier and use their contact details to resolve said issues.

# Interview with Jennifer Meehan (Optometrist at Camlough)

## Prescriptions

*What is the process for writing prescriptions for customers?*

Following an eye test with a customer, relevant details are written onto a template we use for our prescriptions. We write the customer's name, the date of the prescription, what is being prescribed, and we then sign off the bottom of the prescription. A copy of the prescription is handed to the customer, while we keep a copy for our own records in a filing cabinet with the customer file.

## Interview Analysis

Following my interview with Michael, it was made clear that although their current paper-based system works for their staff, it contains several flaws that would greatly improve their business efficiency if resolved.

Their current system displays an array of maintainability and organisational issues, such as adding new customers to their files, finding customer data, and removing customer data from their current files. Although Lee Opticians' branch in Camlough is small with fewer customers than their other branches, a digitised system will resolve this issue and make their business operations much smoother and more efficient. Users could search for specific customer records using their name or primary key, and

A significant flaw highlighted in the interview with Michael was the security, or lack thereof, in their current system. Storing sensitive customer data in filing cabinets, that can be easily forced open, is not secure, therefore stronger security methods must be implemented into the new system. I have decided to create a login system for the new system, where each member of staff will have a StaffID and a password they can use to access the system. The StaffID and password must match, or the user will be prompted with an error and will not be granted access to the system. I have also decided to use access levels on the login system, where users will be granted an access level ranging from 1 to 3, with 1 being full access to the system. Each access level will determine the options the system provides when they log in successfully. This will prevent unauthorised access to sensitive data, and malicious use of the data from members of staff.

Another issue that presented itself throughout the interview is the amount of space, and paper required to accommodate the number of records Lee Opticians has on their customers, their products, their suppliers, their prescriptions, their orders, and appointments. Files such as invoices and prescriptions are stored, alongside forms for customers and appointments, which each have their own filing cabinet. A digitised system would reduce the amount of space required to manage their data, storing all these forms, invoices, and prescriptions on local hard drives, which can be easily accessed at any time. I will implement a function into their new system, where the user can input an ID number and print an invoice or prescription with the corresponding ID. This will also further reduce the amount of time spent searching for these documents, improving the efficiency of the overall system.

A minor flaw I uncovered was the process to delete records or cancel appointments. In their current system, deleting records or cancelling appointments is done by archiving and destroying the old record and in the case of changing an appointment, writing out a new form. This wastes a lot of paper, which can be a significant cost to the business, depending on the amount of customers, and appointments being changed or cancelled. Storing these files digitally eliminates the requirement for paper, consequently saving the business money. Appointments could be cancelled or updated using a digital system without the need to create a new record, saving storage space.

Finally, another issue highlighted by Michael was the lack of backup procedures for the event of an emergency. It is important that I can implement a backup procedure into the new system, to ensure data can be recovered. This would save the business a lot of time and money regathering information if these backup procedures were not in place.

In conclusion, the interviews carried out with some of the stakeholders of Lee Opticians provided me with a powerful insight into the requirements of the new system for each stakeholder. It highlighted

some of the key issues with the current system, such as storage space, security, backup procedures, and the organisation of the system. These issues can be used to create a list of individual requirements, which can then be used to create the system design.

# Method 2 - Online Survey

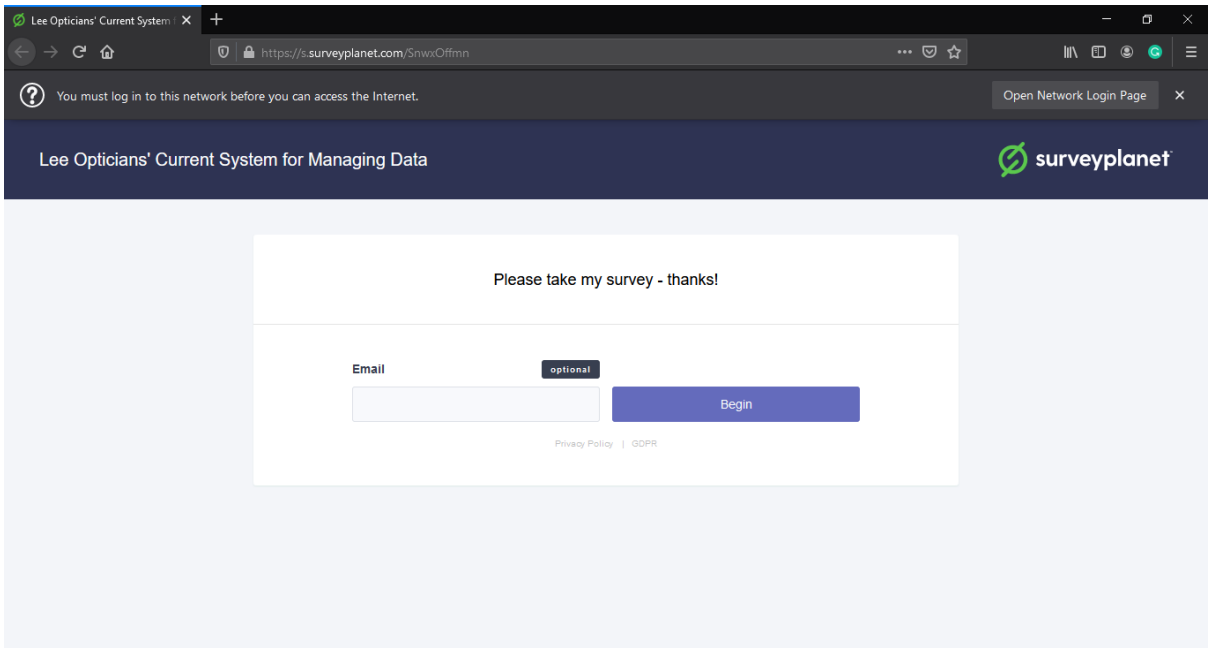
I created a survey online to send to each of the staff members at Lee Opticians via email. Questions are multiple choice to ensure the survey does not take up too much of their time as this can have an impact on the completion rate of the survey. There is an optional question at the end of the survey where staff members can suggest what they would change about their current system.

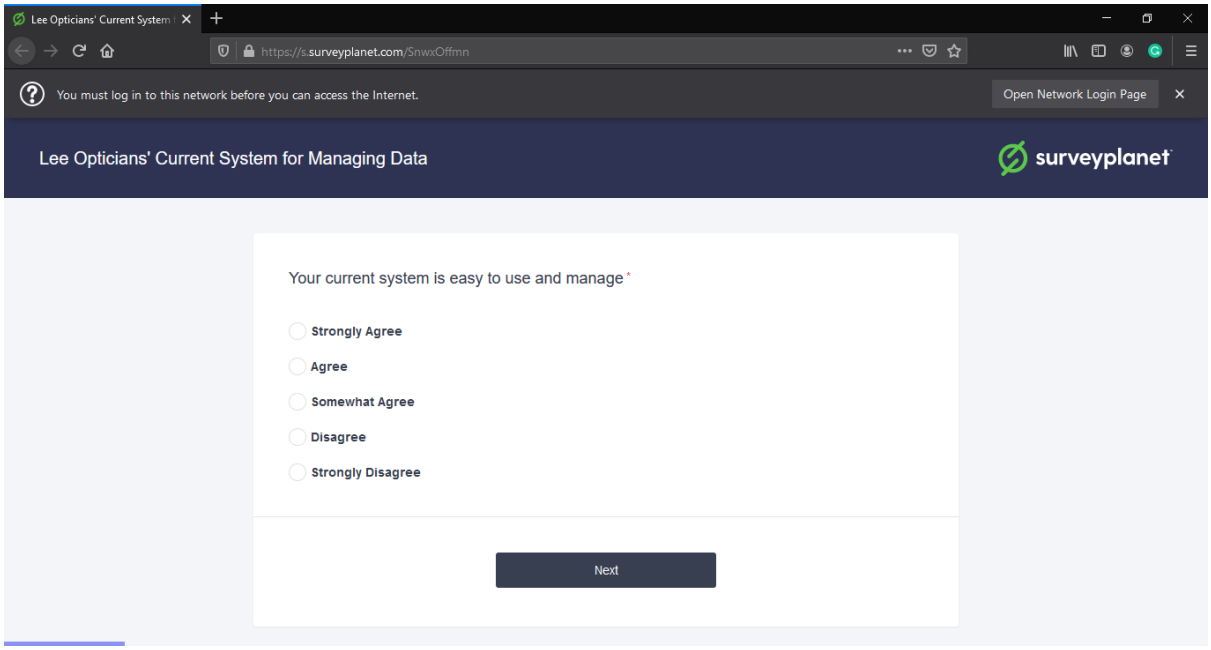
The survey can be found here. Staff members are greeted with an entry to enter their email address, allowing follow up questions to be asked if required. However, this is optional in order to offer members of staff anonymity if they feel uncomfortable sharing their answers.

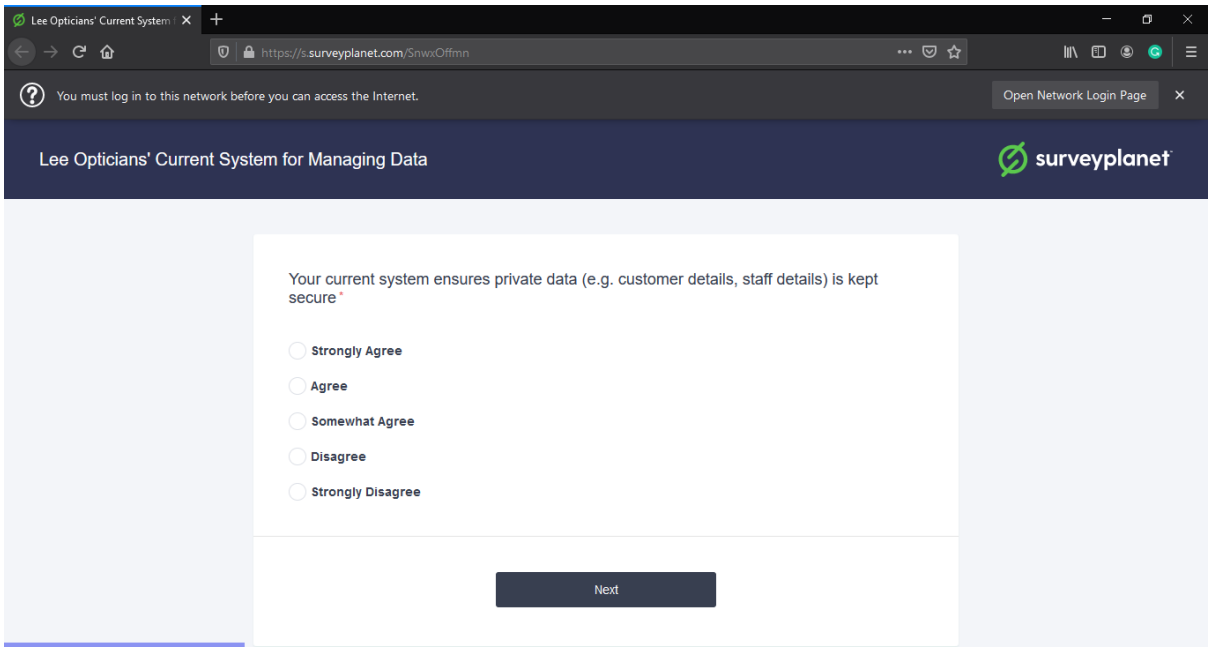
The results of the survey will give me an insight into what the staff members of Lee Opticians would like to be changed about their current system the most.

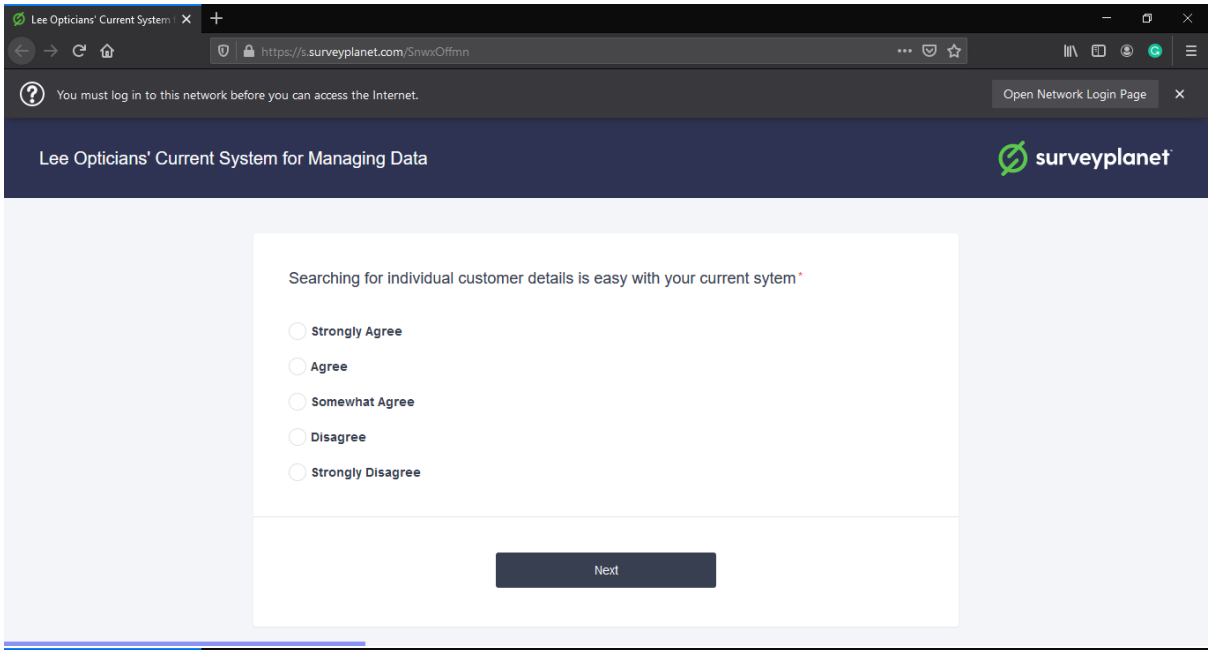
## Survey Questions

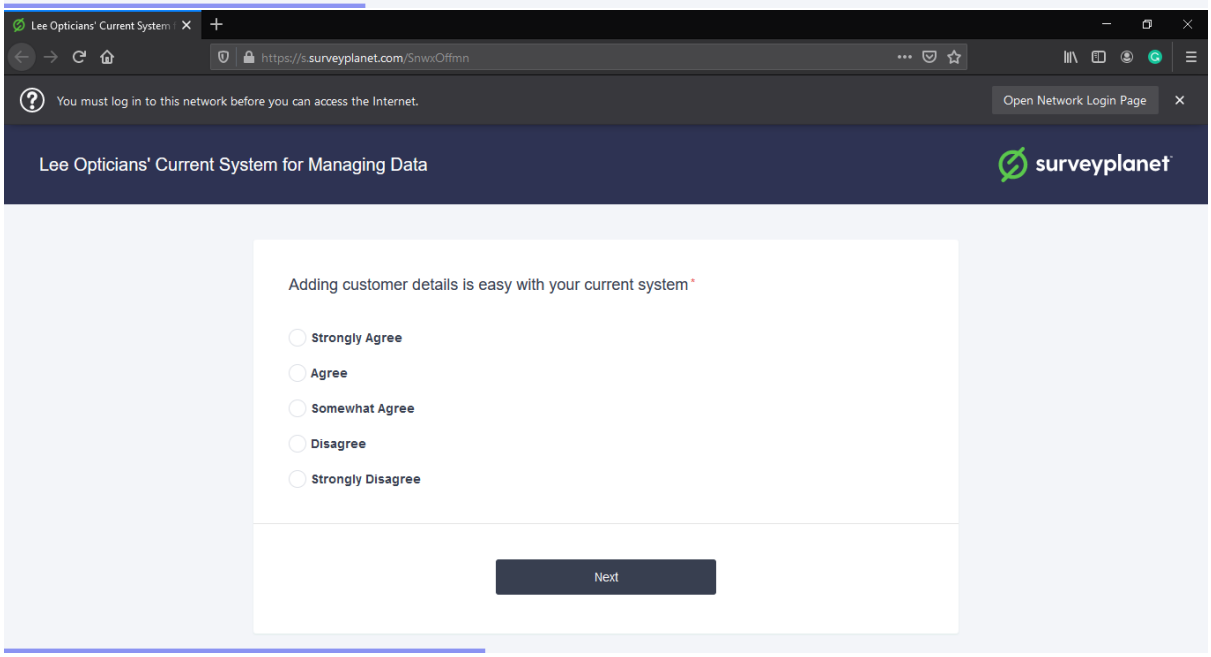
Below are images of each of the questions included in the survey. The survey consists of statements regarding their current system to which staff members can select whether they agree strongly agree, somewhat agree, disagree, or strongly disagree.

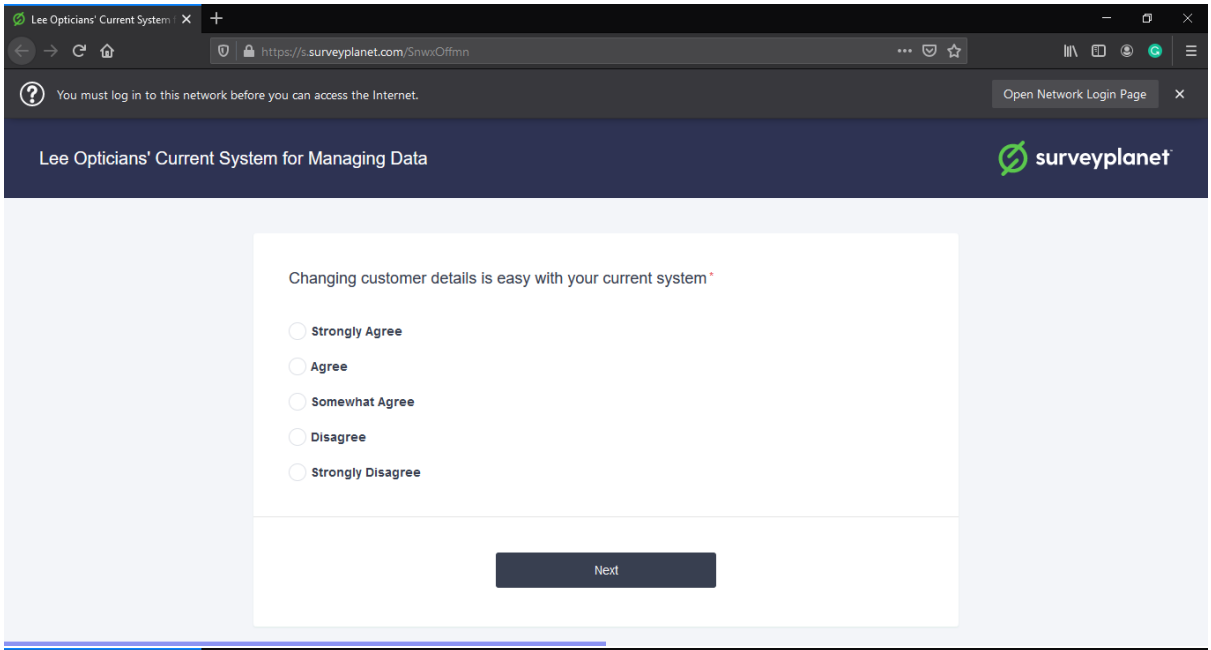


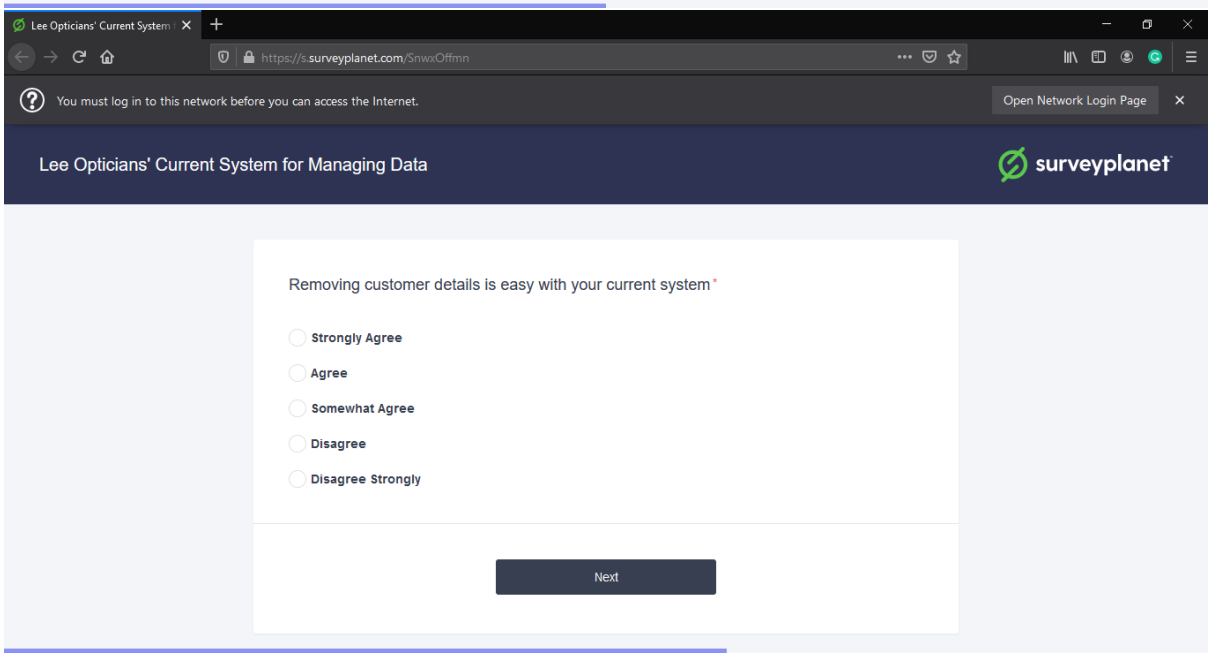

Lee Opticians' Current System
https://s.surveyplanet.com/SnwxOffmn
You must log in to this network before you can access the Internet.
Open Network Login Page
Lee Opticians' Current System for Managing Data
surveyplanet
Your current system is easy to use and manage *
Strongly Agree
Agree
Somewhat Agree
Disagree
Strongly Disagree
Next

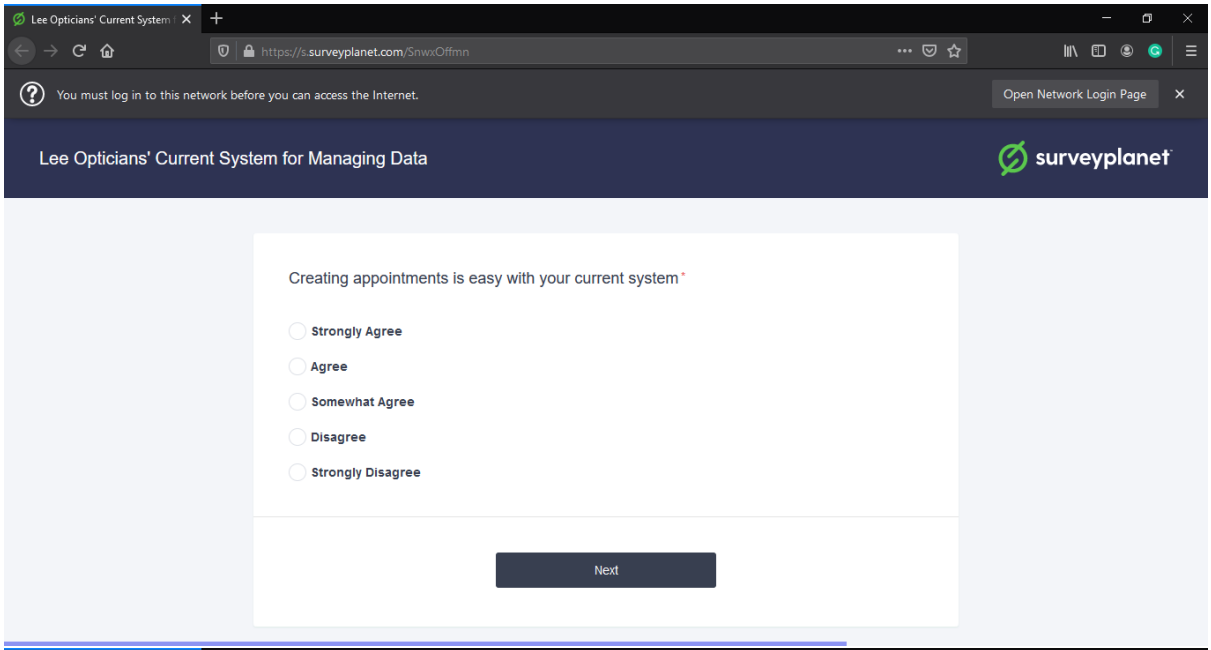

Lee Opticians' Current System
https://s.surveyplanet.com/SnwxOffmn
You must log in to this network before you can access the Internet.
Open Network Login Page
Lee Opticians' Current System for Managing Data
surveyplanet
Your current system ensures private data (e.g. customer details, staff details) is kept secure *
Strongly Agree
Agree
Somewhat Agree
Disagree
Strongly Disagree
Next

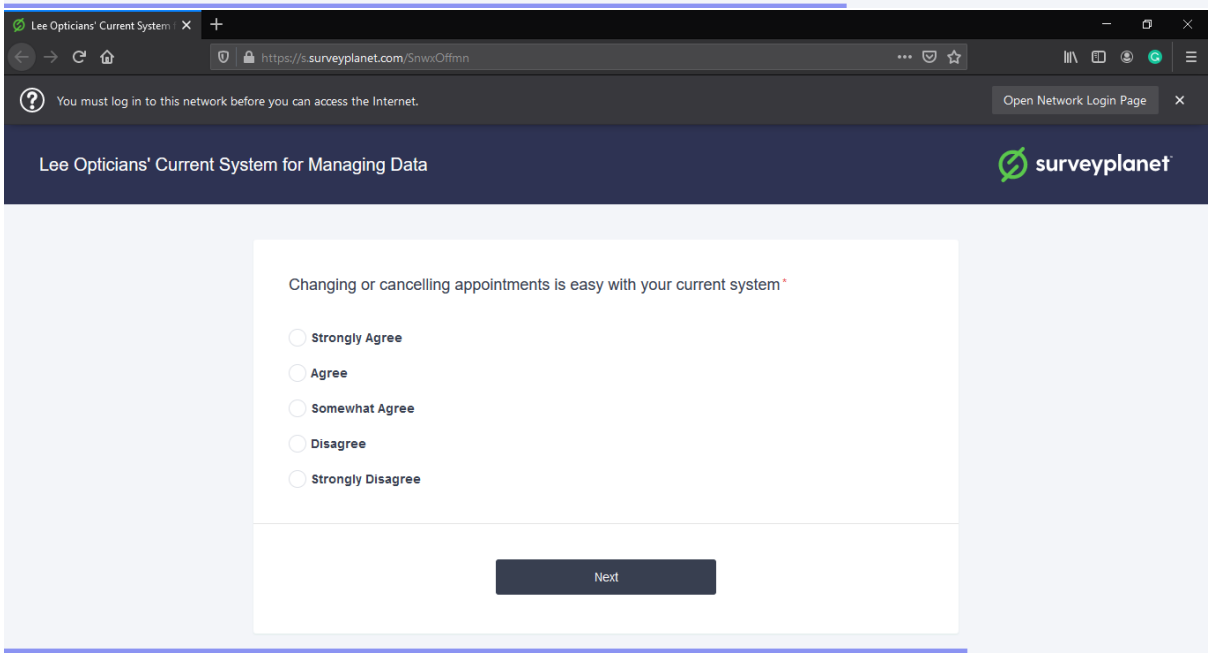

Lee Opticians' Current System
https://s.surveyplanet.com/SnwxOffmn
You must log in to this network before you can access the Internet.
Open Network Login Page
Lee Opticians' Current System for Managing Data
surveyplanet
Searching for individual customer details is easy with your current sytem*
Strongly Agree
Agree
Somewhat Agree
Disagree
Strongly Disagree
Next

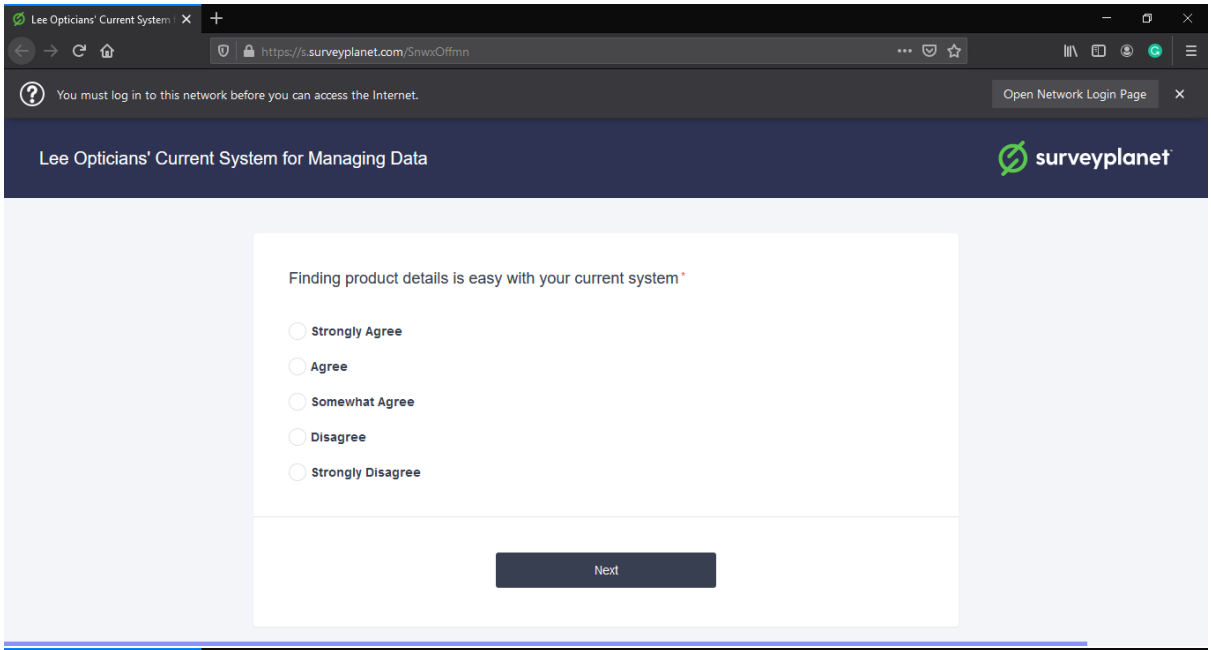

Lee Opticians' Current System
https://s.surveyplanet.com/SnwxOffmn
You must log in to this network before you can access the Internet.
Open Network Login Page
Lee Opticians' Current System for Managing Data
surveyplanet
Adding customer details is easy with your current system*
Strongly Agree
Agree
Somewhat Agree
Disagree
Strongly Disagree
Next

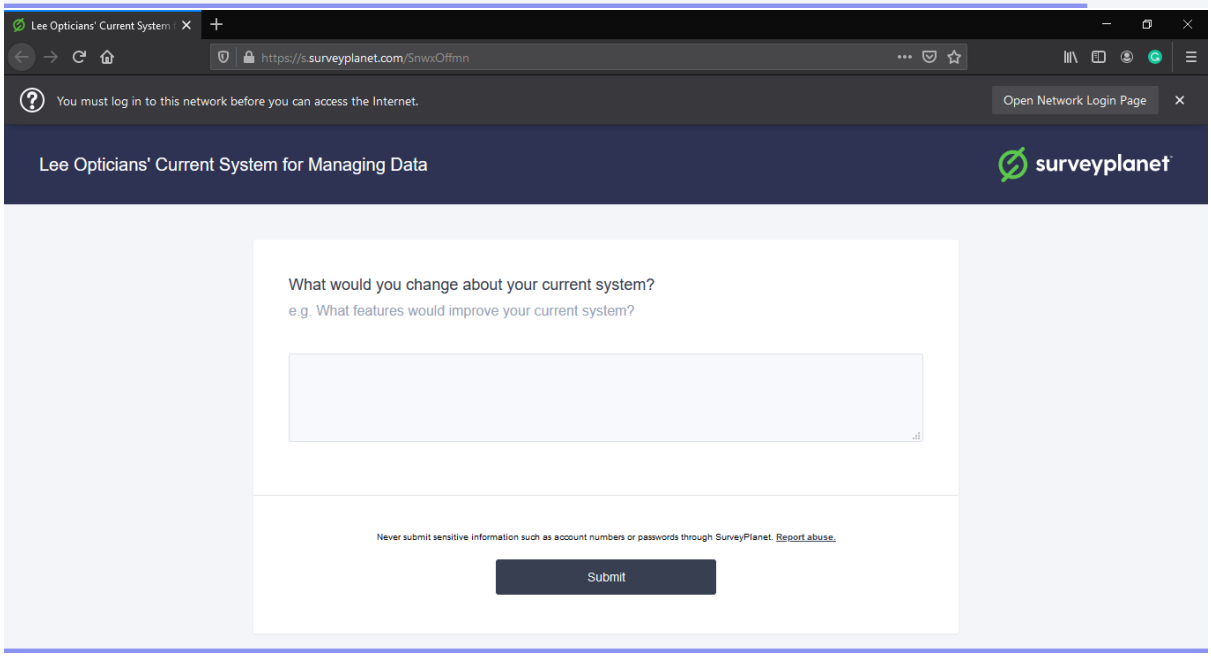

Lee Opticians' Current System
https://s.surveyplanet.com/SnwxOffmn
You must log in to this network before you can access the Internet.
Open Network Login Page
Lee Opticians' Current System for Managing Data
surveyplanet
Changing customer details is easy with your current system *
Strongly Agree
Agree
Somewhat Agree
Disagree
Strongly Disagree
Next


Lee Opticians' Current System
https://s.surveyplanet.com/SnwxOffmn
You must log in to this network before you can access the Internet.
Open Network Login Page
Lee Opticians' Current System for Managing Data
surveyplanet
Removing customer details is easy with your current system *
Strongly Agree
Agree
Somewhat Agree
Disagree
Disagree Strongly
Next


Lee Opticians' Current System
https://s.surveyplanet.com/SnwxOffmn
You must log in to this network before you can access the Internet.
Open Network Login Page
Lee Opticians' Current System for Managing Data
surveyplanet
Creating appointments is easy with your current system *
Strongly Agree
Agree
Somewhat Agree
Disagree
Strongly Disagree
Next

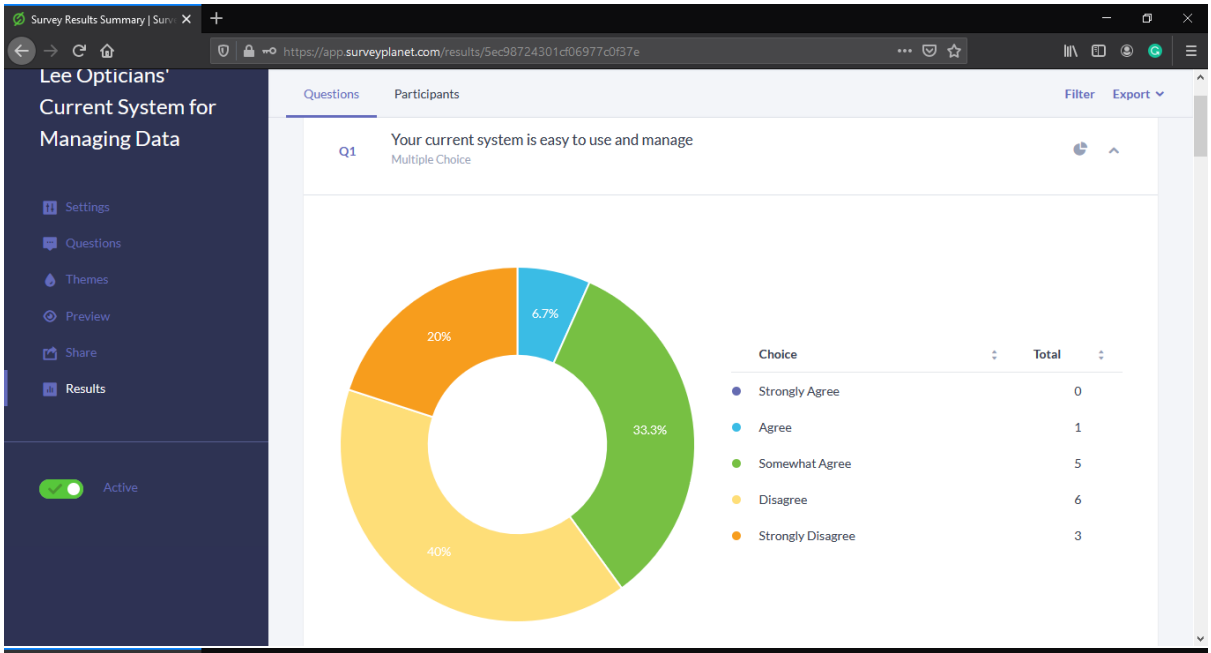

Lee Opticians' Current System
https://s.surveyplanet.com/SnwxOffmn
You must log in to this network before you can access the Internet.
Open Network Login Page
Lee Opticians' Current System for Managing Data
surveyplanet
Changing or cancelling appointments is easy with your current system *
Strongly Agree
Agree
Somewhat Agree
Disagree
Strongly Disagree
Next

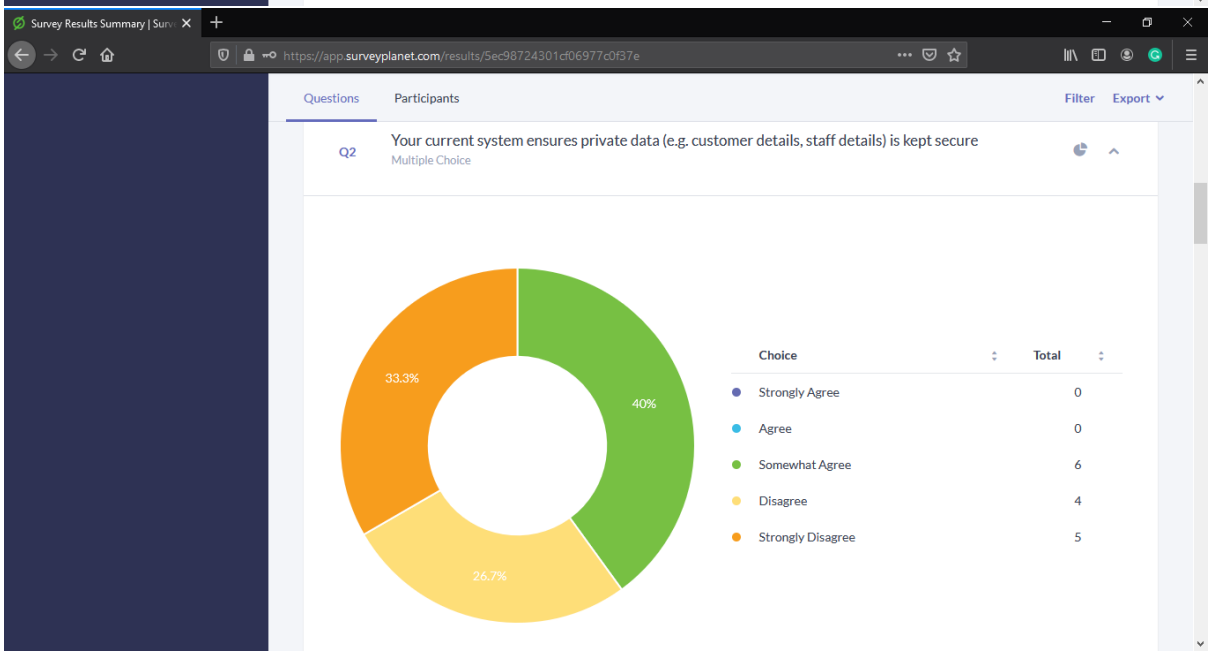

Lee Opticians' Current System
https://s.surveyplanet.com/SnwxOffmn
You must log in to this network before you can access the Internet.
Open Network Login Page
Lee Opticians' Current System for Managing Data
surveyplanet
Finding product details is easy with your current system *
Strongly Agree
Agree
Somewhat Agree
Disagree
Strongly Disagree
Next

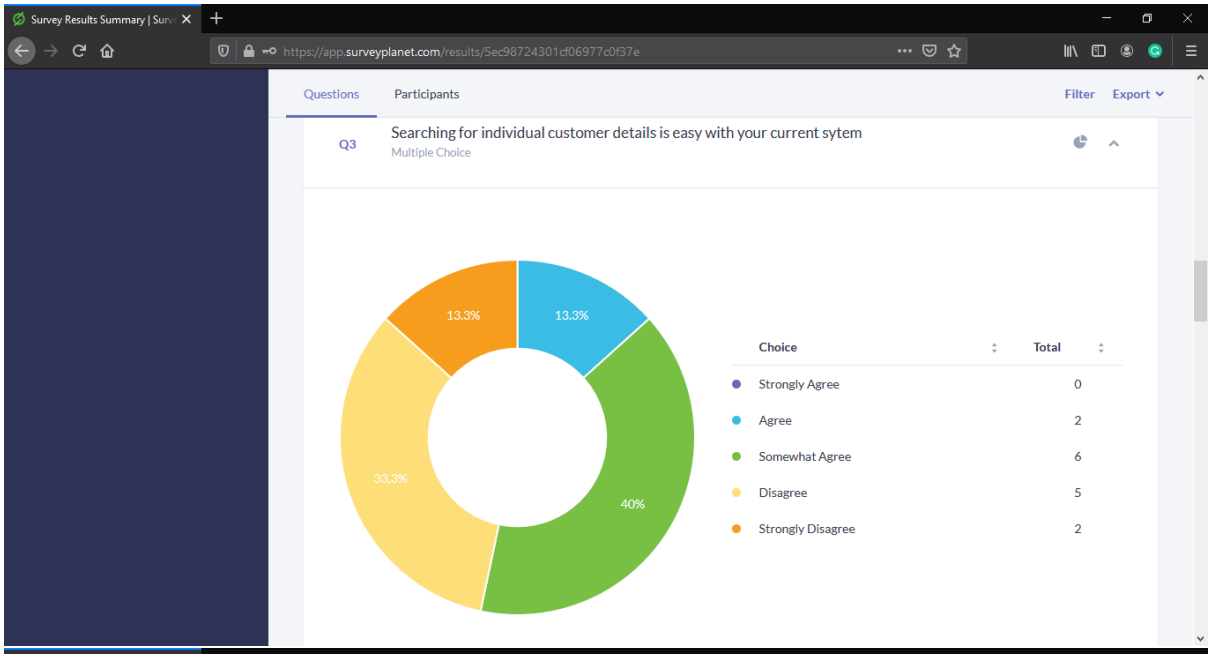

Lee Opticians' Current System
https://s.surveyplanet.com/SnwxOffmn
You must log in to this network before you can access the Internet.
Open Network Login Page
Lee Opticians' Current System for Managing Data
surveyplanet
What would you change about your current system?
e.g. What features would improve your current system?
Never submit sensitive information such as account numbers or passwords through SurveyPlanet. Report abuse.
Submit

## Survey Results

The completion rate of the survey sent to the employees of Lee Opticians proved to be successful, with 15 respondents. 10 out of the 15 respondents provided their email address, allowing for follow-up questions to their responses in the event more information is required.

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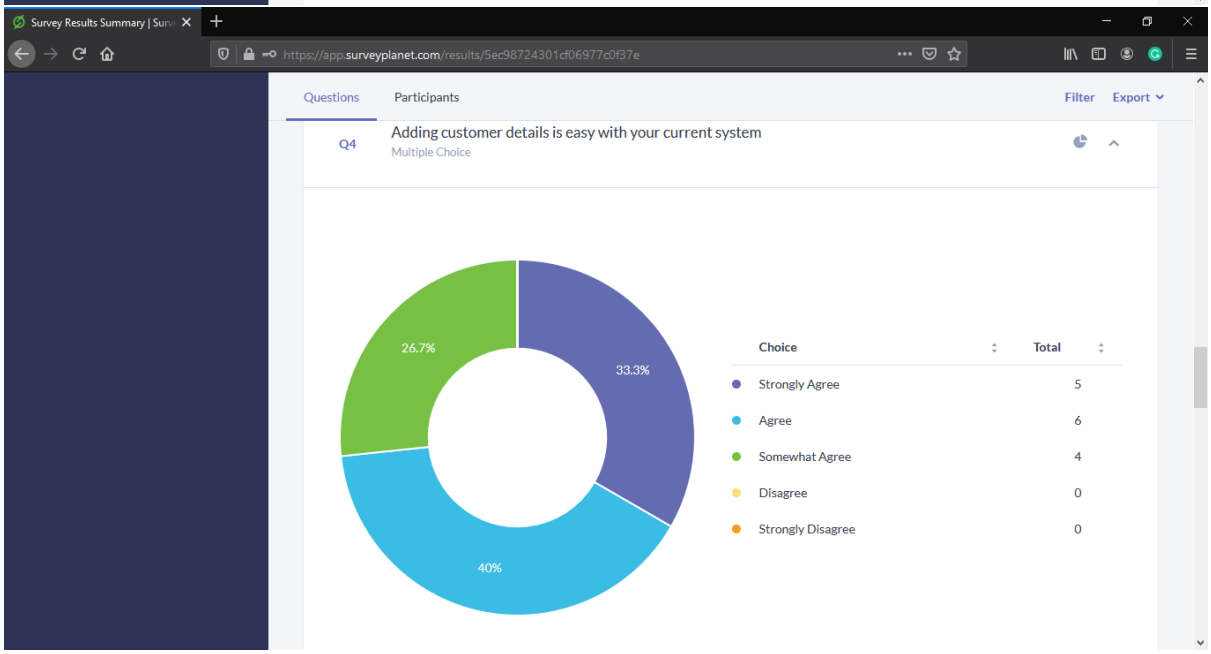
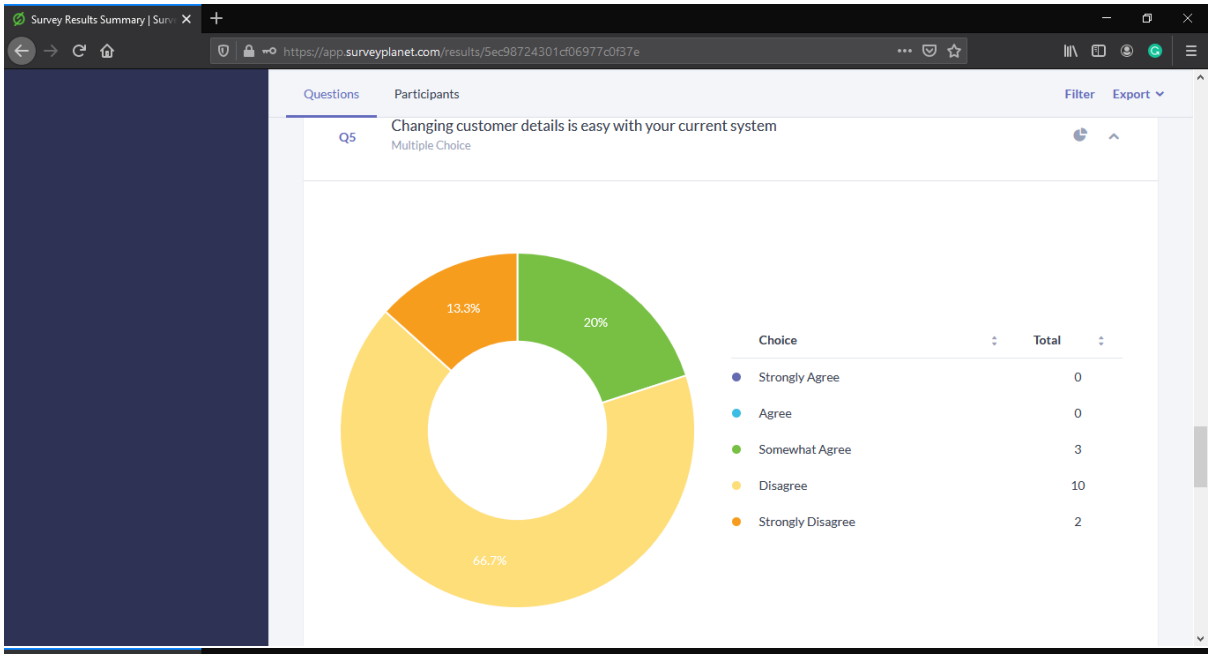
https://app.surveyplanet.com/results/5ec98724301cf06977c0f37e
Questions
Participants
Filter
Export
Q3
Searching for individual customer details is easy with your current sytem
Multiple Choice
13.3%
13.3%
33.3%
40%
Choice
Total
Strongly Agree 0
Agree 2
Somewhat Agree 6
Disagree 5
Strongly Disagree 2


Survey Results Summary | Surv
https://app.surveyplanet.com/results/5ec98724301cf06977c0f37e
Questions
Participants
Filter
Export
Q4
Adding customer details is easy with your current system
Multiple Choice
26.7%
33.3%
40%
Choice
Total
Strongly Agree 5
Agree 6
Somewhat Agree 4
Disagree 0
Strongly Disagree 0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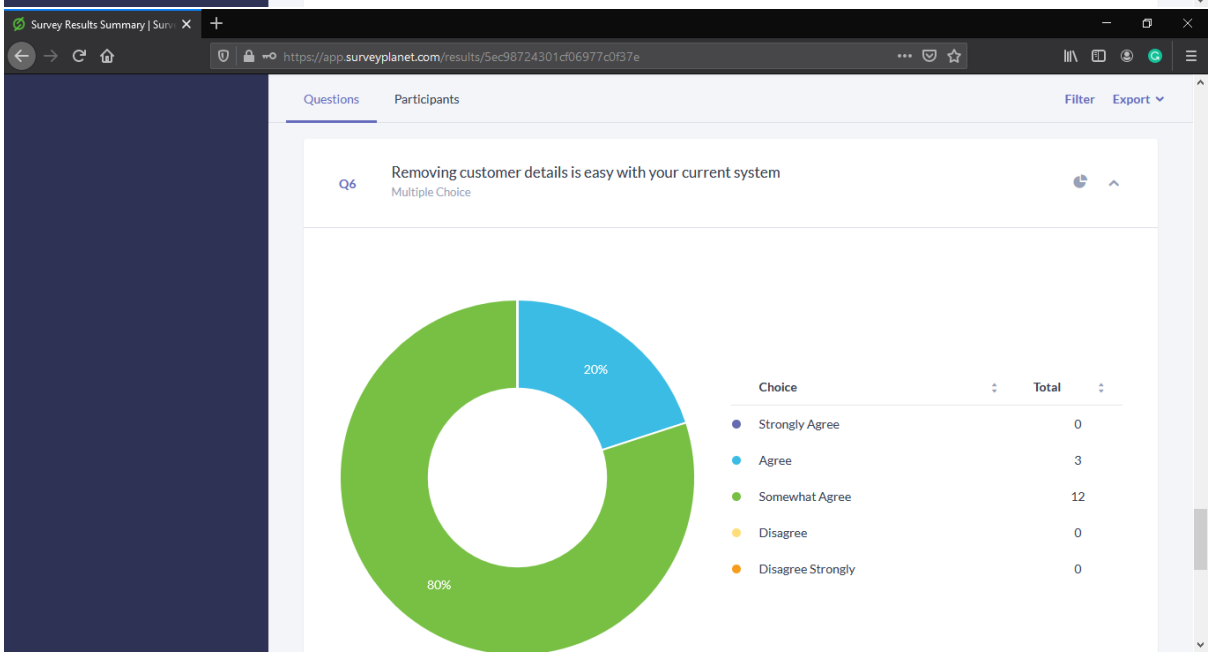
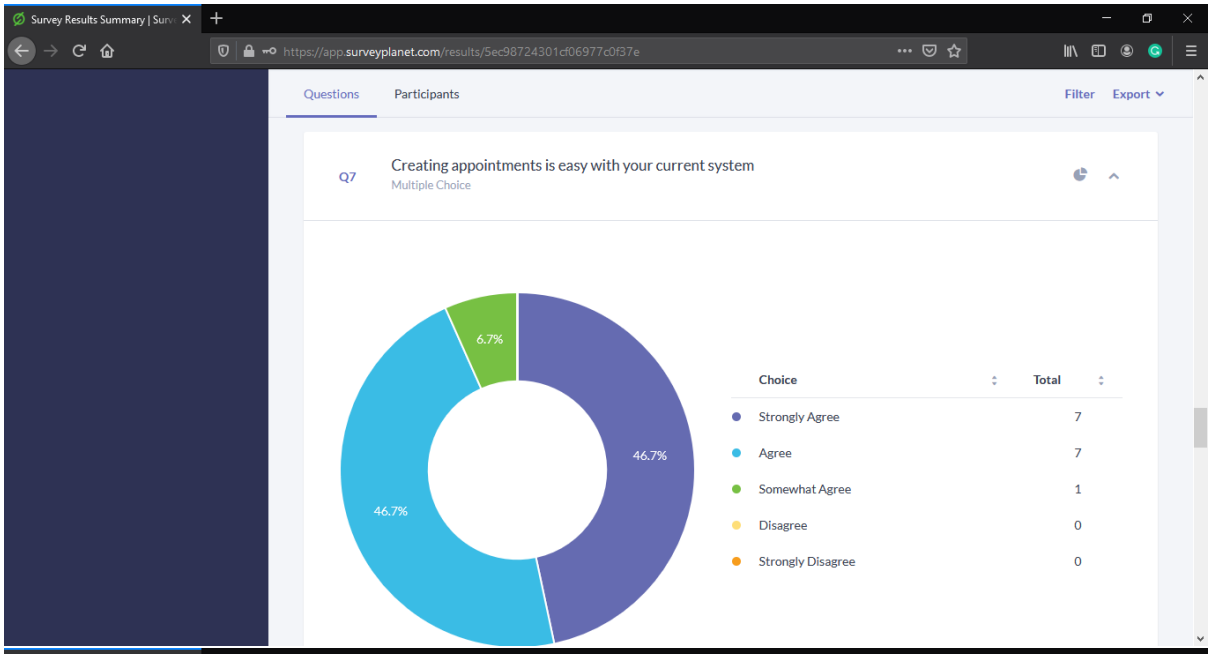
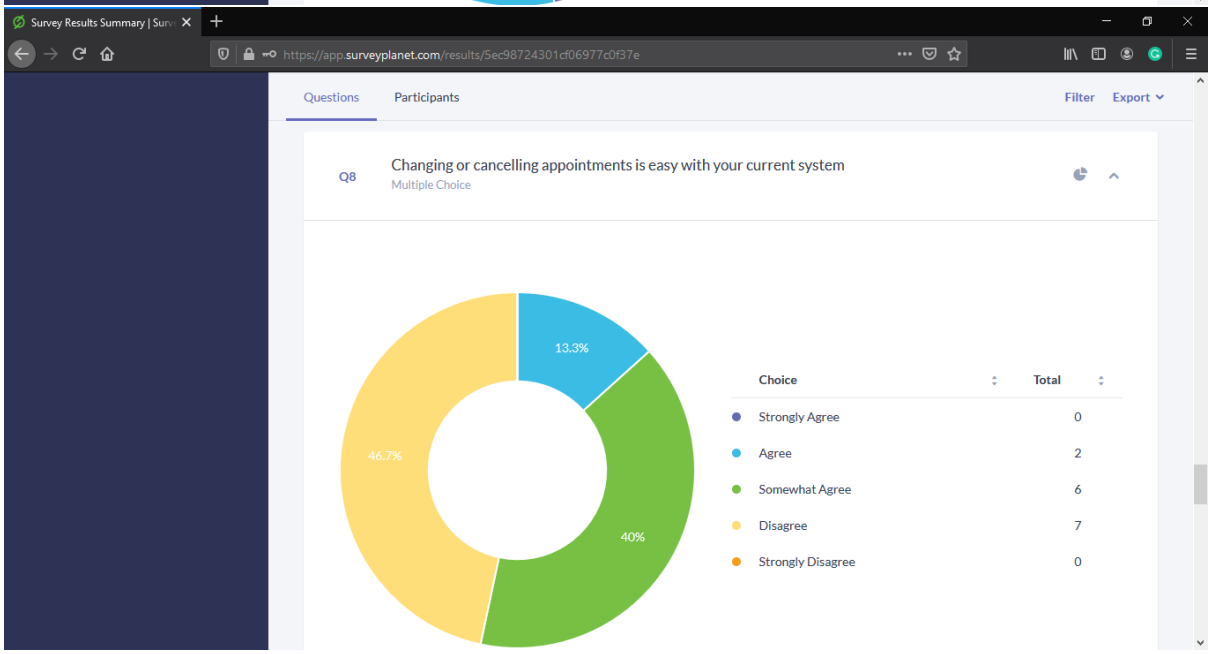
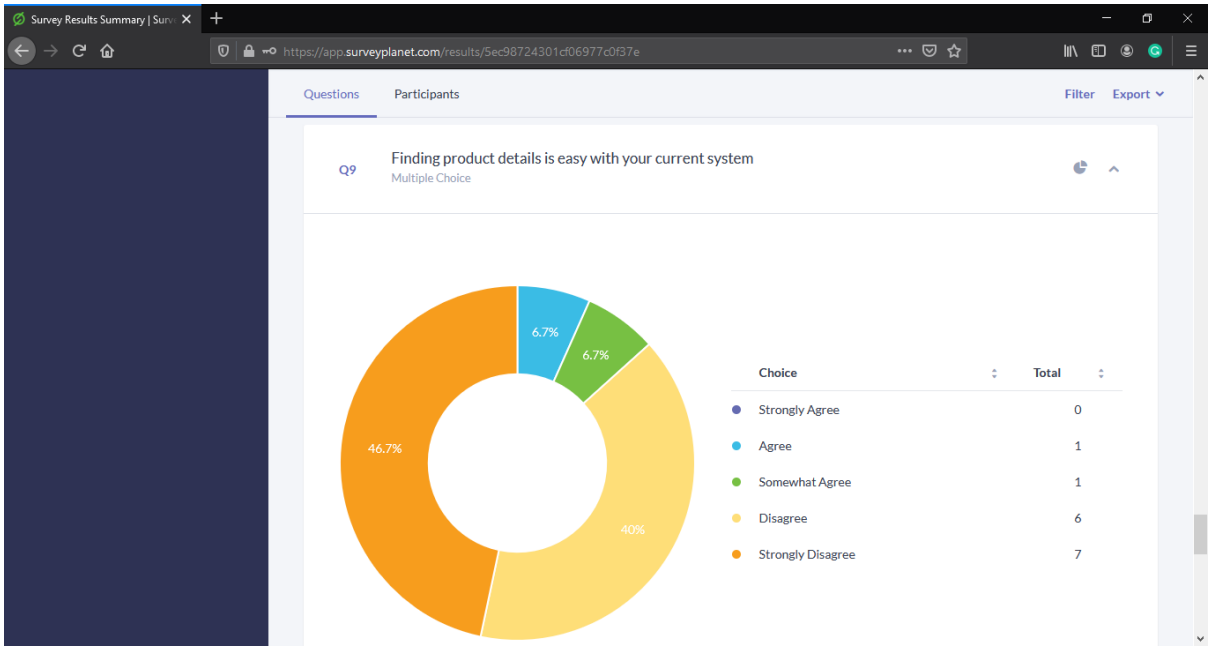
https://app.surveyplanet.com/results/5ec98724301cf06977c0f37e
Questions
Participants
Filter
Export
Q5
Changing customer details is easy with your current system
Multiple Choice
13.3%
20%
66.7%
Choice
Total
Strongly Agree 0
Agree 0
Somewhat Agree 3
Disagree 10
Strongly Disagree 2


Survey Results Summary | Surv
https://app.surveyplanet.com/results/5ec98724301cf06977c0f37e
Questions
Participants
Filter
Export
Q6
Removing customer details is easy with your current system
Multiple Choice
20%
80%
Choice
Total
Strongly Agree 0
Agree 3
Somewhat Agree 12
Disagree 0
Disagree Strongly 0


Survey Results Summary | Surv
https://app.surveyplanet.com/results/5ec98724301cf06977c0f37e
Questions
Participants
Filter
Export
Q7
Creating appointments is easy with your current system
Multiple Choice
6.7%
46.7%
46.7%
Choice
Total
Strongly Agree 7
Agree 7
Somewhat Agree 1
Disagree 0
Strongly Disagree 0


Survey Results Summary | Surv
https://app.surveyplanet.com/results/5ec98724301cf06977c0f37e
Questions
Participants
Filter
Export
Q8
Changing or cancelling appointments is easy with your current system
Multiple Choice
13.3%
46.7%
40%
Choice
Total
Strongly Agree 0
Agree 2
Somewhat Agree 6
Disagree 7
Strongly Disagree 0




Out of the 15 respondents of the survey, 10 answered the optional essay question at the end of the survey. This should highlight the significant problems of their current system, providing a scope into the requirements of the new system. The answers from the 10 respondents are recorded below:

| Date | Answers |
|---|---|
| Oct 13, 2020 | A method to easily find customer and product details would make the system much more efficient. |
| Oct 13, 2020 | My main concern would be to improve the security of our current system. |
| Oct 14, 2020 | Reducing the amount of paper required for our current system would be beneficial in terms of costs. |
| Nov 30, 2020 | The efficiency of the system could be improved with the ability to search for customer and product details more easily. |
| Nov 30, 2020 | A vital improvement required for our current system is security. Customer data is not as protected as it should be. |
| Nov 30, 2020 | Changing details of customers or appointments can prove to be an awkward task to carry out with our current system, therefore, a feature which makes this easier would be a great improvement. |
| Dec 1, 2020 | Finding documents regarding products, such as invoices, can be very time-consuming. A feature that could make finding these documents easier would be a significant improvement to the current system. |
| Dec 1, 2020 | A reduction in the amount of paper required would be an improvement to our current system. Paper takes up a lot of space. |
| Dec 1, 2020 | A feature that would make finding information regarding products, such as prices and invoices, would make my everyday tasks much easier. |
| Dec 1, 2020 | In my opinion, security is a significant flaw in our current system. A feature that would secure the data we store about our customers would be a massive improvement. |

## Analysis of Survey Answers

I analysed the answers made from the respondents of the online survey previously sent to them via email and I concluded that the following points can be made about the current system:

1. The current system is not easy to use and manage, with 40% of respondents disagreeing with the statement, and 20% strongly disagreeing. This is a general point; however, it indicates that a new digitised system is appropriate for this organisation.
2. The current system does not keep customer details secure, with 26.7% of respondents disagreeing with the statement, and 33.3% strongly disagreeing. Security of their system could be improved with a login function and access levels.
3. There is a mixed opinion on the ease of searching for customer details, with 40% of respondents somewhat agreeing with the statement, and 33.3% disagreeing. Searching for customer records could be made even more simple with a digitised system, where the user could search for a specific record using a unique ID or their name.
4. Adding customer records to the current system is easy, with 40% agreeing with the statement and 33.3% of respondents strongly agreeing. A similar digitised version of the form they use for adding records to their current system could be implemented into the new system.
5. Changing customer details is difficult, with 66.7% of respondents disagreeing with the statement and 13.3% strongly disagreeing. A function to update already existing records could be implemented into the new system to resolve this issue.
6. Removing customer details is relatively easy, with 80% of respondents saying they somewhat agree with the statement and the remaining 20% agreeing. However, the issues this process creates in terms of inefficiency and wastage of paper has been made prevalent in the interviews previously carried out with the stakeholders.
7. Creating appointments is easy with the current system, with 46.7% of respondents strongly agreeing with the statement, and another 46.7% agreeing. As previously mentioned, a form like that used in their current system could be digitised and implemented into their new system. Requesting a copy of this form could prove useful in the document sampling stage later in my investigation.
8. Changing or cancelling appointments is difficult, with most respondents (46.7%) saying that they disagree with the statement. As previously mentioned, a function to update already existing appointments could be implemented into the new system, alongside another function to delete records and appointments.
9. Finding product details is difficult, with 46.7% of respondents strongly disagreeing with the statement, and 40% disagreeing. A function to search for records could be implemented into the new system, where the user can input a unique ID or the name of the product to find a specific record.
10. The answers recorded from the 10 out of 15 respondents of the optional questions vary, however, in general they suggest the following points:
    - The security of the current system is a significant flaw.
    - Lots of paper is required for the current system, which can take up a lot of space and can create additional expenses for the business.
    - Searching for documents, customer details and product details can be very time-consuming and inefficient.
    - Making changes to records or appointments can be difficult to carry out.

These points create a powerful insight into the general requirements which can be used to create a design of the new system.

# Method 3 – Observation

Following my interview with Michael Gilsenan, I had a quick discussion with him about carrying out an observation of the day-to-day tasks carried out in the Camlough branch to better understand the inputs, processes and outputs required by the new system. I arranged two visits on the 4th January, and the 5th January.

On the 4th January, I decided my time would be best spent observing the tasks carried out by Catherine O'Connor, the head receptionist in Camlough, as I feel she will be utilising the new system more than the other stakeholders in Camlough. Calls were made by new customers throughout the day to book appointments for eye tests, and I paid close attention to the customer data she was writing on the forms, and where she was storing them. One of the first key issues that was made prevalent from my observation was the lack of security surrounding the storage of customer data. Forms were placed in a filing cabinet located behind the main desk, where it could be easily accessed by anybody within the building. I noticed locks were being used on the filing cabinets, however, Catherine had not been locking the filing cabinet after each use, and there were plenty of where it would be possible for unauthorised personnel to access the customer data.

Catherine had also been making orders for products from suppliers over the phone. Product names were required to make the orders alongside the quantity of each product required. Invoices were sent to her email and then printed off and stored in another filing cabinet. I took note of this as an output requirement for the new system.

I noticed that making changes to or cancelling appointments was quite an awkward task and took up a considerable amount of time, while also being inefficient. Lots of paper and storage space are required to accommodate these tasks, which can be a significant expense to the business. A digitised system could eliminate the need for additional storage and paper, saving the business money and improving the overall efficiency of the system.

On the 5th January, I observed the tasks carried out by Carol Ward, the manager in Camlough. I felt this was essential to acquire an understanding of the input, process, and output requirements of the managers and those with the highest access level, who would have access to files relating to staff members, such as payslips, contact details, etc. I chose the 5th January intentionally as I was informed this is the day payslips for the previous month are written out. Carol used a template to write out payslips for staff, which I will replicate in the digitised system, where the user can input the amount to be paid to each member of staff and print the payslip to a text file and convert it to a PDF to print.

I also observed the tasks carried out by Jennifer Meehan, an Optometrist in Camlough. This was to gain an insight into how prescriptions are written for customers. Like the process of creating payslips, a template is used to write prescriptions. Details of the customer and the prescription are written into a template and signed off by Jennifer. Copies of these prescriptions are then stored in a filing cabinet for future reference. These prescription templates will also be replicated in the digitised system, where the user can input the customer and prescription details and print the prescription to a text file and convert it to a PDF to print. Prescriptions can also be updated easily with a digitised system, addressing an issue made prevalent in my observation when a customer required a change made to their prescription and a new one had to be written out, which wastes paper and takes a considerable amount of time.

# Method 4 - Document Sampling

I sampled documents from Lee Opticians that would give me a better insight into what inputs and outputs are required by their new system.

## Invoices

I sampled invoices from some of their suppliers for the products they sell to their customers. This will provide me with information on some of their products and suppliers, which I can use to create a product table and a supplier table in their new system, alongside an order table to enable the user to print order invoices for orders made when needed, reducing storage space required for all their orders. Attributes for the product table that can be taken from this document could include product details e.g., description, unit price, total. Attributes for the supplier table that can be taken from this document could include the supplier's name, their contact details, their postcode.

**TOM FORD**

TOM FORD,
7 Howick Pl,
Westminster, London.
SW1P 1BB.
Phone: +44 (0)80080 83673

**INVOICE**

INVOICE # 058
DATE: 10/05/2020

**TO:**
Lee Opticians,
2 Crawfords Glen,
Camlough, Co. Armagh.
BT35 7JG.
Phone: +44 (0)28 3044 2612

**SHIP TO:**
Lee Opticians,
2 Crawfords Glen,
Camlough, Co. Armagh.
BT35 7JG.
Phone: +44 (0)28 3044 2612

**COMMENTS OR SPECIAL INSTRUCTIONS:**

| SALESPERSON | P.O. NUMBER | REQUISITIONER | SHIPPED VIA | F.O.B. POINT | TERMS |
|---|---|---|---|---|---|
| | | | | | Due on receipt |

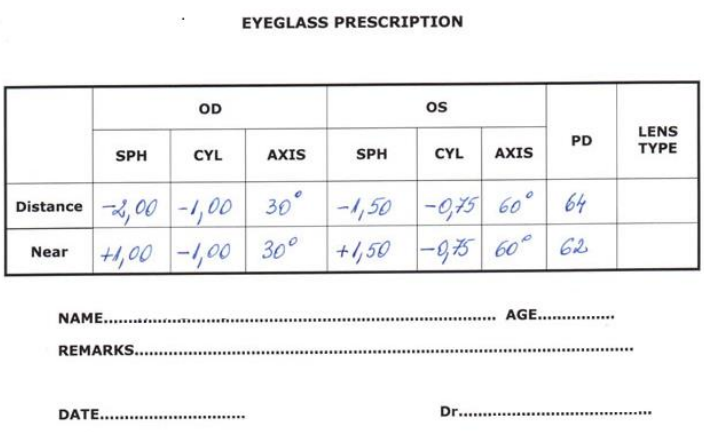
| QUANTITY | DESCRIPTION | UNIT PRICE | TOTAL |
|---|---|---|---|
| 3 | SQUARE OPTICAL FRAME FT5313 | £147.20 | £441.60 |
| 3 | SOFT ROUND OPTICAL FRAME FT5401 | £147.20 | £441.60 |
| 2 | BLUE BLOCK SOFT ROUND OPTICALS FT5631-B | £185.60 | £371.20 |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | **SUBTOTAL** | **£1254.40** |
| | | SALES TAX | £250.88 |
| | | SHIPPING & HANDLING | £5.00 |
| | | TOTAL DUE | £1510.28 |

Make all cheques payable to TOM FORD
If you have any questions concerning this invoice, contact TOM FORD, London, +44 (0)80080 83673

**THANK YOU FOR YOUR BUSINESS!**

## Prescriptions

I also sampled a prescription, which will provide me with attributes I can use to generate prescriptions from within their new system instead of having to fill out blank templates by hand. This will save time for the members of staff, improving the efficiency of the system. Some of the details on this prescription have been censored to protect the identity of the customer. Attributes for the prescription table that can be taken from this document could include details of the optometrist writing the prescription, the customer the prescription is being written for and what is being prescribed.



EYEGLASS PRESCRIPTION

| | OD | | | OS | | | PD | LENS TYPE |
|---|---|---|---|---|---|---|---|---|
| | SPH | CYL | AXIS | SPH | CYL | AXIS | | |
| Distance | -2,00 | -1,00 | 30° | -1,50 | -0,75 | 60° | 64 | |
| Near | +1,00 | -1,00 | 30° | +1,50 | -0,75 | 60° | 62 | |

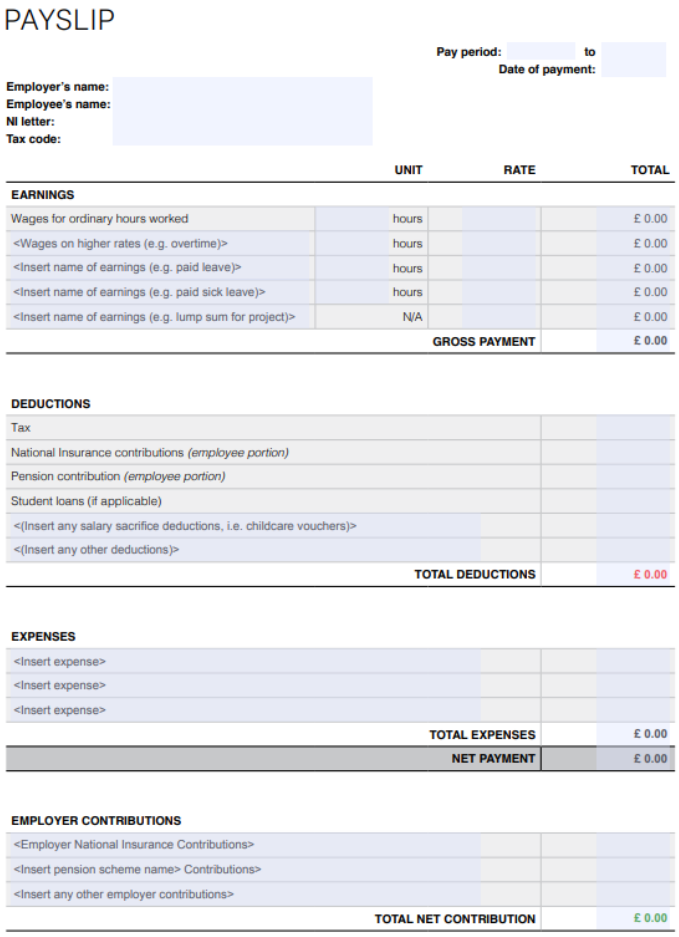
NAME..... AGE.....

REMARKS.....

DATE..... Dr.....

## Payslips

I sampled a payslip template to find out the data required to create the ability to generate payslips from the new system. Attributes that can be taken from this template include the name of the employer and employee, the national insurance and tax details, the date of payment and the pay period, the hourly rate, and the total. These attributes can be used to create a function to generate payslips from the data input by the user.



PAYSLIP

**Pay period:** to
**Date of payment:**

**Employer's name:**
**Employee's name:**
**NI letter:**
**Tax code:**

| | UNIT | RATE | TOTAL |
|---|---|---|---|
| **EARNINGS** | | | |
| Wages for ordinary hours worked | hours | | £ 0.00 |
| <Wages on higher rates (e.g. overtime)> | hours | | £ 0.00 |
| <Insert name of earnings (e.g. paid leave)> | hours | | £ 0.00 |
| <Insert name of earnings (e.g. paid sick leave)> | hours | | £ 0.00 |
| <Insert name of earnings (e.g. lump sum for project)> | N/A | | £ 0.00 |
| | | **GROSS PAYMENT** | **£ 0.00** |

| **DEDUCTIONS** | |
|---|---|
| Tax | |
| National Insurance contributions *(employee portion)* | |
| Pension contribution *(employee portion)* | |
| Student loans (if applicable) | |
| <(Insert any salary sacrifice deductions, i.e. childcare vouchers)> | |
| <(Insert any other deductions)> | |
| **TOTAL DEDUCTIONS** | **£ 0.00** |

| **EXPENSES** | |
|---|---|
| <Insert expense> | |
| <Insert expense> | |
| <Insert expense> | |
| **TOTAL EXPENSES** | **£ 0.00** |
| **NET PAYMENT** | **£ 0.00** |

| **EMPLOYER CONTRIBUTIONS** | |
|---|---|
| <Employer National Insurance Contributions> | |
| <Insert pension scheme name> Contributions> | |
| <Insert any other employer contributions> | |
| **TOTAL NET CONTRIBUTION** | **£ 0.00** |

## Customer Form

I sampled a blank customer form provided to new customers to gain an understanding of the attributes associated with a customer record. Attributes I identified from the customer form include their name, date of birth, address, email, telephone, and medical conditions. I would like to create a digitised version of this form to use in the new system, therefore staff will already be familiar with the data required and training them to use the new system should be easier.

Customer Form

Lee Opticians

Name

Date Of Birth

DD-MM-YYYY

Address

Email

Phone Number

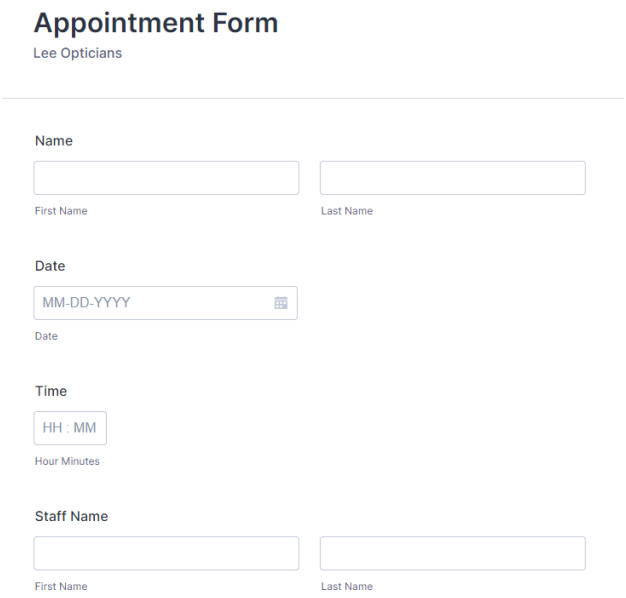
(000) 000-0000

Medical Conditions

Type here...

## Appointment Form

I sampled a blank appointment form to gain an understanding of the attributes associated with creating an appointment form. Attributes I identified from the appointment form include the customer's name, the date and time of the appointment, and the staff member booked for the appointment. I would like to create a digitised version of this form to use in the new system, therefore staff will already be familiar with the data required and training them to use the new system should be easier.



# Analysis of Document Sampling

## Inputs

The following inputs have been identified in Lee Opticians' current system following the document sampling:

- Customer details
- Appointment details
- Product details
- Supplier details
- Order details
- Staff details
- Prescription details

These inputs will be used for the development of the new system, to ensure staff have a familiarity of the data to be entered when using the system and adding data to the forms. I may also include branch details as an input for the new system, to enable users to search for the contact details of each branch.

## Processes

The following processes have been identified in the current system:

- Storage of customer details
- Storage of appointment details
- Storage of supplier details
- Storage of order invoices
- Storage of customer prescriptions
- Storage of staff details
- Searching for records
- Updating records
- Deleting records

These processes will also be used for the development of the new system, however, they will be improved on, as currently the processes are inefficient and some difficult to perform. Searching for and deleting records will be made simpler with the new system, while storage of records will be more secure.

## Outputs

The following outputs have been identified in the current system:

- Prescriptions for customers
- Order invoices
- Payslips for staff

These outputs will also be used for the development of the new system, where the user can input the details of orders, prescriptions, or payslips and write them to a text file. The text file can then be saved as a PDF and printed.

## Limitations of the Current System

The investigation carried out presented a number of limitations to Lee Opticians' current system. These limitations are summarised below:

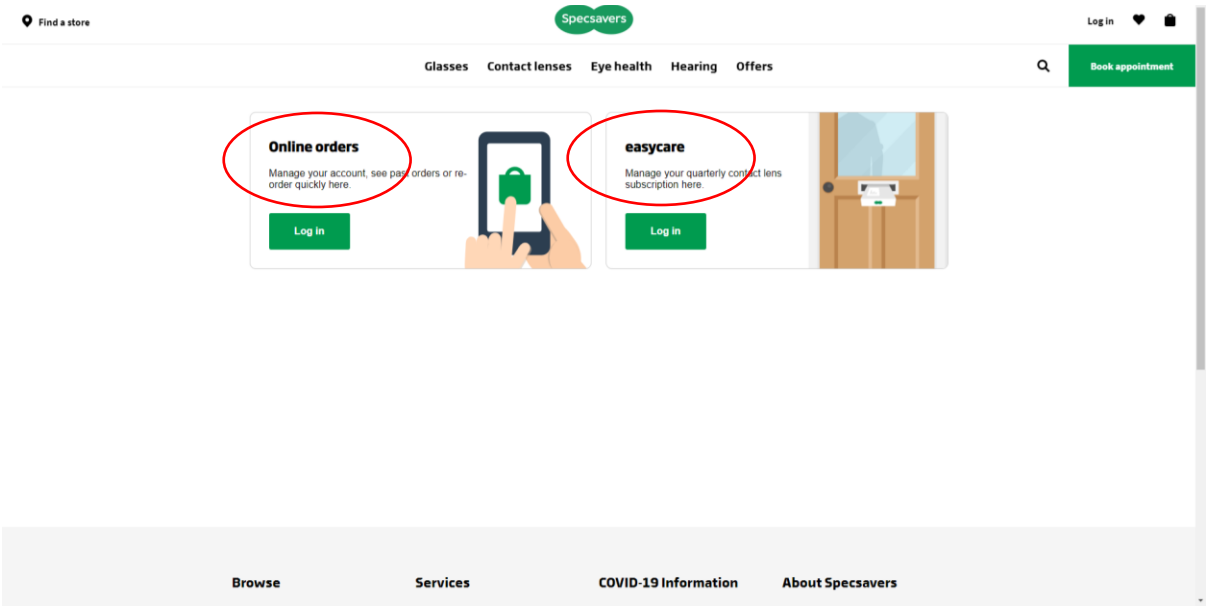
- Concerning lack of security surrounding the storage of sensitive customer data. Files are stored in a filing cabinet, which is not always locked.
- Organisation and maintainability issues surrounding the storage of data. It has been made prevalent through the interviews and the online survey that making changes to and searching for customer and product details can be difficult and very time-consuming.
- A significant amount of paper and storage space required for the current system, which can be very expensive for the business. Records are stored in filing cabinets, which can take up a lot of space.
- Possibility of data inconsistency, data redundancy, and data duplication with the current system in place, all of which impact the data integrity.
- Only one member of staff can access a record at one time, which can be inefficient. A digitised system would allow access to one record from multiple computers at any one time.

# Desk Based Research

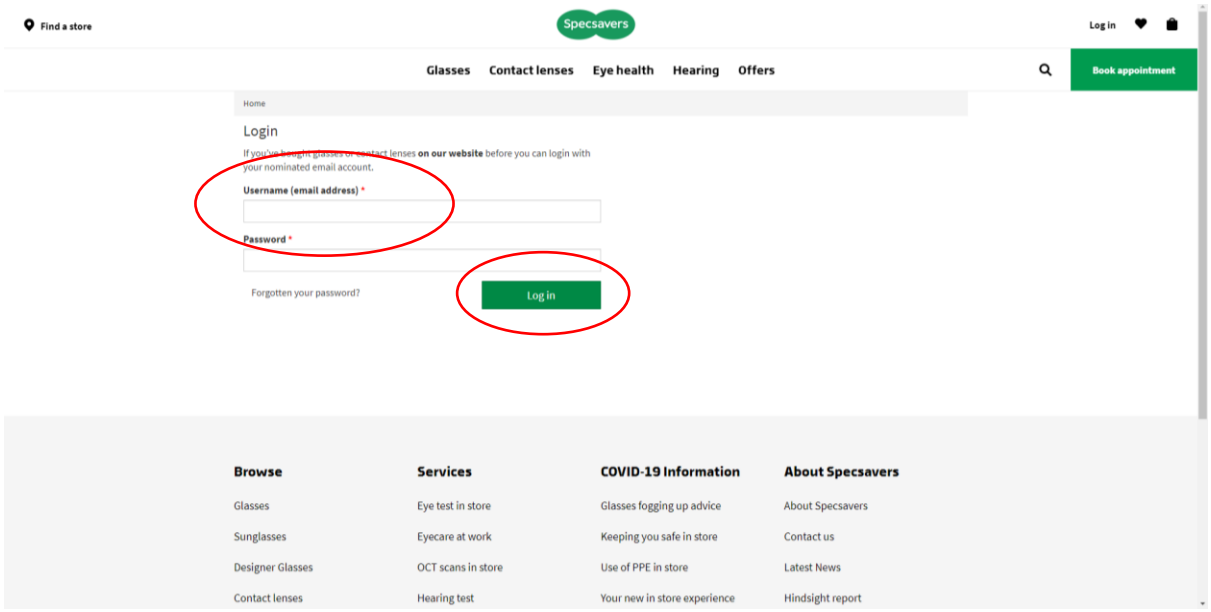
Following my investigation into Lee Opticians' current system, I have a sufficient insight into the requirements of the new system, formed around the issues previously uncovered. I felt it would be useful to carry research into similar systems, e.g., login screens, to base the design of the new system on.

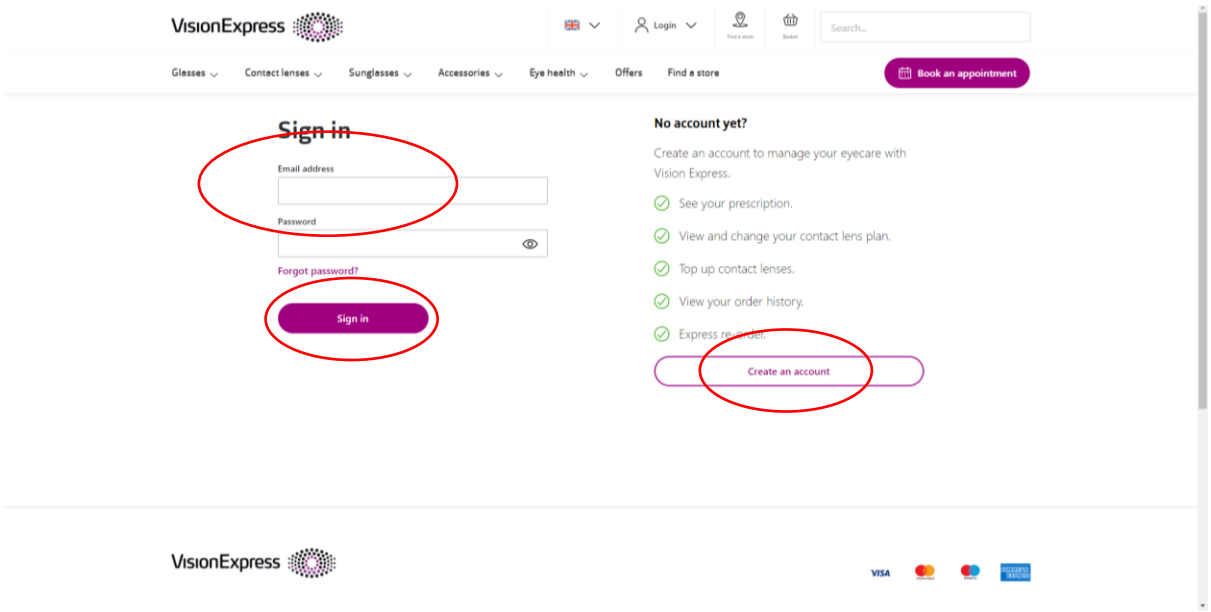
## Login Screens

I researched into login screens with different access levels or user types. I visited Specsavers' website to find that there were different user types (or access levels) for users to select when signing up or logging in. Each user type will have a different number of options depending on what they are permitted to access. A similar type of access level system should be implemented into Lee Opticians' new system.



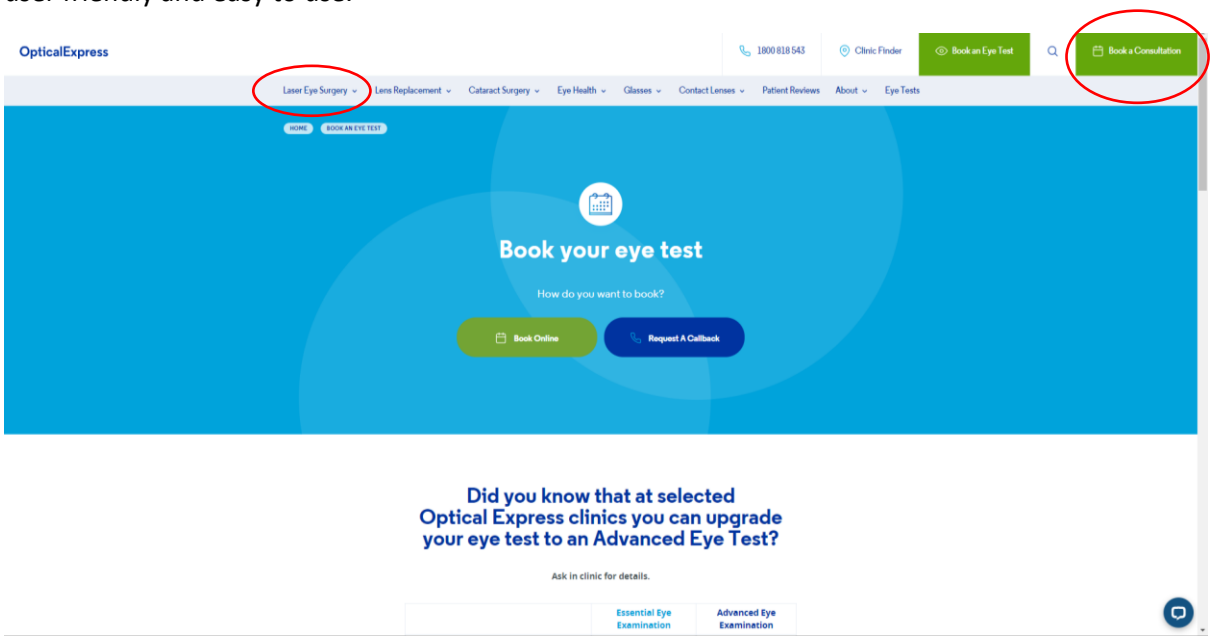

The design of the login screens across the sites I visited are quite similar, where it is kept simple with an entry for the email or telephone number, an entry for the password, and a button to log in, register or reset the password. Therefore, it may be a good idea to follow this layout when designing the login screen for Lee Opticians, ensuring the system is user friendly and easy to use, however, buttons to register a new user or reset the password will not be required, as this will be done by a manager or myself.


Find a store
Specsavers
Log in
Glasses
Contact lenses
Eye health
Hearing
Offers
Book appointment
Home
Login
If you've bought glasses or contact lenses on our website before you can login with your nominated email account.
Username (email address) *
Password *
Forgotten your password?
Log in
Browse
Glasses
Sunglasses
Designer Glasses
Contact lenses
Services
Eye test in store
Eyecare at work
OCT scans in store
Hearing test
COVID-19 Information
Glasses fogging up advice
Keeping you safe in store
Use of PPE in store
Your new in store experience
About Specsavers
About Specsavers
Contact us
Latest News
Hindsight report

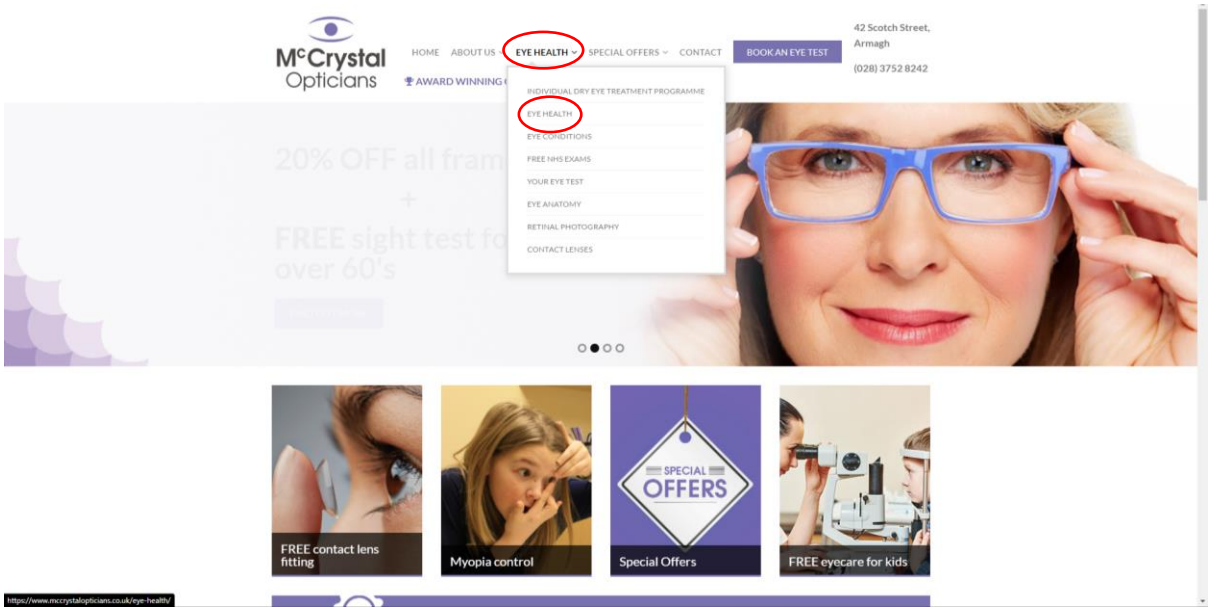

VisionExpress
Login
Search...
Glasses
Contact lenses
Sunglasses
Accessories
Eye health
Offers
Find a store
Book an appointment
Sign in
Email address
Password
Forgot password?
Sign in
No account yet?
Create an account to manage your eyecare with Vision Express.
See your prescription.
View and change your contact lens plan.
Top up contact lenses.
View your order history.
Express re-order.
Create an account
VisionExpress

## Menu

A perfect example of a good menu screen is on the Optical Express website. On the top of the page, there is a navigation menu where there are several different buttons and links to access different areas of the website. The user then selects the menu option they want to go to. The menu for the new system for Lee Opticians should be similar, where the user sees a several available options on the GUI and can simply click the option they wish to go to. This further ensures the system is kept user friendly and easy to use.

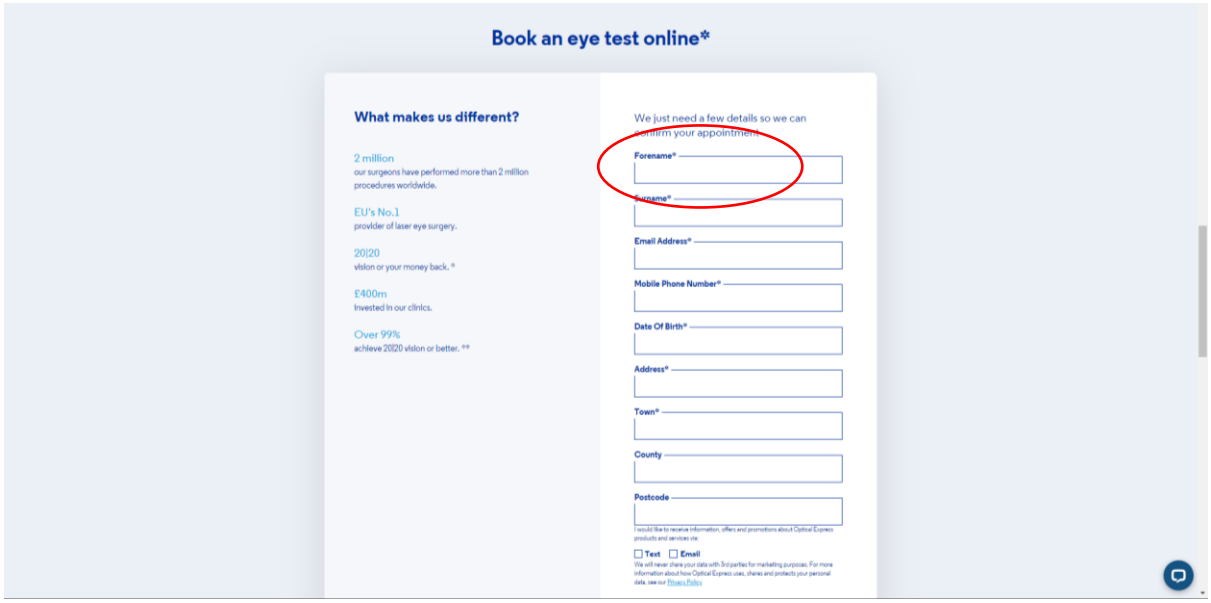



Another good example of a menu is on McCrystal Opticians' website, where each of the different menu titles and subtitles are clearly displayed, so the user knows where to go to access the part of the website they wish to view. Menu options in Lee Opticians' new system should be clearly labelled to ensure the navigation of the new system is easy to perform.

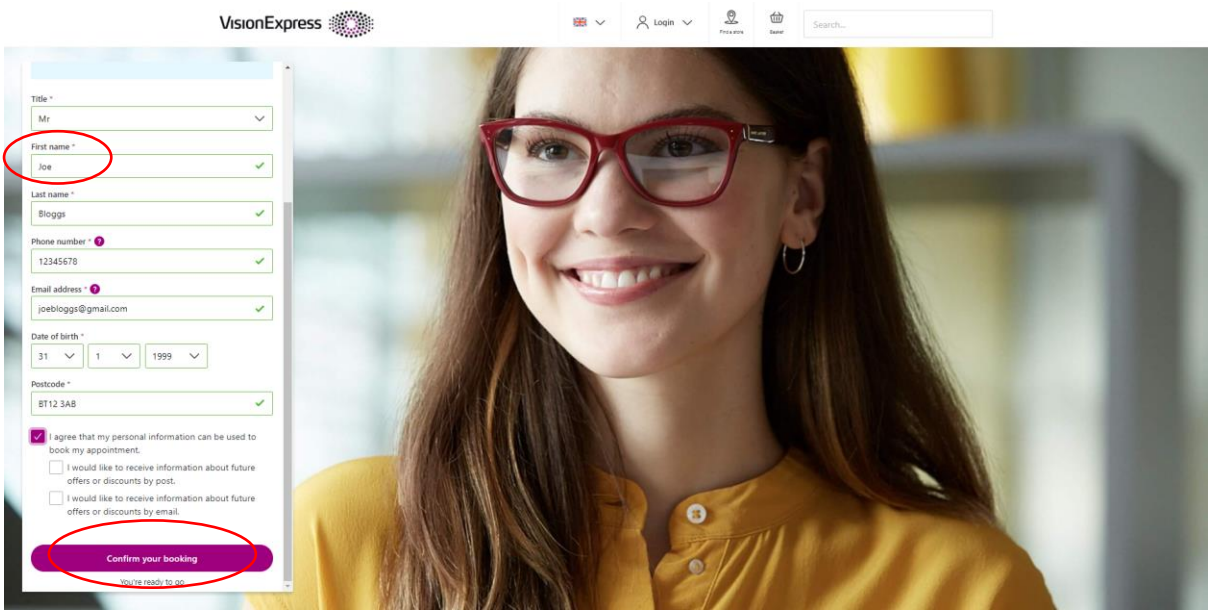


## Forms

I visited different optician websites with online booking systems to find a great example of a form on Optical Express. The entry boxes are clearly labelled, and the form is user friendly. Entry boxes on Lee Opticians' new system should be clearly labelled and the data required should be easy to interpret.  Attributes can also be taken from this form to be used in the appointments table for the new system.

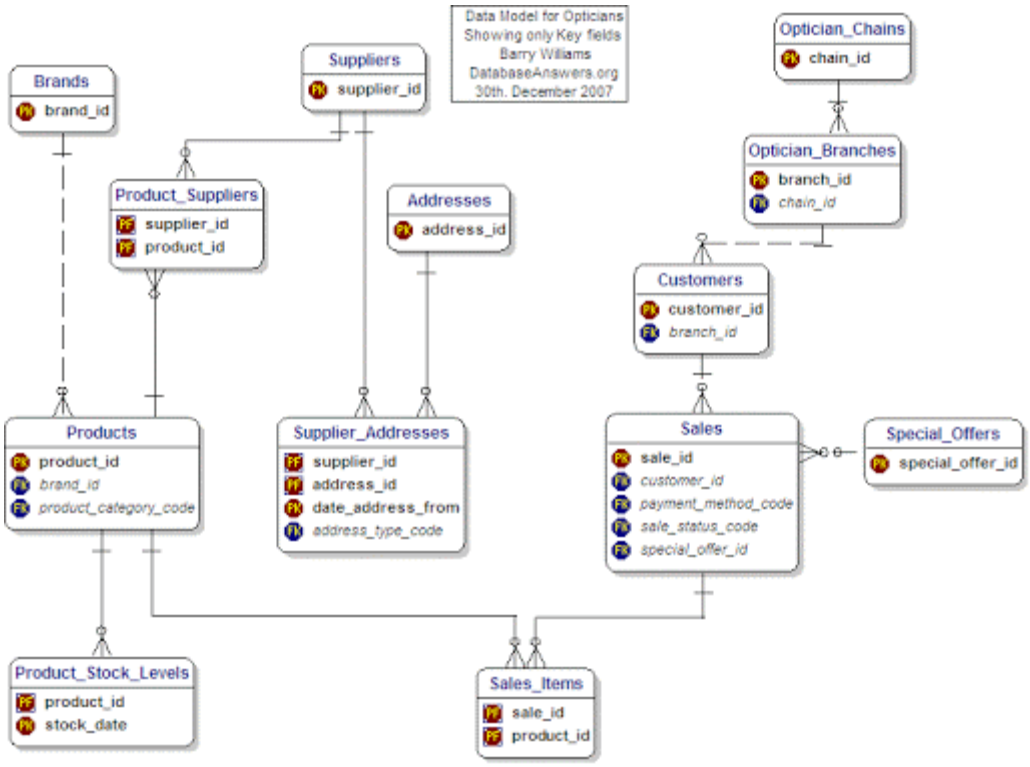



Similarly, the appointment form on Vision Express' website includes entry boxes that are clearly labelled, with a button to confirm the booking using the data input by the user. Buttons should be used on the forms for Lee Opticians' new system to ensure it can be used easily.



## Relational Databases

I have decided a relational database would be most suitable for the new system given the number of entities to be included in the database. A relational database will eliminate issues such as data redundancy and data inconsistency, while improving the data integrity of the database.




I researched relational database models for opticians online and found this entity-relationship diagram (ERD). As seen in this ERD, there are several different tables linked together with relationships; one-to-one, one-to-many. A similar ERD should be produced for Lee Opticians during the design stage and should include a similar set of relationships and entities.

# Specification

The purpose of the specification is to provide a list of aims or requirements to be considered when developing the new system for Lee Opticians. General aims of the system will be summarised below, and later expanded on in the stakeholder requirements and success criteria.

- A database to store tables and records for the different entities related to Lee Opticians.
- A user-friendly graphical user interface to use and navigate the system.
- Outputs generated using text files or screen outputs.
- The ability to add, make changes to, delete, and search records in a table.
- Security measures, such as a login screen, to ensure only staff can access the system, or access levels, to restrict access where appropriate.

## Stakeholders and Their Requirements

### Managers

Managers should have full access to the system. Their specific requirements are summarised below:

- A user-friendly graphical user interface to input and manage data in the system.
- A function to add, edit, view, and remove data about employees within the business.
- A function to create payslips for employees.
- A function to view and print invoices from suppliers.

### Receptionists

Receptionists should have access to areas of the system surrounding customer data and creating orders with suppliers. Their specific requirements are summarised below:

- A user-friendly graphical user interface to input and manage data in the system.
- A function to add, edit, view, and remove data about customers of the business.
- A function to add, edit, view, and remove appointments made by customers.
- A function to add, edit, view, and remove orders made for frames, lenses, etc.
- A function to view and print invoices from suppliers.

### Optometrists

Optometrists should have access to areas of the system surrounding customer data and prescriptions. Their specific requirements are summarised below:

- A user-friendly graphical user interface to input and manage data in the system.
- A function to add, edit, view, and remove data about customers of the business.
- A function to add, edit, view, and remove appointments made by customers.
- A function to print prescriptions from customer appointments.

### Customers

Customer requirements are summarised below:

- Signing up as a customer is simple and convenient.
- Customer data is kept secure and follows the legislation surrounding data protection.

- Booking appointments is simple and convenient.
- Getting prescriptions is simple and convenient.

## Suppliers

Supplier requirements are summarised below:

- Orders are received and fulfilled without complications at the fault of Lee Opticians.

# Success Criteria

## Managers

The following requirements for the mangers have been identified from the investigation carried out into the current system:

- Create a table to store information about the members of staff working in each branch.
- Allow the manager to add records to the staff table when a new member of staff is employed.
- Allow the manager to search for individual staff records to find contact details etc.
- Allow the manager to remove staff records if required.
- Allow the manager to create payslips for staff and print them or email them as a PDF.
- Create a login table where each member of staff is allocated an ID and a password to use to login to the system. Access levels are also included on this table.
- Allow the manager to change or update login details if required e.g., staff member forgets their password, staff member receives a promotion that requires a higher access level.
- Allow the manager to access all areas of the system, including those mentioned in the requirements of other stakeholders.
- Create a table where the details of each branch are stored including the town, postcode, and contact details of each Lee Opticians branch.
- Allow the manager to search for the branch details by inputting the town or an ID.

## Receptionists

The following requirements for the receptionists have been identified from the investigation carried out into the current system:

- Create a table to store information about customers.
- Allow the receptionist to create records for new customers.
- Allow the receptionist to make changes to or delete customer records if required.
- Allow the receptionist to search for customer records.
- Create a table to store information about products, including the name, description, and price.
- Allow the receptionist to create records for new products.
- Allow the receptionist to make changes to and delete product records if required e.g., price of a product changes.
- Allow the receptionist to search for a product record e.g., to find the price.
- Create a table to store information about suppliers, including their name, postcode, and contact details.
- Allow the receptionist to create records for new suppliers.
- Allow the receptionist to make changes to and delete supplier records if required e.g., a supplier is no longer in use.
- Allow the receptionist to search for supplier record e.g., to find contact details.
- Create a table to store information about orders made with suppliers for products, including the products included on the order, the quantity, and the total cost of the order.
- Allow the receptionist to create records for orders made with suppliers.
- Allow the receptionist to make changes to or delete an order record, e.g., if an order changes or is cancelled.
- Allow the receptionist to search for an order record.

- Allow the receptionist to generate invoices for order records using a text file, where it can then be converted to a PDF and printed.
- Create a table to store information about appointments being made by customers.
- Allow the receptionist to create records for new appointments.
- Allow the receptionist to make changes to or delete an appointment record, e.g., a customer requests a cancellation.
- Allow the receptionist to search for an appointment record.

## Optometrists

- Create a table to store information about prescriptions written for customers.
- Allow an optometrist to add records to the prescriptions table.
- Allow an optometrist to make changes to or delete a prescription record if required.
- Allow an optometrist to search for a prescription record.
- Allow an optometrist to generate prescriptions for prescription records using a text file, where it can then be converted to a PDF and printed.

## Overall

- Ensure the system keeps sensitive data secure using a login screen and access levels.
- Create a backup procedure for the system to recover from in the event of data loss.
- Create a user-friendly graphical user interface that is easy to use and navigate.
- Use validation methods to ensure the data entered into the tables is reasonable and correct.
- Normalise data to 3NF to improve data integrity and prevent issues such as data redundancy or data inconsistency.
- Create screen outputs to prompt users of any notifications, instructions, or errors.
- Create text file outputs for prescriptions and order invoices.

# Methods to be Used

I have chosen several methods to be used for the development of the new system for Lee Opticians. These methods are chosen with consideration to my own personal knowledge and their suitability for the user requirements of Lee Opticians. They will assist me in the design of the system.

I have decided to use Python for the development of the new system for Lee Opticians. Python is a relatively simple language and offers supports for a number of useful modules. One of which is Tkinter, which can be used to create the graphical user interface (GUI) for the system, as Python does not offer strong support for GUIs. I have decided to use a GUI for this system as there is a range of IT knowledge amongst the staff, therefore it is important that the new system is user friendly and easy to navigate and understand. Tkinter will be used to make the screens of the system e.g., login screen, menu screen, data entry forms. I have a reasonable knowledge of Python as I have used it to develop projects before, however, Tkinter is unfamiliar to me, therefore, research into the documentation and perhaps even tutorial videos will be required. Python is also an easy language to read and understand, making maintenance and potential updates in the future much easier to perform if it is done by a different programmer.

Self-documenting identifiers and comments will also be used throughout my code, further expanding on the easiness to read and understand if another programmer ever needed access to the code to maintain or update the system in the future. Variable names will be made easy to understand to also contribute towards maintainability and performing updates.

Python will be used in combination with the SQLite3 module, a relational database management system, which will be used to create the tables to store records. It is lightweight and does not require a separate server process, saving the Lee Opticians from additional hardware costs. I am not familiar with using SQLite3 from any of my previous projects, however, it does seem relatively easy to learn and understand from having  a quick glance at the documentation, therefore I feel it is most suitable for developing this system. Queries can be created using SQLite3 to search for individual records following specific criteria, resolving the issues surrounding searching for records previously mentioned by members of staff. Using a relational database also improves data security, essential for a business such as Lee Opticians, where sensitive customer data is stored and used on a regular basis. The database will be normalised to third normal form (3NF). Normalisation is a technique of organising data in the database to eliminate problems such as data redundancy and data inconsistency to improve data integrity. When a database is in 3NF, non-key dependencies are removed. Normalising the database to a level higher than 3NF will become much more complicated, which is not suitable for Lee Opticians' requirements.

Validation methods will be implemented into the new system to ensure any data entered is reasonable and correct. Type checks will be used on the primary and foreign keys of each table to ensure only an integer can be entered. I also plan to use Tkinter message boxes to alert the user if an error occurs, improving on the user friendliness of the system. Presence checks will be used on compulsory fields to prevent null fields, and length checks will also be used on several fields, to ensure the data entered is reasonable.

Security measures will also be required for the new system. To implement this, I have decided to use a login screen and access levels for each user. A login table will be created using SQLite3, and the table will include staffID, password, and access level fields. The user will type their staffID and password into a login screen made with Tkinter, and the inputs will be checked against the data

stored in the login table to check if they match. If they match, a main menu screen will open, otherwise the user will be presented with an error message. The system will also check for the access level included on the record and restrict the user accordingly. This addresses the issue of security highlighted in my investigation into their current system.

As previously identified in their current system, there are a range of outputs created, such as prescriptions, order invoices, and payslips. I would like to recreate these outputs in the new system, where users can input relevant details and write these details to a text (.txt) file, where it can be saved as a PDF file and printed. Text files will have a structure where the record is easy to read and understand. Screen outputs will also be included in the new system, such as Tkinter message boxes displaying query search results, notifications, instructions, and error messages. Screen outputs further develop on the user-friendliness of the system.