

National College of Ireland

BSHCSD4

Software Development

2023-2024

Aidan Smith

21105774

x21105774@student.ncirl.ie

Ecommerce Application Technical Report

Contents

Executive Summary	2
1.0 Introduction	2
1.1. Background	2
1.2. Aims	3
1.3. Technology	3
1.4. Structure	4
2.0 System	4
2.1. Requirements	4
2.1.1. Functional Requirements	5
2.1.1.1. Use Case Diagram	5
2.1.1.2. Requirement 1 User Registration	5
2.1.1.3. Description & Priority	5
2.1.1.4. Requirement 2 Search Function	5
2.1.1.5. Description & Priority	5
2.1.1.6. Requirement 3 Manage Shop	5
2.1.1.7. Description & Priority	5
2.1.1.8. Requirement 4 Cart	5
2.1.1.9. Description & Priority	5
2.1.1.10. Requirement 5 Stripe	6
2.1.1.11. Description & Priority	6
2.1.1.12. Use Case 1 User Registration	6
2.1.1.13. Use Case 2 Search Function	8
2.1.1.14. Use Case 3 Manage Shop	9
2.1.2. Data Requirements	10
2.1.3. User Requirements	11
2.1.4. Environmental Requirements	11
2.1.5. Usability Requirements	11
2.2. Design & Architecture	11
2.3. Implementation	12
2.4. Graphical User Interface (GUI)	15
2.5. Testing	18
2.6. Evaluation	18
3.0 Conclusions	

4.0	Further Development or Research	19
5.0	Appendices	20
5.1.	Project Proposal	20
1.0	Objectives	21
2.0	Background	22
3.0	State of the Art	22
4.0	Technical Approach	22
5.0	Technical Details	23
6.0	Special Resources Required	23
7.0	Project Plan	23
8.0	Testing	25
5.2.	Reflective Journals	25
BSHCS	5D4	26

Executive Summary

Max 300 words. Summarise the key points of the report. Restate the purpose of the report, highlight the major points of the report, and describe any results, conclusions, or recommendations from the report.

1.0 Introduction

1.1. Background

I undertook this project as I saw it as an interesting way to learn new technologies I have never over the course of my studies worked with so many different technologies for one application and the challenges that come with that. Also being new to all of these technologies was also interesting as I would get to learn how all these technologies worked, how they worked together and the processes that it takes to set up and maintain services of their scale. I had been looking at these types of projects before undergoing this project but had never tackled one myself. A project that focuses on functioning similar to an actual enterprise level project had me very interested in pursuing and it still does. I enjoy working on projects that I can see myself using in the real world and that is why I chose to undertake this project everyone has once in their life had the experience of walking into a clothing shop finding something that you really like and there not been one item on display in your size. You would then need to go and ask a staff member if they have it in the back or if it can be ordered online but this app stops that as long as there is one version of the item there, they can scan it and be brought to the page to purchase it. They can view all the available sizes and order it for delivery. This concept matched with the new technologies that I would be using are why I chose to undertake this project.

1.2. Aims

This project aims to provide the user with a seamless experience where they can interact with the system as much as they could a fully build enterprise application the idea of the project to allow users to scan a QR code on an item that they find in person and be brought instantly to the store page for that item where they can view all the available listings. The project sets out to solve the problems of "do they have this item in my size?", "Maybe they have it in the back" instead of having to ask an employee to go and check you are able to just scan one item and view all the available listings for that item. Say they sell a pattern shirt the user really wants instead of searching around and hoping to find one in person or browsing the stores website in the hopes of finding it with one scan they will be brought to the store page where they can view all available listings and order it for delivery. This project aims to provide a application with sensible functionality such as a payment management system, a login system, a database to store user information and order information, a hosted application so it can be browsed to on the internet and finally a order confirmation page with delivery information that can be changed by the admin.

1.3. Technology

The technology that I will use to create the application is React and Node.js these are applications that I have had a little bit of experience with in the past but not enough to say that I am comfortable with these technologies. React and Node are perfect for creating the frontend and backend of the application as they are popular technologies that have a lot of very useful plugins when it comes to development such as "prettier" which is an extension that cleans up and auto sorts your code every time that you save it will even add any potential semi-colons and brought in some imports for me to solve a bug in the code before it could happen. In order to make use of the list of great extensions react and node have on offer I am using Visual Studio Code as my ide I have some experience with this ide and have found it very easy to work with and has become my go to its built in terminal and hefty list of available extensions really help along development. I was even able to get components to auto start classes for me by creating a class and typing "rfcp" it would create a basic layout of a react file with some data already inserted into the file for me it is a small tool, but it helps a lot when you are working on an application at the required scale for this type of application. A database is required for the storing and management of data as the application is going to have a log in page where users can create accounts and thanks to another API called AuthO be able to securely log in and use their google accounts to automatically log into the application. It would also be important to store this data as user data would save so that when they next logged into the application their basket would save and their user profile data would save. The application would have stripe implementation in order to create a seamless payment system that allows the user to checkout of the application in a more standardized manner unlike previous projects where a checkout system would be a button that would just log the information and display a text box stripe allows for the easy creation of a high quality checkout system allowing the user to pay with google pay

and their visa card and save their information securely. Another advantage of using AuthO and Stripe is that they are both external tools I do not worry about their data that is on stripe and authO to deal with when a user is sent back from AuthO I get provided with their details but from Stripe I only receive the next step of the process which is their order confirmation which begins the delivery system. This system can be updated on the owner of the items side and be shown on the users side they can say the item is out for delivery and that will update the users order information. Finally, I will use GitHub and Render for the creation of a CI / CD pipeline using GitHub in this way is perfect as GitHub provides many tools that make life a lot easier during the development cycle such as having different branches in order to test changes to the application without impacting the main branch. Also, thanks to GitHub it is possible to continuously deploy to render as once the project gets deployed to main in GitHub it automatically loads onto render to be deployed.

1.4. Structure

Provide a brief overview of the structure of the document and what is addressed in each section.

1.0 is the introduction to the brief where the project is introduced, and the background / motivation and technologies are explored in order to provide a better understanding of the thought behind the project and technology that has been used to execute that thought process. 2.0 is the System where the requirements of the application are specified such as the Functional Requirements and Use Case diagrams where the reader will be given a better understanding of the application as a whole and the functionality that it contains each use case will demonstrate a different tool being used in the application and explain all key functionality of the application from a user point of view. It will also discuss the data and user requirements the overall design and architecture of the application will also be discussed in this section the Implementation of the more interesting parts of the code will also be highlighted along with the highlights of the graphical user interface and the testing plan. 3.0 will discuss the strengths and weaknesses of the project and where it has fallen behind in terms of development and the approach that was taken highlighting what in the project is really good and what could have used improvements. And finally, 4.0 will cover the discussion of the future of the application and where it may go under future development.

2.0 System

2.1. Requirements

All requirements should be verifiable. For example, experienced controllers shall be able to use all the system functions after a total of two hours training. After this training, the average number of errors made by experienced users shall not exceed two per day. Thanks to how this project works I do not believe it would take long for training on this application and can be done in a two-hour timeframe. Thanks to the fact that the application functions like a lot of similar services with its log in page allowing users to sign in with google and a checkout page that takes payments similar to other applications most users have common interactions with it is a user-friendly service but there are some drawbacks. The application gives users the ability to create listings on the application this provides a form that they have to fill out. Users are able to provide a name, city, country, delivery Price and estimated Delivery Time along with filters and items to put on the item menu while also the ability to store an image and a QR code that generates automatically at the bottom of the screen to link to the created listing. There is hand holding in this section where it error checks the user and will not allow them to enter any blank boxes and forces the user to fill out all information, but I do believe there is room for error when interacting with this side of the application.

2.1.1. Functional Requirements

- 2.1.1.1. Use Case Diagram
- 2.1.1.2. Requirement 1 User Registration

2.1.1.3. Description & Priority

This requirement is necessary to allow the user to continue to interact with the service without having registered an account they are unable to interact with the majority of the service this requirement has been made easier to complete thanks to Auth0 as users can automatically sign in to the application with their google account all managed by auth0.

2.1.1.4. Requirement 2 Search Function

2.1.1.5. Description & Priority

Without the use of the search function the user is not able to do much apart from fill out their profile information and shop listing information but if you can search and view your shop lifting then it is pointless making the search function that allows the user to search for shop by city example putting in "Dublin" will load all the shop listings in Dublin this is what opens the application up to the user.

2.1.1.6. Requirement 3 Manage Shop

2.1.1.7. Description & Priority

This is the functionality that allows for listings to be created on the application it also is home to the orders screen where users can view the orders that are made on their listings and can interact with the delivery information for each order. The manage shop function is crucial to the populating of the application and is important as this is where the QR code functionality is to generate a QR code for the created listing by the user.

2.1.1.8. Requirement 4 Cart

2.1.1.9. Description & Priority

This functionality allows for the user to open the search screen and after searching for listings in Dublin they can click on a listing and view its store page after viewing its page

they can click on the item they wish to buy and it will be added to their cart before going to check out this page is what allows you to select your item view the filters on the item if it's a "shirt, jeans, shoes etc" and also view the Size listings that are made using the white shirt that is populated as an example. It also provides users with the knowledge of the delivery fee and the total price of the items in their basket.

2.1.1.10. Requirement 5 Stripe

2.1.1.11. Description & Priority

If it was not that this section comes at the end of the application it would be first or second place providing users with a seamless purchasing experience is important to making sure that the usability of the application is comfortable and familiar to the end user and this page is familiar it interacts like any other high tier checkout page providing the user to pay with their card information and also the ability to pay with google pay and link.

2.1.1.12. Use Case 1 User Registration

Scope

The scope of this use case is to allow the user to register an account with t he system and gain access to its functionality as all features are locked behind an account.

Description

User clicks Login button and is brought to login page where they have the ability to log in, register or sign in with google the login page that they are brought to is hosted by AuthO and the information they provide is first given to authO before being sent back to the application.

Use Case Diagram



Flow Description

User presses log in button and gets taken to auth0 where they fill in their log in details that are then sent to the system/administrator.

Precondition

User has connected to the application.

User presses log in button in navbar.

Activation

This use case starts when an actor clicks on the log in button in the navbar

Main flow

- 1. The user clicks log in button.
- 2. User is then sent to webpage hosted by auth0
- 3. User is presented options to "log in", "register" or sign in with google.
- 4. After user registers, signs in or signs in with google information is then sent to system.
- 5. User information is stored in database for future log ins

Alternate flow

User clicks log in button and closes the application not wanting to create an account.

Exceptional flow

E1 The web application crashes

- 1. The user looses internet connection
- 2. The render provider closes the server forcing user out.
- 3. Auth0 has technical difficulties

Termination

Terminates after the user gets sent back by authO after creating an account or linking their google account

Post condition

System sends the user back to the home page where they can now fully interact with the application having logged in.

2.1.1.13. Use Case 2 Search Function

Scope

The scope of this use case is to allow the user to search the application for listings depending on city so when the user searches "Dublin" it provides all the listings in the Dublin store.

Description

User clicks on search section and enters search parameters to be brought to next step of the application.

Use Case Diagram



Flow Description

User clicks on search bar and enters search parameters for "City" and gets sent to ./search/(city)

Precondition

User clicks search bar.

User enters search parameters.

User clicks Search or presses Enter.

User loads search page with entered city name.

Activation

User clicks search on the application bar to be brought to new page.

Main flow

- 6. The user clicks search bar.
- 7. The user enters search parameters.
- 8. User presses Enter.
- 9. User loads ./search/(city) page

Alternate flow

User clicks order status instead User clicks navbar in top right and goes to Manage Shop User clicks navbar in top right and goes to User Profile User logs out

Exceptional flow

- 4. The user looses internet connection
- 5. The render provider closes the server forcing user out.

Termination

Terminates when user clicks search button after having entered search parameters

Post condition

User loads the search/(city) page depending on what "city" the user entered

2.1.1.14. Use Case 3 Manage Shop

Scope

Create the shop listing and also view the order status of orders created from the users listing

Description

User clicks manage shop in the top right navbar after logging in.

Use Case Diagram



Flow Description

User clicks manage shop

Precondition

User hovers on nav bar

Drop down menu displays

User clicks Manage Shop

Activation

User clicks manage shop button

Main flow

- 10. The user hover over nav bar
- 11. The user clicks manage shop button
- 12. Page loads

Alternate flow

User exits system

Exceptional flow

- 6. The user looses internet connection
- 7. The render provider closes the server forcing user out.

Termination

Terminates when clicking manage shop button

Post condition

User updates or creates manage shop data

2.1.2. Data Requirements

Data requirements for this application involved the information that gets provided to the application after the user has logged in including their email address, system then allows the user to fill out personal information and then allows the user to enter shop information that is all stored in the

MongoDB database. Orders by users are also stored in the database stripe keeps users payment information separate to the application and is not stored in the database

2.1.3. User Requirements

Users need a valid email address in order to log into the system with auth0 or else they will not be let onto the system without first registering an account with auth0 or linking their google account also users require payment information in order to interact with the stripe payment system this payment information can include their debit cards or even using a system such as google pay

2.1.4. Environmental Requirements

The service is hosted a free server that is always running the impacts of this application are minimal but there are still some there is always a web service running on render and while it enters a low power mode when not in active use it is always running also MongoDB database is running and listening in on the system.

2.1.5. Usability Requirements

The usability requirements for this application is that users should be able to look at it and recognise a familiar layout as it has a familiar layout that is quite popular with web based applications such as a search bar and nav bar with log in buttons in the top right. Features also come into importance for useability such as Auth0 being used to manage log ins to make it easier for the end user and also stripe payment ensuring a smooth and painless payment experience. Erro handling is used and provides error messages when something goes wrong such as a page loading a 404 is displayed and other internal errors for when systems do not respond properly. As this service is hosted on a free tier of an application sometimes parts of it does not load due to it being a very slow server.

2.2. Design & Architecture

Important to know about the design and architecture of my application is that the frontend and backend are separated into two separate folders doing this made it easier to upload the application onto render while still being a very time consuming and difficult task as it provided no error messages to alert me where I was going wrong in the application I use shaden in order to important all my necessary UI features and import various APIs for the added functionality of the stripe and auth0 services I created .env files that store all of my important fields that would be needed for uploading the application onto render and also have the application laid out so that all "controllers" and "API" have their own folders so that if an issue occurs with an API request I know the issue will more than likely be in the "API" folder.

Ran out of time.

2.3. Implementation

Describe the main algorithms/classes/functions used in the code. Consider to show and explain interesting code snippets where appropriate.

Import pieces of code in the application are in both folders separated into "frontend" and "backend" with the backend handling the functionality of the server and MongoDB database the frontend included all of the API an example of interesting code is in the "MyShopApi.tsx" file where the create my shop functionality is stored

This code exports a function named useCreateMyShop and imports the getAccessTokenSilently from the useAuth0() the create my shop request is used to send a Post request to creaye a shop after acceptiong the argument shopFormData

The models folder in the backend application is responsible for populating the 3 tables of my MongoDB database providing it with all the necessary fields for each table stored in one folder for ease of use.

For the creation of important pages with lots of functionality I have given them a folder here is an example of the manage shop page and all the classes inside its folder



Types.ts is where all the variables that come from the database are converted into their respective string or number category before being grouped up by "User" or "MenuItem"



This makes the useable in the system and can be called from anywhere in the application making development an easier experience. Ran out of time.

2.4. Graphical User Interface (GUI)

Auth0 log in page:

\mathbf{Q}	
Welcome	
Log in to dev-u2jeirdju2nzy5rb to continue to frontend.	
• Email address*	
Password*	
Forgot password?	
Continue	
Don't have an account? Sign up	_
G Continue with Google	
5	

Orders section in manage shop

active orders				
Customer Name: Colm	Delivery address: Shangan, Dublin	Time: 15:43	Total Cost: £17.00	
1 Black Shirt				
What is the status of this order?				
Delivered				0

Manage Shop Details

Polite Bre defails alonal you	r Menge			
name				
Aidan Smith				
City		Cour	<i>try</i>	
Dužlin		in in	land	
Delivery price (ii)				
2				
Estimated Delivery Time	(Minuted)			
4				
Filters				
Life	District		Discussion	Domest
Converse-	O Vessel	O ALCONY	Linder Armor	Gyradwik Scott
Director	Disce	Tolar	Olymory	O Football
O Secto	O Linderwear	O Sham	O Here	Officiant
Gloves	O Ment	O Wanterie	0 68	O Other
finale par nena and gor Name	radi (me a name and a price Price (C)			
Black Shirt	16 E	ence		
	Below (/)			
Nanie	P10.P(0)			
Name Black Shorts	9	-		
Name Back Shots	4 C			
Nana- Black-Shorts Add Mena Item	(s)	ence		
Bade Shorts Add Mena Itera				
lane- Bok Prote Add New Inter	9 9 8			
itada Shota Add Mena Ibea Image	And a full section of the section of	ercen 15 Adam, som mage efferererie fore	ning and	
Narie Badi Shott Add Neric Deric Image	And the second s	ercor	ning and	
None Black Shots Add Ners Dark Image Inter a recyclical without		to dalay case may all constitution		
Norse Bod: Prots Add Mens Rets Image Interestinger Flat wither			Ning an	
None Bid: Shore Add Merce Iwen Image Malan reception will be i			Ning an	
None Block Shom Ast Ninco Sen Image Makes may have all for t				
None Biod (Port) Add Minor Iver Image Minor may free all for t		to Adam area may all armain the	ning an	
Norse Bilds (Prom Add Mines Inno Image Refer onception and the o	a and the second	is. Adap, area map of consists for	ning an	
Norse Bildel (Prom. Add Marce Tarres Image Ball or recept that and the s				
Norse Bilds (Dom) Add Mines Iwn Image Inter-rough their of the s				
Norse Black Shorn: Add Norse horn Image Million energy that will be t			Ning an	
Norse Black Shores Mit Ministe Surre Image Ball on recurr from out for				
None Bick (Prom Ast Ninco Ion Image Marco reception of the r	a a a a a a a a a a a a a a a a a a a			
Danse Bind (Prom) Add Menne here bit as many from add for a danse many from add for a	naryo a nature the blue of the contract and the blue of the blue of the contract and the blue of the blu			
Norse Inde Shore:	have go	to Adag a cost may all accretion from		
Norse Index Shores Index on once the late of the second se	have go	to Adap case may all const free		
Norse Inde Shore Inde Shore Image Inde a recept face all or Image Caces file No file d Caces	A set of the set of th			
Norse Back Prom	A			
None Back Shore Back Shore Cause File Han file A Cause File Han fi	A			

Search page:

commerce Clothes	s!	Ord	er Status (🛛	colmsmith 11@gmail.con
Filter By List Reset Filters Nike	Q Search by Shop Name			Reset Search
Adidas	3 Items found in Dublin Change Location			Sort by: Best match
Puma		Aidan Smith		
Under Arrmor Gymshark		Tshirt • Puma • Nike • Jordans • Sport	4 minutes Delivery fro	om £2.00
Converse				

Page for purchasing:

Aidan Smith Dublin, Ireland	Your Order	£17.00
Tshirt • Puma • Nike • Jordans • Sport	Delivery	£2.00
Black Shirt	Go to ch	eckout
£15.00		
Black Charte		

Stripe payment page:

ack Shirt	£15.
ıbtotal	£15.
hipping elivery	£2.
otal due	£17.

G Pay	Pay with	n ⊘ link
Or pa	y with card	
mail		
Card information		
1234 1234 1234 1234	VISA	()
MM / YY	CVC	0
Cardholder name		
Full name on card		
Country or region		
Ireland		~
Securely save my informa Pay faster on this site and ev	tion for 1-click ch erywhere Link is ac	eckout cepted.
∎ 📙 085 012 3456		Optional
⊘ link	More info	
	Pay	

Order status page:

Order Status: Awaiting Shop Confirmation

Expected by: 17:00

Delivering to: Niamh TEST UPDATED, TEST UPDATED. Your Order Small x 1 Total £19.00

2.5. Testing

Unfortunately, due to time restraints I could not perform accurate full testing as I would have liked I experienced technical difficulties with getting the application hosted and it took me days in order to get it up and running this was a massive blow to my development time and ate into the testing section of development. I did perform some Fuzzy Testing over the course of development but no unit tests in order to pull data from my tests involved me loading up the application and trying to break it and see where I could find errors. This has been the biggest blow to my development period as without the application deployed, I could not work on anything else as it was crucial for a web based application to be deployed. Got the application deployed in the end and fixed the bugs stopping the system from accessing the render server

Deploy failed for 88a015a: Test Exited with status 2 while building your code. Check your deploy logs for more information. May 11, 2024 at 10:56 PM

A deploy log from the render server to show it broken compared to the latest log showing it working.



Deploy live for 1383bb7: FinalCommit May 12, 2024 at 5:50 PM

This is the only tests I had time to carry out.

2.6. Evaluation

Unfortunately, I had technical difficulties in the final weeks of the project seriously impacting the development time but thankfully the only key feature that was impacted from the application was the statistics tab while the user can still view their shop details I wanted to have a separate tab where they could view their sales etc but sadly did not have time in order to create this functionality after resolving the other issues.

3.0 Conclusions

Describe the advantages/disadvantages, strengths and limitations of the project.

This project was a serious challenge working with so many different technologies creates errors where you don't expect then and does not create errors when you do having to learn how to interact with each system such as setting up Auth0 and setting up stripe while they both thankfully have lots of documentation to help in the process of setting them up it is still difficult to do it for the first time. What I have absolutely gained from creating this project is the ability to say I can do it again I can work with these technologies again I know how to integrate them and how to properly link them with other technologies for example allowing the render server to access the API requests of auth0 and imagery that was needed to load and display the pictures something as small as allowing the user to enter an image and save it to the database was a lot more work than I had planned for. The strengths of this project are its auth0 log in system that vets users before sending their information off to the MongoDB database where their details are then saved for future log ins, also the stripe payment management system is a massive strength as it really feels and looks professional where this project falls behind is the delivery I wanted to have this as a complete package but technical difficulties got in the way I really wanted to have that extra functionality that the statistics page would have added as I believe it would have made the manage shop section more functional and would have liken to show it off at the showcase day. A big strength is now my understanding of these technologies that I had little to no experience with and while the application is not going to be as good as my next or the one after it is a good starting point into the creation of bigger scale web based applications.

4.0 Further Development or Research

I would make the service prioritize more than clothes and would add the statistics page of the application so users can view the important information regarding their products also I would like to allow the application to allow a user to sell more than 1 item at a time as this limits the feel of scale I would like from the application.

5.0 Appendices

This section should contain information that is supplementary to the main body of the report.

5.1. Project Proposal

National College of Ireland

Project Proposal Web Application 28/10/2023

BSHCSD4

Software Development

2023/2024

Aidan Smith

21105774

x21105774@student.ncirl.ie

Contents

Objectives	. 2
Background	. 2
State of the Art	. 2
Technical Approach	. 2
Technical Details	. 2
	Objectives Background State of the Art Technical Approach Technical Details

6.0	Special Resources Required	2
7.0	Project Plan	2
8.0	Testing	2

1.0 Objectives

This project sets out to create a web-based application that allows users to order and view menus in restaurants using QR codes. The application will enable users to scan QR codes placed on tables inside restaurants, which will take them to the restaurant's digital menu. Users can then place their order directly from their phone without the need for a physical menu or server. The application will also allow users to view the menu items and prices before placing their orders. The goal to be achieved by this project is to provide a more efficient and convenient way to order in restaurants while also reducing the need for

physical menus and waiting for a server to be able to take your order. There are more possible routes that can be taken with this project one such example is a clothing shop that uses QR codes on the tags of their clothes that customers can scan to view all the inventory of that item of clothing that is in stock in the business allowing users to see all the stock for the clothing without needing to ask a staff member if they have more in the back of the shop.

2.0 Background

I have chosen to undertake this project as it is a project that can be implemented and used in everyday life by various different types of storefronts. The creation of an application I can see being used regularly by users in a real environment is of great interest to me. I believe that by allowing the customer a simple way to interact with the restaurant without the need of an employee helps to make the experience more efficient and more convenient for both customer and restaurant. To meet the objectives that were set out in section one I will need to create a web-based application that allows users to order and view menus in restaurants using QR codes. I will also need to ensure that the application is secure and reliable. I will need to ensure that this application is accessible on android and los and make sure the site is displayed properly on phones, tablets and laptops. Regular testing of the application will need to be done in order to ensure that all services are working as intended and fully functional for use.

3.0 State of the Art

There are other applications that currently exist that do what this application is setting out to do such as MyDigiMenu and Orderable are two of the most popular. My project stands out as I would also like to create the clothing side of the application that allows for clothes to have QR codes on their clothes tags that can be scanned in order to view the rest of the inventory that is currently in stock for that item. Ideally I would like this application to be able to hold multiple different stores so possibly the ability for business to sign up and have the ability to go through and create their own listings for their business and generate their own QR codes on the application making it so this application can be a tool used by businesses to personalise the approach for each of their stores. I would also like for the application to generate data that the businesses can view such as which menu item is most popular and which items are most visited by users.

4.0 Technical Approach

I plan on taking a structured approach in order to develop this application. This will involve sitting down and analysing every aspect of what is currently planned for the applications end product and break it down into the How. How will I create the website? How will I store data for the businesses to view? How will I test the application? I will have to outline the problems that I want this project to solve and define the solutions to these problems. Then after defining these solutions I will have to break them down into smaller tasks in order to

make them more manageable and simpler. I also plan on making a scrum board after breaking down these tasks. Using a scrum board with easier to follow tasks will make the development of the project simpler as I will have clear goals and steps to take. I plan on creating a project plan that will include the milestones that I want this project to achieve in order for the project to be completed. With a project plan as I'm working through my scum board of tasks I have to complete I will have clear milestones to work towards and use as a benchmark for my progress towards project completion. Regular testing will be needed in order to make sure that all created features are working as intended and reach my requirements for the project.

5.0 Technical Details

The programming languages that are currently being considered for the creation of this application are HTML, CSS and JavaScript in order to create the web based application to do this I am planning on using the React and Node frameworks that use Javascript for the frontend and backend of the application this framework will allow for the application to be more efficient as react and node provide better speed and performance than a regular application. For the use of QR codes I plan on using something like grcode.js but as I have not used this or looked into it too much yet there could be better alternatives for me to use for the application. I may also need to use a database management tool which could include either mysql or mongoDB while I have worked with databases in the past. I will still need to look into these options and decide which is better for this project. I plan for this application to have payment functionality which will require payment gateway integration such as Stripe and Paypal. For security I will need to ensure that the application is secure by implementing security measures such as encryption, authentication, and authorization. For the launching of this application regular testing will be required throughout the development of this application this can be done using a tool such as Jest but will require more research to ensure the best option for testing is used.

For the important algorithms this will still require research as I will require algorithms for the security of the applications payment authorization. This still requires further research and discussion.

6.0 Special Resources Required

No special resources should be required for the creation of this application.

7.0 Project Plan

Current project plan is a loose plan for the project currently as I am planning on discussion with supervisor my plan for this application so the current timeframe for all sections is just

going to say "1 week" until I have sat down and can come back with a much more detailed project plan that will include the specifics of what is actually going to go into this application.

Select programming languages and frameworks that will be used for the creation of the project in order to begin this should be completed as soon as possible so that development can begin. 1 week.

Research the basics of QRcode scanning and integrate a library that will allow the application to read QRcodes and assign them to the website so that they can be created, stored and used throughout the application.1 week.

Design the user interface before development in order to get a good grasp on how the end product is going to look in order to help make the application look as nice as possible and make sure the service is as user friendly as possible. 1 week.

Begin creation of the scrum board that will hold all the small tasks that will need to be completed in order to complete the application and will include a timeframe for feature completion and feature testing. 1 week.

Project testing plan in order to ensure that all features follow regular testing and will use a testing tool such as jest in order to efficiently test all features of the project. 1 week.

Database development in order to store and manage user data and integrate it into the application so that users can view necessary information such as most popular items and most visited items. 1 week.

Server hosting in order to host the website. A reliable server provider will need to be found in order to ensure minimal downtime of the application. 1 week.

Publish completed application after regular testing and the service is fully feature complete. This will be done at the very end of the development cycle after all other tasks are complete.

8.0 Testing

In order to test this application I will have to use many different types of tests to ensure that the service functions as intended these tests include.

Unit Testing in order to test the individual components of the system these tests can be automated and completed quickly.

Integration Testing will be used to monitor how different components of the system work together and can help find problems when two systems are conflicting with each other.

Performance Testing will be used to monitor how the system performs under different loads and conditions and will help with finding bottlenecks in the system.

For testing with the end user I am going to use usability testing to monitor how easy it is for end users to interact with the system this will help identify issues with the user interface and other aspects of the system.

With ethics in mind before conducting any user testing I will need to obtain informed consent from users and ensure that privacy is protected.

5.2. Reflective Journals

October:

Supervision & Reflection Template

Student Name	Aidan Smith
Student Number	21105774
Course	BSHCSD4
Supervisor	Frances Sheridan

Month: October

What?

This month I worked on coming up with my project pitch which I have submitted. I thought up a project that I would find interesting to work on and also frequently checked past projects in order to help me along with forming my idea for the project then after I received feedback for my pitch I began writing my project proposal which would go into much more detail on what I've currently planned for my project.

So What?

Having completed the project pitch video I have now gotten my project approved with some changes needed to be made and have created my project proposal which describes my current plan for the project as it is still early this is only a first draft to receive feedback and continue to plan out more of what I need for completing this project.

Now What?

Now I am going to schedule a time to talk with my supervisor in order to receive feedback on my project and further explain my project in order to receive feedback and be helped with getting a better understanding on what my project still needs in order to be completed I will also be beginning planning out the project by breaking down the functionality and creating a basic scrum board for the start in order to help me begin development of first draft of the project.

Student Signature	Aidan Smith

November:

Supervision & Reflection Template

Student Name	Aidan Smith
Student Number	21105774
Course	BSHCSD4
Supervisor	Frances Sheridan

Month:

What?

Throughout this month me and my supervisor arranged a set time to have regular meetings to ensure constant communication to help with the progression of my progress. Every Wednesday at 9:40 I meet with my supervisor to discuss my project in these discussions so far the project has changed slightly to only focus on the inventory management for shops with QR codes so a user can walk into a shop view one of every item and then scan the item to purchase it from the shop also the shop owner will be able to view the analytics of each item being purchased to view data on sales and other important information this has all been decided this month and will be updated on my project proposal.

So What?

Being able to have regular meetings to discuss the progress on my project has resulted in steady progress and the settling on the final concept that I am going to work with to complete the project. Having settled on the project has resulted in having clear goals what I have to do in order to complete it to a good standard and also discussing what will be done for the submission in December.

Now What?

What can you do to address outstanding challenges?

Now I must begin developing the prototype for the project this is going to be a bare bone take on it that will not include all of the features of UI elements but will have the basic functionality in order to give a general idea of what this project is about. Then I must work on creating the project proposal document for the December submission to explain in detail exactly what tools and specify what will be completed for the final product.

Student Signature	Aidan Smith

January:

Supervision & Reflection Template

Student Name	Aidan Smith
Student Number	21105774
Course	BSHCSD4
Supervisor	Frances Sheridan

Month:

What?

This month at the beginning of college starting back up after the break I spent my time reviewing my documentation that I have submitted for my prototype in order to view where I currently am by viewing what I have already completed and what is still to be completed for the course.

So What?

For the progress of my project this means I now have a clear understanding of where I am currently sitting when it comes to the progress of my project and what is still to be completed for the project. This has helped with providing clear goals in order to properly progress the creation of my project over the coming semester.

Now What?

To address these challenges I have to begin adding the necessary features that are still necessary for the application to function as it is planned. Also need to work on creating a better user interface than what was provided for the projects prototype as I am not happy with it and does not follow my end goal for the project.

Student Signature	Aidan Smith
-	

April:

Supervision & Reflection Template

Student Name	Aidan Smith
Student Number	21105774
Course	BSHCSD4
Supervisor	Frances Sheridan

Month: April

What?

Previously I have spent the past months of February and March primarily working on my other two modules as all my deadlines for these modules were spread throughout the past two months since completing all projects for my other classes I can now fully prioritise and work on my end of year project. I have a good baseline created from my prototype but still a lot to do which I have been working on this month.

So What?

So now that I have completed all other requirements I can fully prioritise work on this project and have made good progress in the month of April on this project building on from my prototype that had been created I now have clear goals in mind of what is still needed to be created for the completion of my project.

Now What?

Now to address the work that is still required of my project I started off by making a list of what is still needed for project completion this list includes the implementation of a MongoDB database to the project and the implementation of a login screen which allows for guest login and admin login each having a different view of the overall application. Guest users should be able to view the application and browse the web application like they would any web store but also this application has an in person use where they can scan a QR code on a item they wish to purchase and view how much stock of the item the shop has left for example shopping for clothes and scanning a white jumpers QR code to see if there is stock of the item in the users size. While admin view should also be able to view the stock level but also a statistics tab that shows a line graph of how much of each item has been sold. Also, a checkout page is necessary that will allow the users to purchase the items from the web page.

Student Signature	Aidan Smith