

**BSc (Hons) Computing Science**

Development project of a website prototype using an integrated SQL database system.

**Computing Honours Project (COMP10034)**

**Interim Report**

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**26/11/2021**

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# Chapter 1 - Introduction

## About the Project

This project will be centred around a prototype of website, this website will be designed and specified for a hypothetical online marketplace business. The prototype will be created using Microsoft visual studio and will be connected to a SQL database that will drive the website containing the information of the stock of products, orders, staff and suppliers and have of the appropriate relationships setup. The prototype will not be a fully realised website it will show key functionality of website navigation and database relations. In the report the researcher will go further into what makes good design and a good user experience of a website. Upon completion of the prototype a small-scale study of some end users will be undertaken to get feedback and create analysis of some key features of the websites design and functionality.

## 1.2 Project Aim’s and Objectives

The project will have three main objectives that will be achieved. This section will explain these objectives and how they will be accomplished to aid the project and ensure it is fully functional as well as athletically pleasing. These objectives are:

### 1.2.1 To create a website prototype that integrates an SQL database

The first objective is all about a working prototype to do this it must be a working website with fully fledged pages and navigation between them which will be created through visual studio code using languages such as C++ and C#. the Project will be further achieved this by being Stylised through CSS style sheets and Integrating a working SQL database that allows connection between the website and the database and analyse the choices made throughout and reflect on what was done well and what could be done differently.

### 1.2.2 To create website designs and analyse what makes good design

The second objective which will be creating layout designs of where elements on the screen (wireframes) will go and the best visually appearing colour scheme using the software figma. These layouts will then be analysed to discover what elements of a websites design and architecture users find the easiest to navigate and create the best user experience.

### 1.2.3 To judge the effectiveness and design of the website through a focus group of individuals

The third objective will be creating a survey for a group of potential end users, with the aim to complete and to analyse the result to find what was effective and what was not in regard to how users navigate. For example Is it visually appealing, does it work as they believed it would do etc.

# Chapter 2 – Literature Review / Background Study

This project will by no means be revolutionary there are many examples of stock taking websites that allow the sales of goods and tracking of orders out there. Some of the biggest examples of this include the familiar likes of the corporate giants Amazon and eBay. This project will differ in the fact that it will be small-scale and easily modifiable to suit a small business, a simple design and architecture allows for a business such as this to change the website with relative ease over time to suit their needs as they evolve. Whereas ultra-complex setups require entire teams of staff to maintain and update.

This project prototype will streamline some of the features that well known examples of this kind of website include for example many of the large websites like very, Argos etc. have a large hierarchy of categories to shop from with sub-categories within categories such as “Technology > Televisions > TV Ariels” as an example of a route that can be seen on Argos’ website. This project will only contain a few categories as within the prototype there will not be enough products to warrant multiple levels of categories. When viewing products an industry staple is to show the products in list form with details about the product accompanied with a photograph of the product. This project will also show the products with details however there will be no picture along that is a potential feature that could be added down the line. If a user has made an order on any of these kinds of websites there is most likely a feature to view your order details with such information as what was ordered, how many of those items were ordered and a unique order number some of the websites that offer this feature include Amazon, Adidas and eBay. This project will also include a “View Order” feature allowing users the ability to review orders that have been made.

This review will access the components that will make the project possible along with a review and comparison of websites of a similar nature. There will be multiple sub-sections representing each aspect of what make this project.

## 2.1 Visual studio code

This project will be created using the Microsoft visual studio code (VS Code) software, it is an excellent example of a source code editor that will be used to create all the code needed for the website prototype, softwaretestinghelp.com rate as the 5th best source code editor on the market (Top 15 Best Free Code Editors For Perfect Coding Experience, 2021). This software provides a lot of pro’s that will smooth out the development process of the project such as having an auto completion feature that encompasses function definitions, imported modules by the user and variable types allowing more time to be spent on the coding itself. It is also able to provide debugging with the use of breakpoints and an easy-to-use interactive console. VS Code also does not take up much memory space in RAM giving a smooth user experience, VS code is however known to run slow on Linux systems however for this project it will be created on a mac system so this downfall can be Ignored in this case.

## 2.2 Languages

### 2.2.1 - C#

C# will be the language used to create a large portion of the website code that enables it to viewed online. It is an object-oriented language and is a popular pick in creating web-based applications such as this project as while it is easy to learn is complex offering up a lot more that can be done with compared to some other languages leading it to by the 4th most popular developing language with 31% of developers using it “regularly” as described by Armina Mkhitaryan (Mkhitaryan, 2021). C# also allows for the MVC design pattern to be used (Model, View, Controllers) it allows the separation of these entities into separate pages which can greatly shorten development time with a streamlined architecture.

### 2.2.2 – Cascading Style Sheets (CSS)

Cascading Style Sheets are used in web development to separate the content HTML code from the style HTML code helping to avoid duplication of tags and shorten time spend styling and designing the website by not requiring to individually style every single page and will be used with this project to bring the physical appearance of the website to be the same as the wireframe and high-fidelity designs.

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### 2.2.3 – Structured Query Language (SQL)

SQL is used widely to manage data within a database allowing for manipulation of entries via query statements. In this project SQL will be used to add, edit and delete details on orders, Stock Levels, Suppliers etc.

### 2.2.4 – HTML (HyperText Markup Language)

HTML is used worldwide to describe the structure of all webpages such as the content of the webpage, Text, Headings, Photos etc. In this project HTML will be used to create the webpages for the website along with previously mentioned CSS to style the pages.

## 2.3- SQLiteStudio

SQLite is a desktop tool created by software engineer Pawel Salawa used to edit and modify databases specifically SQLite database files. SQLite is also a free and open-source program which is excellent in keeping development costs down. This software also provides the advantage of not requiring a server, a lot of relational database engines are server processes in which the programmes have to communicate online with a host server. However, SQLite any processes that need access to the database can just alter the database disk file directly instead.

# Chapter 3 – Preliminary Work

## 3.1 User Requirements

There are some requirements of functionality the website will aim to achieve. It is important to have clear aims and user requirements in a project, according to Mark Kraeling and Lindsley Tania “Even though user requirements may lack specifics on what really needs to occur in the system, they are still valuable in that they can provide the overarching system functionality expectations.” (Oshana and Kraeling, 2019).

For this particular website key user requirements include

* The website must have a consistent design throughout
* The ability to easily navigate throughout the website
* To be able to search for particular items
* To be able to view products within a specific category
* Can see all information about a product in an easily readable format
* Being able to make orders on items found on the website

As development of the project continues more requirements will be added and changed, In the preliminary phase however these are the basic functions that have been identified.

## 3.2 Initial Design

Diagram, shape, polygon

Description automatically generated

The as yet undecided name of the company will be large and in the centre of website with two small images will be either side the left will be an image of the logo for the company that will also be a secondary link back to the homepage from any other page, The image on the right will be a basket with a link for customers to be able to buy items through, This location was chosen for this project as many websites such as Amazon, Very and many others have their basket located here providing some familiarity for the user as it has become the standard for the industry. There will be a navigation bar fixed in the same position throughout the website to increase consistency and creating a better flow through the website. The Navigation bar will include shortcuts to what will be the five main pages, The Home page which this initial design is showing, the search page which will allow the user to search for the desired product while also allowing for sorting of results in the following options.

* Price High to Low
* Price Low to High
* Highest Rating
* Newest

The categories page will show a list of all the categories that can be selected to show only products of that category, all products will only be assigned to one category. Orders page will allow customers to review details about any orders that they have made and are currently waiting on and any other orders that have previously been completed. Finally, an about us page which will include info about the company and some ethics and privacy info as well.

The initial design of the website is an overall minimalist design with not too many elements as to intimidate a new user making them leave the website. There will be none/ very little bodies of text present on the website as to bring the focus and attention of the user to the products themselves with a majority percentage of the main home page allocated to showing the most popular products that are sold. The large text on the webpage provides good readability along with the minimal elements provides a simple clean aesthetic which is desired for having many benefits according to Neil Patel which include simple design being “Timeless”, “More accessible”, “Easier to build and fix” (Patel, 2021).

# Chapter 4 – Progress and Future Planned Work

## 4.1 - Method of Management

This project has been planned around a Gantt chart that details all the steps of the project and key milestones and dates. There is one Gantt that serves all markers over both trimesters shown below in 4 sections

A screenshot of a computer

Description automatically generated with medium confidenceInterim (2nd Oct – 6th Nov)

A screenshot of a computer

Description automatically generated with medium confidenceInterim (6th Nov – 4th Dec)

A screenshot of a computer

Description automatically generated with medium confidenceFinal Project (6th Nov – 18th Dec)

A screenshot of a computer

Description automatically generated with medium confidenceFinal Project (18th Dec – 24th Jan)

The Gantt chart allows for flexibility in planning as well as if circumstances change or problems arise in the development process then time allocations can be changed, and new tasks can be added in as well. The way this project as been planned would reflect the agile method of planning as the project as a whole has been planned for adding in clear aims and specifications that the final prototype must align with. With the agile method the whole project can be flexible, and the final product can be changed if needed to suit problems that come up or scale up/down with time restrictions etc.

## 4.2 – Problems

There have been some problems to overcome so far in the process such as a late start due to lack of direction and not knowing whether to take the project down a traditional writeup route or a more developmental one. The balancing of work, personal and university life has come with its challenges and pressures, unexpected events happening delaying the project and such however this has factored into the development style chosen giving as much flexibility as possible to help meet deadlines on time.

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