

King's College London Mathematics School

King's Certificate

ONLINE SHOPPING EXPERIENCE

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Cover image: (1)

Abstract

The project brief (2) instructs us to evaluate and redesign the shopping process of a common supermarket online store. This article comprises of research surrounding such UX design and our attempt at creating a website which thoroughly integrates the results of this research to optimise every user's online grocery shopping experience.

Introduction

The Team

We are three keen GCSE Computer Scientists who have resumed our passion for the subject at the Advanced Subsidiary Level, all of us with significant design experience.

Together, we have combined fluency with the following programming languages:

- Python
- C++ *and*
- C#.

In addition, we have some experience in the following programming languages:

- XAML (through the use of Xamarin.Forms)
- XML (through the use of Xamarin.Android)
- SwiftUI (through the use of Xamarin.iOS)
- HTML
- JavaScript
- CSS *and*
- QML (through the use of Qt).

In addition, R. Butrus and J. Halai have extensive website design experience, including through the use of Wix and ASP.NET Core to create a number of websites for commercial institutions. R. Mohammad is experienced in front-end development and user interaction. Furthermore, R. Butrus is experienced in mobile app development, particularly through the use of the .NET framework.

The Project

In the last decade, shopping has shifted to an online basis on a great scale and has become a key part of modern lifestyle. It is critical that the online shopping experience is made as efficient, convenient and pleasant as possible. In addition, online shopping has a range of environmental benefits, including the reduction of greenhouse emissions caused by travelling shoppers. With many millions of the UK's population shopping online, there is an increasing demand for an improved interface. Moreover, it is now more pressing than ever to limit social contact in order to reduce the spread of COVID-19 – and we believe that by contributing to the successful digitalisation of shopping, we are contributing to the national effort to save lives at this delicate time.

It is clear that different societal groups have different technical abilities – some more able to use online shopping facilities than others. For example, senior citizens who may have had less exposure to technology throughout their lifetime will be less able to use a typical online shopping website than a university student under the age of twenty-five years. This reinforces the importance of clear and easy-to-use user interface design.

Our task is to evaluate the current online shopping experience and thereby redesign the online shopping experience to provide a meaningful and appropriate interface for users (2). This is composed of three subtasks:

- **Research:** In order to create and deliver the most effective designs, we are required to evaluate existing websites by analysing their use of website design tools. For example, we have closely analysed GOV.UK (3) (the website of the Government of the United Kingdom) with regards to the Government Digital Service's use of colour, shapes and simplicity to ensure an optimal user experience. In addition, we research: the (general) psychology behind UX design; the meaningful and effective use of landing pages; search and browsing mechanisms; customer centricity and personalisation and the need to deliver a device-responsive design to guarantee ease of use.
- **Design:** Following scrupulous research, our attention shifts to reviewing the essentials of website design and thoroughly incorporating this into our online shopping website designs. This stage is purely design-orientated, throughout which there is a continuous iteration through design, evaluation and redesign until we reach an optimal design which is traced to perfection and realised in the next stage.
- **Prototype creation:** We have decided to pursue the extension task, which is to produce a prototype for our design(s) using Figma, a web-based vector graphics editor and prototyping tool. This prototype is limited to a semi-functional online grocery shopping website which allows users to register, sign in and add items to their virtual trolley. We do not deem it necessary to produce a secure payment system or a delivery/distribution arrangement system.

It is our intention to ensure adequate levels of testing are in place throughout the design and prototype creation sections of this task to ensure the fixation of all identifiable bugs prior to finalisation. Furthermore, we believe it is essential to execute appropriate consumer product testing (where appropriate and possible) to ensure the final product has been thoroughly interrogated.

Literature Review

Online grocery shopping has become increasingly popular amongst the population, especially in the last year in light of the COVID-19 pandemic. Many key grocery shops, such as Amazon Fresh, Morrisons, Asda, Tesco and Sainsburys, have worked on improving their online shopping designs to ensure users can still shop for their essentials despite limited access to physical supermarkets. We decided to focus our preliminary research on UX design methods, including but not limited to: website components, landing pages, search mechanisms and browsing mechanisms.

First of all, we decided to look at what a typical user expects from a website. An article on the '*Change in User Expectations*', written by Kim Salazar and Anna Kaley, who are both User Experience Specialists for the Nielsen Norman Group and have years of experience in the field of user interface architecture, analyses how the expectations of online shoppers have drastically changed in the past few years (4). Beginning their research of e-commerce websites in the year 2000, the authors have seen that users expect fast shipping and quick purchasing, alongside '*seamless transitions between stores and the web*'. In the article, aimed towards new UI designers and current website creators, they demonstrate how large companies, namely Alibaba and Amazon, have influenced users into expecting more of online shops overall, causing smaller websites to match the competitive standards of the large e-commerce platforms. They have used their research and have created six major themes of change: convenience, speed, assurance, accuracy, options and experience. We can use the guidance of what users expect in each of these themes, to enhance the prototype for our online shop, as we can pick out the user expectations and integrate them into our designs. However, we cannot ignore several limitations that are evident in this article. As this was written in 2018, their advice doesn't consider the changes that occurred due to COVID-19, as this has had a huge effect on supermarkets and added more pressure to e-commerce websites. This means we must question the relevancy of each part of the authors' research because, although most of it will remain the same, such as convenience and speed, options will be limited due to COVID-19, which will be reflected in changes of user expectations in this sector. To evaluate the relevancy of this article, we can compare it to an article written during COVID-19, by Suzin Wold on '*How COVID-19 has changed shopper behaviour*'(5). When looking at both articles, we can see that online shoppers still partially have the same basic expectations of websites, with the only exception being an increased worriedness about price, considering shortages of finances due to redundancy and other economic implications. To conclude, we can implement some of the research and advice given by the authors but must make sure they are conforming with the changes of user behaviour due to COVID-19.

In line with our research plan, we thought that our next article to review should be about the psychology of UX design, specifically the use and effect of different shapes in our designs. Medium's article on '*Shape Psychology*' identifies the influences behind the structure of an object within a UX design and its impact on users. Additionally the author, Kelsey Velemirovich, analyses how the use of a certain shape gives this affect by elaborating on the design of the shape and the impressions it is associated with. For instance, a square has

connotations of control, which is why squares are commonly used in the landing pages of shopping websites to display deals, items etcetera. Velemirovich is an aspiring UX designer and recent graduate receiving her Bachelor's degree in May 2020. Despite her relatively young age within the professional field, Velemirovich has an impressive portfolio commemorating her work in the field of UX design already showing that she understands the industry, making her a reliable source. The target audience in this article are aimed at beginners of UX design, by containing simple language and diagrams to complement the explanations for further understanding. Therefore, the article is very useful for the purpose of the project since we have relatively limited experience in UX design. Moreover, this article is limited to basic knowledge of shapes and will therefore be of little help to more advanced user interface designers. However, this may not be seen as a limitation for our research since we are not intending to use shapes in such a complex manner. Overall, the article will undoubtedly be referred to multiple times throughout the project since it forms part of the basis of our extension task.

Next, we decided to look at arguably the most important part of a website: the landing page. This is where a user 'lands' into the site upon arrival. In his article (6), Paul Boag, an experienced UX designer who has worked with brands such as PUMA, provides his advice on creating an effective landing page. With the main audience being UX designers or avid website creators, he mentions that the core purpose of a landing page is to influence the user into purchasing the promoted product and evaluates how this goal is achieved within a variety of design techniques. This is very similar to the message portrayed in Megan Marrs' article (7), "*21 Great Landing Page Examples*", where she advises designers to focus on converging a user towards a sale in several ways. Boag mentions that the user subconsciously asks questions about a website, which can be answered in the landing page in the form of a 'visual hierarchy'. The author's guidance about how the psychological aspects and requirements from a user affect the type of landing page that should be created, is very useful for our research as we can evaluate what the typical online shopping customer would want to be greeted with when 'landing' on a website and using this information to create a compelling landing page that is specific to the topic of 'online shopping'. However, there are some limitations, as this article constantly refers to corporate websites, such as Apple. This may mean that the information given with respect to 'value propositions' will not apply to our online shopping website design as it acts more as a gateway to products from many companies, rather than promoting the products of one brand.

Once a user has reached the landing page, the most predictable first action would be to search for an item. As such, we explored a selection of resources based on search mechanisms. In his online blog (8), Zohar Gilad describes the frequent mistakes of searching mechanisms in e-commerce websites and suggests possible solutions as well as advice in order to produce a successful site searching tool. One example used was the concept that most UX designers overlook the importance of the search bar on mobile devices. Gilad used the counter argument that searching is what a mobile user would be reliant on because browsing abilities are limited due to the screen size. Gilad is an American-based technology entrepreneur and co-founder of companies such as InstantSearch+, Cloud Power LLC and Fast Simon Inc. In addition, with a BSc in Computer Science and MBA from INSEAD, France, there is no doubt Gilad has a very rich experience in the technological industry. Therefore, the author is a source of reliable

information. On the other hand, one limitation of the blog is that the author does not use case studies to reinforce the problems linked with having a bad search mechanism. This in turn could prevent readers from knowing what to avoid while producing an e-commerce search tool. This blog will be a key part of our project since it will build upon the basis of an entire section (i.e. the search mechanisms section), and therefore will be extremely useful. Overall, the blog provides key information on what you must avoid as well as things you must consider keeping in the search tool of an e-commerce website, and since we are making a shopping UX design, there is no doubt that Gilad's work will be referenced with great detail throughout the production of the search bar.

Another way of 'searching' for an item is to browse the store. While this would be as simple as walking around in a physical store, the process becomes much more complicated if we were to implement this movement virtually through the use of a 'virtual shop'. Possibly one of the best-known examples of a virtual shop, INABUGGY's online shopping implementation, forms the foundation of our preliminary design ideas. It uses images taken using 360° cameras throughout a physical store and buttons for each product or category for a user to virtually go around the store and pick up their desired items. This approach has been implemented for several of their stores throughout Canada and has proven successful. Matterport, a leading data company, designed and built this implementation. They have an impressive portfolio and have implemented their designs in large companies, such as Gilbane, in over 130 countries throughout the world. It is thereby reasonable to assume their systems are reliable and that our designs, particularly the 'virtual shop' design, are not impossible or grossly impractical to implement. We have decided to research this type of online shopping design, given that there is a live operating exemplar to analyse and evaluate. There are some limitations to this implementation, such as certain features not working in full-screen mode and the impracticalities of using VR considering the proportion of shoppers who have access to the required equipment. However, such limitations provide us with an insight as to the types of problems we need to overcome in our design. Our design will be positively influenced by this implementation, although we aim to look at other online shopping user interfaces and ensure we thoroughly assess each of them.

Ultimately, we can conclude that there is a significant amount of researchable content surrounding UX design psychology and methods. However, these methods will not all directly apply to our project as many of them are more focused on branding rather than ease of use, simplicity and functionality. Additionally, in the context of online grocery shopping, there is very limited guidance for this particular market since there are fewer grocery shops than hardware shops, for example. Despite this, many of these methods can still be used to influence our designs and prototype, including Matterport's implementation of the virtual shop. As part of the above research, we have gained substantial knowledge surrounding our project. Firstly, we are now aware that we must shape our designs to ensure optimal convenience, speed, assurance, accuracy, experience and a range of appropriate options. Secondly, we learnt from Velemirovich in his article (6) that different shapes have different applications in website design, and that each shape implicitly conveys a different mood or atmosphere. For example, squares are generally used for controls and displaying information in a concise manner. Next, we looked at landing pages and the importance of manipulating a website's design to accommodate the predictable behaviour of the typical user. Finally, we learnt that

there are a variety of methods used to implement a working searching tool. For example, we came across the cruciality of having an emphasised search bar on mobile devices due to the limitations of screen size with respect to browsing methods. Similarly, there are multiple browsing mechanisms, mainly categorised into navigation and 'virtual shops'. It has become clear that the latter is more difficult to implement but more realistic while the former is easier to implement but lacks the physical shopping experience. In conclusion, we believe this preliminary research has proven fundamental to the project brief and our understanding of UX design and how we can implement this in our assignment.

Planning and Methodology

With our world being ever-increasingly digitalised, combined with the fact that more than half of the UK's population is shopping online, there is an increasing demand for an improved online shopping interface.

We are aware that society is composed of a range of groups of people, some less able to physically shop with others, either due to physical disabilities or travel difficulties. This project aims to make online shopping more accessible for all people, especially those who rely on the process to ensure food reaches the table. As detailed in the **Literature Review**, one key idea which we intend to implement is one of 'virtual shops', where online shoppers can swiftly navigate through the aisles to reach their desired products and add them to their basket. Another key concept is to ensure a user-oriented approach is adopted to maintain a sense of familiarity for the user.

Our research plan was constructed on the basis of preliminary research around UX design. It appeared that the most central aspect of UX design is the psychology behind it, i.e. knowing which shapes and colours users are drawn to when using a website (9). This involves creating a colour palette for the website which is used throughout it to maintain a uniform aesthetic. Furthermore, we discovered the importance of firstly, having a ‘compelling’ landing page – i.e. one that evokes interest and gains the attention of the user – and secondly, having multiple landing pages to add variety to a user’s overall experience of using your website (6). We also explored value prepositions – this is a brief explanation (usually a sentence or two) to depict what the company in question has to offer in a ‘concise’ and ‘compelling’ manner. For example, **Figure 1** shows Apple UK’s landing page (10) (as of 24 November 2020):



Figure 1

It is worth noting that Apple changes their landing page on a regular basis in collaboration with its new product releases, events and offers. We also noted the success of simultaneously having different landing pages and displaying the most appropriate landing page to welcome the user.

In order to develop the most successful prototype possible as an outcome of this project, it is paramount that we consider the following research points to guarantee a positive outcome:

- **Psychology:** Which colours convey certain moods? How can colour be used to represent the values of a company? Why do triangles create a sense of warning? How is a simpler design more effective at communicating a message? All of these psychological factors must be considered when designing our prototype to ensure the website is as successful as possible.
- **Page content:** What is a good landing page composed of? How should the page be laid out? What goes in the header? What should stay fixed on the page when the user scrolls down? What should a product page look like? It is imperative that the designers of a website carefully select the content which is used on the site based on the significance of such content.
- **Search/browsing mechanisms:** Crucially, it must be relatively easy and simple for a user to find the product they are looking for. For example, if a user types “flour” it is an obvious expectation for the search to return a list of flour products in order of relevance (which may include popularity) or price. However, if a user types “mik” the search mechanism should flag a spelling error and make an appropriate suggestion to

the user, such as *Did you mean "milk"*? Furthermore, we intend to evaluate different browsing mechanisms in order to decide which browsing approach we will adopt. We intend to implement a 'virtual shop' concept in which users can navigate through aisles just as they would in a physical store as a method to find the items they desire and add them to their trolley. There will be limits as to how realistic this approach would be, therefore it will be the research behind this that will influence how we decide to implement this idea.

- **Customer centricity:** As mentioned above, we intend to adopt a user-tailored approach such that the content of a given webpage is generated based on the preferences of the user. These preferences include the result of a questionnaire answered at registration to determine which items they are more likely to want to purchase and those they are less likely to purchase.
- **Responsive design:** There are five main operating systems. There are hundreds of internet browsers (11). There are thousands of different devices. A successful website adapts to its device – this is why we believe sufficient efforts must be made to implement device responsiveness. This includes taking into consideration the size, orientation and resolution of a screen where this data is available.

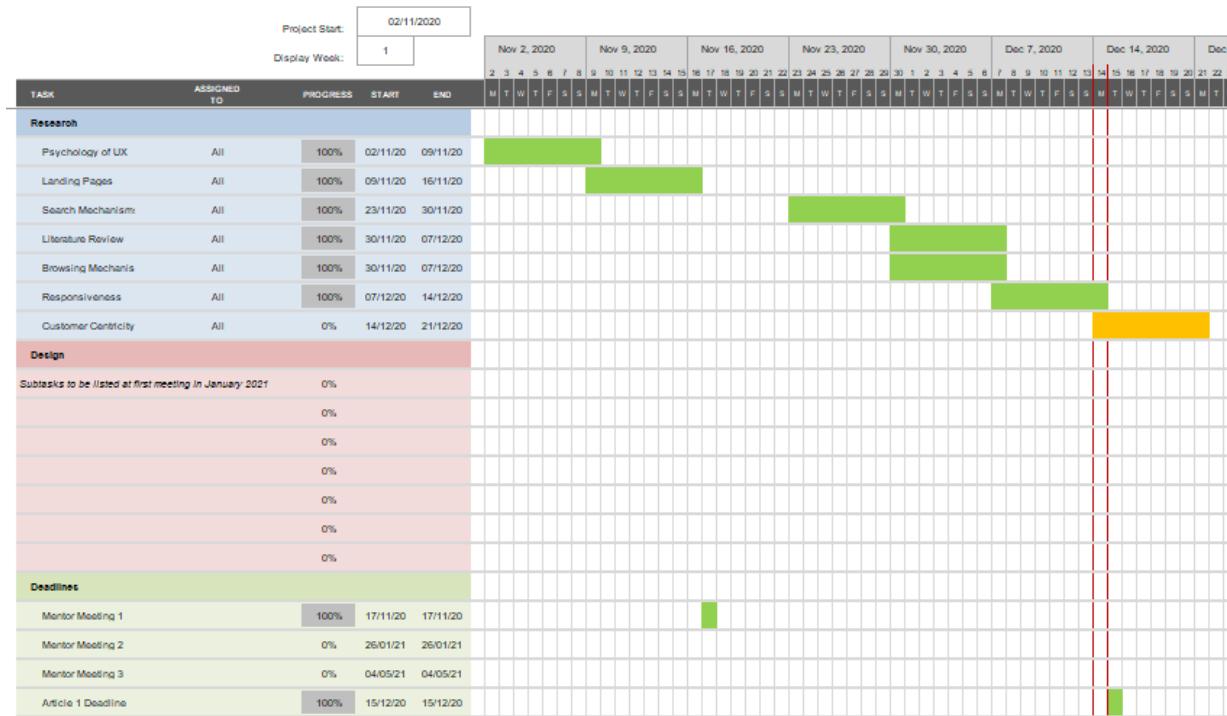


Figure 2

Figure 2 shows our Gantt Chart, with the tasks planned thus far, displayed. We intend to complete all background research by the end of 2020 in order to leave sufficient time to design and realise our prototype in the first half of 2021. We can confirm that we achieved our goal of completing all background research by the end of 2020.

Background Research

The Psychology of UX Design

Colour Psychology

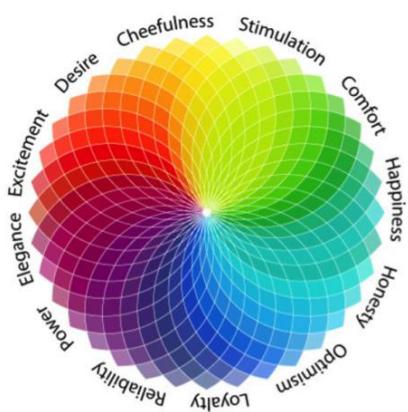
A well-thought-out colour palette is crucial to the usability and user-friendliness of a website. Moreover, a website that does not use colour correctly and appropriately will significantly undermine a website's efficacy and may thereby have unforeseen implications on a company or individual's success.

Considering the moods conveyed by different colours and colour palettes.

Red	Danger; passion; excitement; strong reactions	Light Blue	Peace; trust; reliability; innocence
Pink	Feminine; romantic	Bright blue	Loyalty; trust; communication
Maroon	Subdued; traditional	Dull blue	Depression; sadness
Yellow	Happy; optimistic; creative	Dark blue	Authority; trust; dignity
Light yellow	Dreamy; soft; delicate	Purple	Royalty; wealth; mystery; spirituality
Gold	Wealth; success	Black	Sophistication; luxury; sorrow
Green	Environmentalism; nature; freshness	White	Purity; innocence; positivity; simplicity
Dark green	Wealth; tradition	Grey	Contemporary; unclear; complex
Lime green	Renewal; growth	Brown	Earthly; cosiness; nature; dirty
Orange	Fresh; youthful; activity; energy; social	Beige	Boring; relaxing; calm; dependable

Figure 3

Figure 3 shows a table we have created which matches the main colours on the visible spectrum to their connotations based on their qualities, according to various sources.(12,13) It is evident that colours should not be chosen simply for aesthetic purposes, but also to convey hidden meanings and feelings to ensure an optimal user experience.

**Figure 4**

More generally, these attributes have been consolidated into a wheel (see **Figure 4**) which will aid us in the selection of colours to use in our online shopping UI design. (9)

Shape Psychology

In the world of UX design, shapes are considered as visual grammar. They are essential building blocks to establishing a creative interface, while also considering usability. In addition, shapes and icons have psychological influences, therefore it is paramount that we consider the various use of objects in our website design. (14)

	Squares have a sense of control and containment, reflecting honesty, stability, and uniformity. An example of this can be seen in newspaper articles; the block of texts alongside the images are organised in squares/rectangles across the page.
	Circles have connotations of peacefulness and represent protection and infinity with their round shape. They are used for expressing simplicity and persuasion.
	Triangles are related to action, conflict, and movement. Its pointy corners can be used for a sense of direction, and therefore are very useful for chronological progression.

Figure 5

Figure 5 dictates geometric shapes (one of three classifications of shapes within UX design) and their respective psychological link. (15)

Moreover, Hick's Law states that when the user is displayed with more choice, they take longer to come to a decision. Hence, it is crucial that we use the least amount of choices in our Online Shopping Design so that navigation is made easier and quicker for efficiency, which is one of the targets that we have set to achieve in this project.

Adding to the previous statement, a visual system MUST be put in place to reduce error and confusion. By using many different combinations of shapes, the user may feel overwhelmed. If we take the example of a newspaper, the user will become more confused if the arrangement

of text was sometimes in circles, triangles, and rectangles. Consequently, the aesthetical appeal of the newspaper would make people elude from reading the paper.

Other properties of a shape that is fundamental to the visual appearance of an interface include size, position, and angle of rotation. These three assets should be used appropriately to help improve the design, making it more sophisticated as well as unique. (16)

Simplicity & Clarity

As the internet continues to expand, user attention spans are slowly decreasing, showing that consumers want the ease of navigation and functionality when on a website. To do this, designers aim to maximise the simplicity of a website and the clarity of products and information.

Simplicity and Clarity are two significant aspects of UX Design, which creates an ease of navigation through a website as well as making it appealing to the eye. "Simplicity", in terms of user experience is all about efficiency and designing a product that doesn't have unnecessary components such as sound effects. As Hick's Law states: "The time it takes to make a decision increases as the number of alternatives increases". This means a designer should minimise the steps a user needs to take to navigate through the website, meaning it should be as simple as possible, but clearly portray the information required. Proven ways to create simpler designs include the use of subheadings and tabs to categorise products or areas on a page and also aligning components to give a cohesive look.

Clarity is the measure of how effective a design is in conveying the information required (17). An example of this could be how a product menu page is shown and specifically what information is on it. Key information such as the name and price of the product should be shown bolder or in a larger font, whereas less important information such as where the product is manufactured should still be displayed, but in a smaller font, potentially under another tab. Research shows that the user's eye tends slightly off-centre to the left and right, meaning this is the best place to position key information to grab the reader's attention. It is also beneficial to include a subheading to each large title, as this gives the user a quick insight into what they are clicking.

Background Research

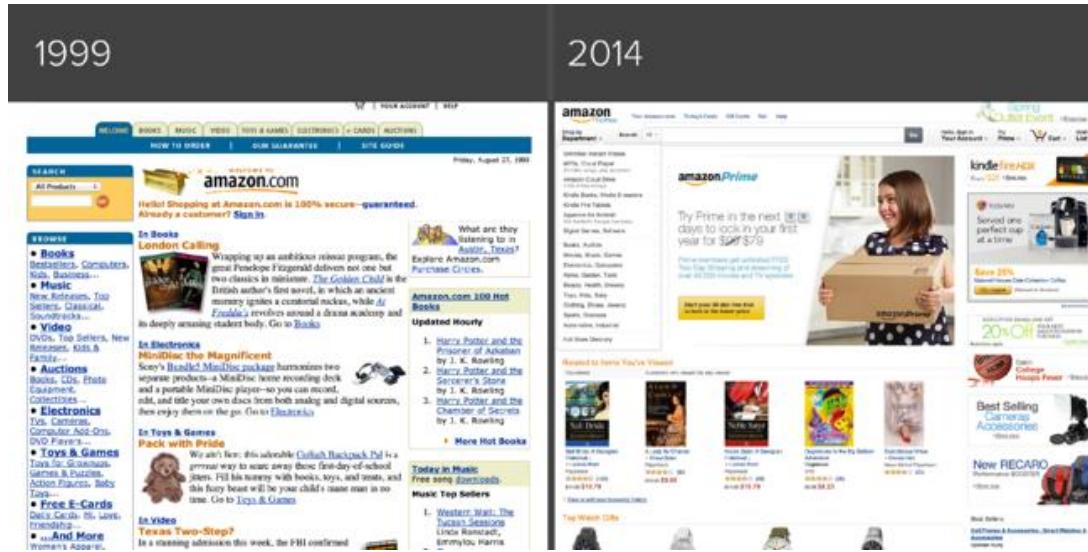


Figure 6

Figure 6 shows how Amazon's website has changed over the years. We can see that clarity has significantly improved, by removing unnecessary information and only showing the relevant aspects of the products. They have also categorised products into tabs, thus creating a simplistic look.

However, we must also make sure we do not over-simplify designs. If we get rid of clickable links on the landing page of the website, it may look simpler, but it means the user has to work more to find the part of the website they want to go to, giving a poor user experience (18).

Analysis of Websites

A significant part of this research subtask is to observe how websites incorporate colour into their websites. **Figure 7** shows the home page and our analysis of two websites that belong to two different organisations.

The screenshot shows the GOV.UK homepage with a black header bar containing links for COVID-19 and EU transition. Below is a blue header section with the text "Welcome to GOV.UK" and a search bar. To the right is a sidebar titled "Popular on GOV.UK" listing recent activity. The main content area contains several service links categorized by topic: Benefits, Disabled people, Money and tax, Births, deaths, marriages and care, Driving and transport, Passports, travel and living abroad, Business and self-employed, Education and learning, Visas and immigration, Childcare and parenting, Employing people, Working, jobs and pensions, Citizenship and living in the UK, Environment and countryside, and Housing and local services. At the bottom, there are two large sections: "23 Ministerial departments" and "413 Other agencies and public bodies".

Her Majesty's Government's Website (3)

Colour

Firstly, one must mention the main colours used throughout this website are black, white and blue. We can see that the header and 'Popular on GOV.UK' sections have a white foreground and black background, whereas the main body has a black and blue foreground and a white background. In addition, the 'Welcome to GOV.UK' message has a white foreground and a blue foreground.

With reference to **Figure 3**, it is highly significant that blue is used heavily throughout the website. This may be due to several reasons, two of which being:

- blue represents loyalty and communication, which are values that the Government of the United Kingdom should have towards the British people and
- blue is the primary colour of the Conservative Party, which (as of 2020) has a majority in the House of Commons; this means the leader of the UK Government is the leader of the Conservative Party.

In addition, blue is the most universally liked colour in the world.

The Government Digital Service specifies the colour palette they use, combined with styles for their images, layout, page template, spacing, typography. In addition, they specify their templates for components (such as error messages and file uploads) and patterns (such as input fields, input validation and confirmation pages) (19). **Appendix A** contains the SCSS file detailing the Government Digital Service's current colour palette for their

Background Research

The screenshot shows the GOV.UK homepage with several service blocks:

- Coronavirus (COVID-19)**: Find information on coronavirus including guidance, support and announcements.
- TIME IS RUNNING OUT**: Time is running out. Take action now to prepare for the new rules in January 2021.
- Get the NHS COVID-19 app**: Use the app to protect yourself and others from coronavirus.
- More on GOV.UK**:
 - Most active**:
 - Find a job
 - Log in to student finance
 - Passport fees
 - Jobseeker's Allowance
 - Council Tax bands
 - Running a limited company
 - Driving theory test
 - Vehicle tax rates
 - Renew vehicle tax
 - VAT rates
 - UK bank holidays**: Check the dates for bank holidays in England, Wales, Scotland and Northern Ireland.
- Is this page useful?**: Buttons for "Yes" and "No".
- There is something wrong with this page**: A link to report a problem.
- Coronavirus (COVID-19)**:
 - Coronavirus (COVID-19): guidance and support
- The UK has left the EU**:
 - Check the new rules for January 2021
- Services and information**:
 - Benefits
 - Births, deaths, marriages and care
 - Business and self-employed
 - Childcare and parenting
 - Citizenship and living in the UK
 - Crime, justice and the law
 - Disabled people
 - Driving and transport
 - Education and learning
 - Employing people
 - Environment and countryside
 - Housing and local services
 - Money and tax
 - Passports, travel and living abroad
 - Visas and immigration
 - Working, jobs and pensions
 - How government works
 - Departments
 - Worldwide
 - Services
 - Guidance and regulation
 - News and communications
 - Research and statistics
 - Policy papers and consultations
 - Transparency and freedom of information releases
- Departments and policy**:
 - Help
 - Privacy
 - Cookies
 - Contact
 - Accessibility statement
 - Terms and conditions
 - Rhestr o Wasanaethau Cymreig
 - Built by the Government Digital Service
 - OGL All content is available under the Open Government Licence v3.0, except where otherwise stated
 - © Crown copyright

departments (20), which we find is a good way to ensure colour uniformity across the site and to also ensure that these colours are easily modifiable from a central stylesheet.

Shapes

It is clear to see that this website has adopted an organised layout, displaying information and images in blocks. The design can be identified as consisting of rectangles, the purpose of which to dignify control and honesty with reference to **Figure 5**. This is crucial as the information supplied by the Government needs to be demonstrated in a way that can be trusted.

In addition, we see no complications with size, rotations, and positions. The distribution of objects and consistency within the design are aesthetically simple and easy to follow.

Adding to this, the website design makes use of Hick's Law, by keeping only the most important (or most frequently visited sections) on the index page, allowing users to clearly identify the purpose of their visit to the website and easily navigate their way to the required parts.

Simplicity/Clarity

The use of labelled clickable links across the page of the website immediately brings simplicity and clarity to the design, especially the column labelled "Most Active", which lists the most active pages on the website. This allows the user to easily navigate to different parts of the website in the least number of clicks, meaning they are more likely to stay attentive.

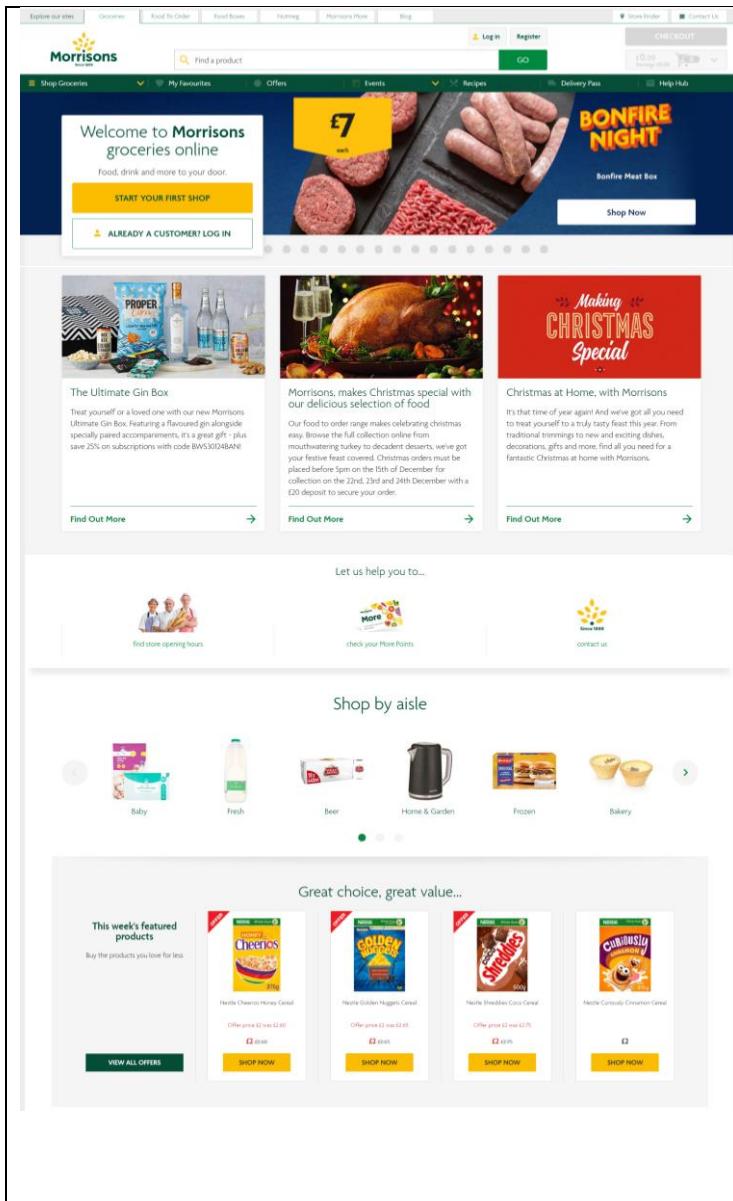
Furthermore, key statistics and titles are given in a larger and bolder font, thus grabbing the user towards it. A search bar is located at the top of the page, which allows the user to search for

Background Research

the information they need without having to navigate through the whole website to find what they need.

Additionally, the page as a whole is subdivided into segments, which not only makes it more appealing to the eye but also increases clarity, as all the information that links to each other is specified in its own section.

Background Research



Morrisons' Website (21)

Colour

Morrisons adopts a (fixed) green navigation bar and green buttons, text and diagrams throughout the home page. The main reason for this is conformity with the company's logo, which is gold and green.

Moreover, green has connotations of freshness, nature and environmentalism. This closely ties in with the first part of one of Morrisons' slogans, *Morrisons: freshness, service and value*. Furthermore, the 'service and value' part of their slogan ties in with the 'comfort and happiness' connotations shown in Figure 4.

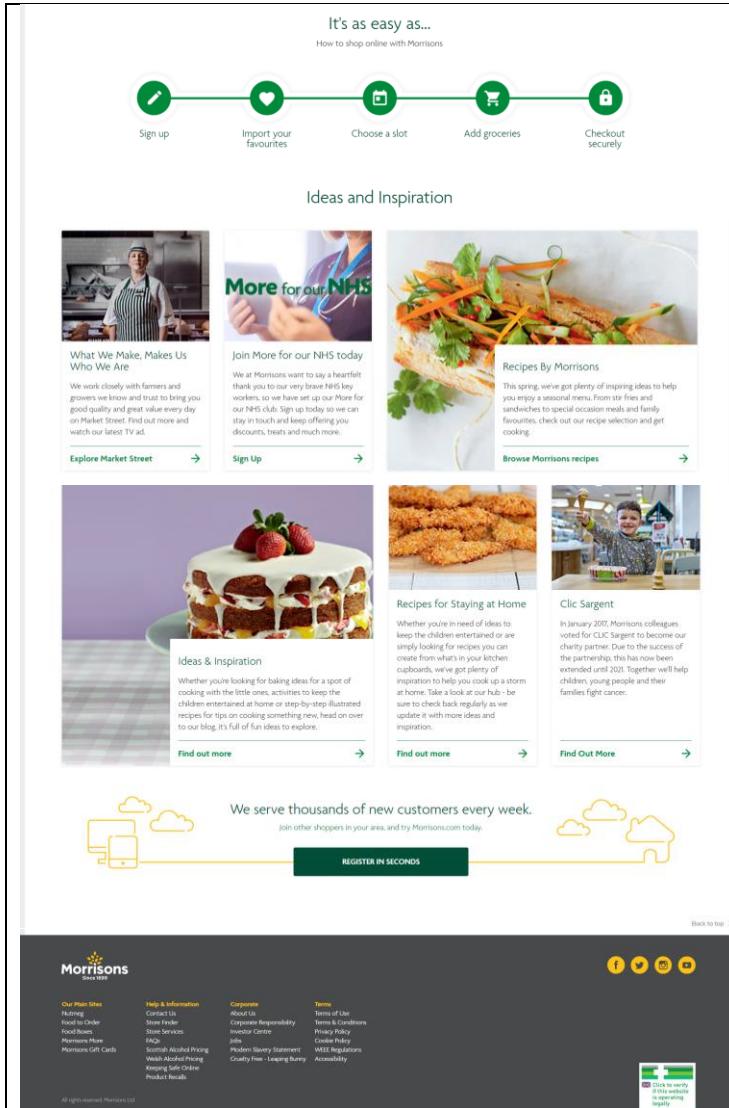
With regards to, more broadly, the UX design itself, it is evident that Morrisons' website uses many animations. Most of these are images (with links) of products that are on offer. The fact that these images do not conform with the overall colour scheme used throughout the website grabs the user's attention and adds emphasis to the offers displayed.

Shapes

Instantly, there is evidence of a dedicated system to the layout of the Morrisons website. At the top, we see a billboard replica, to promote deals. Underneath, there are multiple circles, meaning that the rectangular shapes have been assigned to showing information and items whereas the circles are used in the scrolling mechanism. Therefore, it helps users to easily work out the functionality of the design.

Furthermore, Figure 5 explains the circle as representing infinity. Looking back at its purpose, it seems appropriate to use this shape due to the fact you'd want to scroll through each of the deals and repeat this infinitely.

Background Research



Moreover, the design has very symmetrical patterns (which is especially well demonstrated in the 'Ideas and Inspiration' section); allowing the content to be scanned and understood, consequently displaying stability at the same time.

Simplicity/Clarity

Morrisons have created a clear and fairly simplistic landing page, where you can "shop by aisle"; a concept which we would like to incorporate into our design. This allows users to buy their groceries the same way they go through the aisles, for example, adding all the dairy products to the cart simultaneously. This increases simplicity and means that the user can stay on one page and do all their shopping in one go.

Another way that Morrisons have added clarity to their website is through the addition of a login bar at the top of the page, so returning customers can quickly log in and be able to shop more efficiently.

Furthermore, the use of images is key in Morrisons design. Most customers would recognise their weekly groceries visually, rather than by name, so this is a key aspect they have incorporated in order to create an appealing, clearer display.

Figure 7

Landing Pages

A landing page is the first point of contact with the user and has the simple role of "converting" them. This means, making them interested and keener in viewing the rest of the website. Additionally, to get the conversion, the landing page should contain (22):

- **Clear, structured layout** – this makes it clear to the user the purposes of the website
- **Visual hierarchy** – anything that makes the website look aesthetically appealing and guide the user around the contents
- **Strong argument** – a main point on the page that gives an obvious message and is free of ambiguity
- **Balance** – all the above should work together coherently, one should not overpower the other but rather use each of the components to stand out



Figure 8

If we look at the example of Sainsbury's landing page (23), there is a clear focus on festivity. The layout has been carefully planned so that the "Get ready for Christmas" promotion is the first thing visible to the user. Moreover, there are smaller blocks below promoting other offers. The colours have been balanced so it is not overpowering, but not bland. Finally, the argument is quite clearly the promotion of Christmas deals and Christmas-related items for sale. Therefore, anyone with the intentions of purchasing Christmas products are effectively encouraged to further explore the website.

In our case, we are designing an online shopping website, meaning one of our main objectives for the landing page is to make the user's shopping as quick and easy as possible. On Morrison's, Sainsbury's and Ocado's websites, there are options to quickly log-in and add popular products to the cart.



Figure 9

As seen above, Ocado has three options as soon as you open their page: "Start shopping", "Offers" and "Book a delivery". This means customers can swiftly navigate to each of these pages without having to click on several links to get to complete the tasks they desire.

Combining our research on Simplicity, Clarity, Shapes and Colours, the landing page should consist of several images that highlight specific products and using simple, yet bold fonts to

improve the clarity of the design (24). Alongside this, colours can be used to separate categories within the landing page. Above, there are light colours on the right of the page, which attract the user's eyes to the main links. This is combined with the green on the left of the page to reflect Ocado's brand colours.

In addition, a compelling landing page must define the company in question's value preposition (6). For example, this is Lidl's landing page (25):

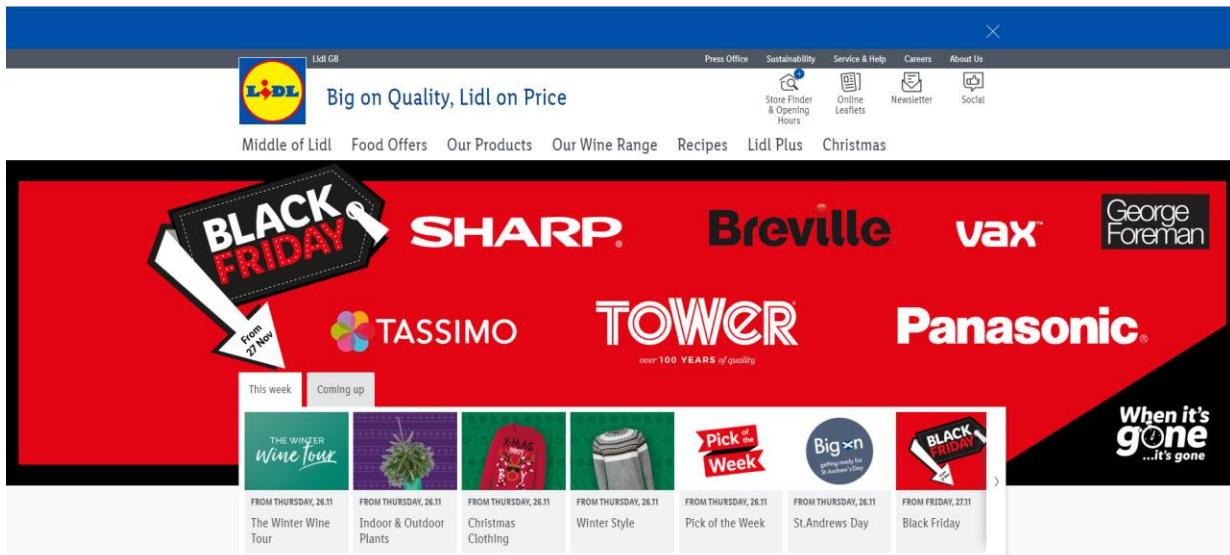


Figure 10

Lidl is known for its slogan “Big on Quality, Lidl on Price”, and this is arguably one of the first things a user sees when they enter the site. The meaning behind this value preposition is very well thought-out and it includes a pun (“Lidl” being used for “Little”). Furthermore, it is significant to note that this appears throughout Lidl’s physical stores – therefore its use on the landing page induces a sense of familiarity and belonging for the user, thereby reducing the gap between the real and online shop.

It is also clear that the value preposition must not be meaningless. It should not state the obvious and, as a rule of thumb, the opposite of the value preposition should still be a valid option. For example, “We have a wide range of products to suit every customer”, the opposite of this would be “We have a small range of products to suit certain customers”. This would therefore be tending towards “stating the obvious” and could be improved by highlighting a different positive aspect of the company in question, such as “We offer food, non-food, wine and recipes”, as Lidl’s webpage title states:



Figure 11

Finally, a landing page should feature a visual hierarchy. Paul Boag suggests the following structure for a landing page (6), which combines a company's value preposition, benefits,

Background Research

features and social proof/testimonials in an order which is most successful at inducing a positive response from the user:

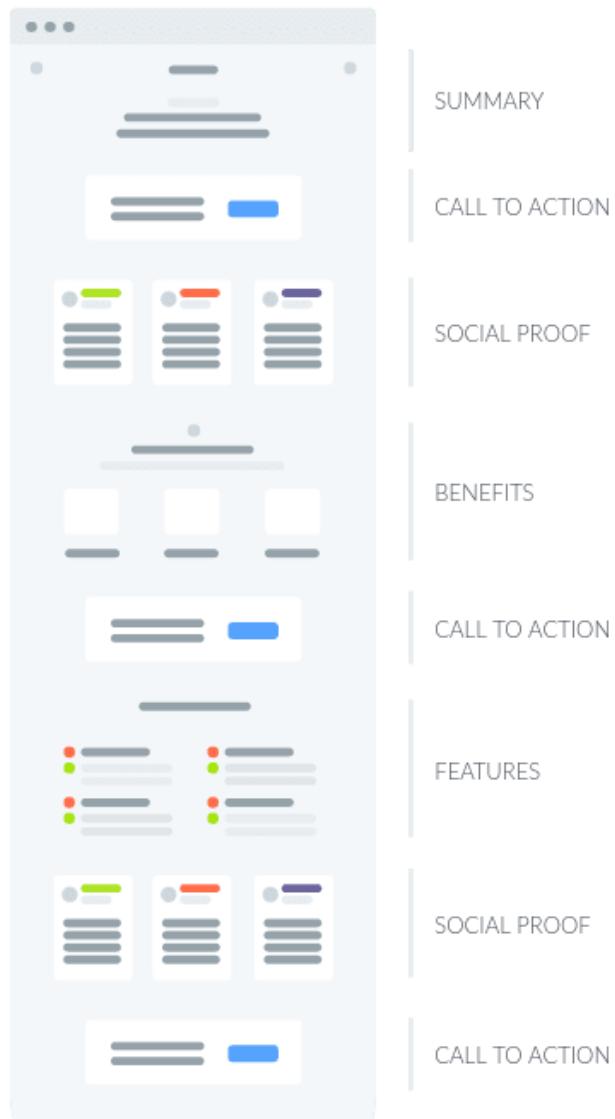


Figure 12

Search Mechanisms

The search bar has been found to usually be the first interaction a user has with a website, so it is imperative that we focus on improving the efficiency of search mechanisms for our designs. Below are several methods used by online shopping retailers on their websites. (26)

Barcode Scanning

One of the very popular search mechanisms used in online shopping websites is barcodes. It is a very simple tool that allows customers to scan barcodes of items they have at home and enable them to find the given item on the website in a matter of seconds. The use of barcode scanning as a search mechanism eliminates the possibility of human error, as it is very easy to accidentally misspell a product name; however, by scanning the product barcode it can take you straight to your desired item without having to frantically search through numerous pages.

Online shopping company, Ocado, use barcode scanning as they have found this to be the quickest and most efficient search method. Upon embedding this search mechanism into their mobile app (Ocado on the Go), they observed a decrease in the amount of time users spent shopping for their regular groceries, as the customers were able to quickly scan a product and add it to their cart.

On the other hand, there are also limitations to the use of barcode scanning. Mobile phones have cameras on the front and back, so they are easily able to scan a barcode of a product, however, laptops and other larger devices only have webcams at the front of the screen, so it makes it much more impractical to scan a product and therefore, many users would choose to manually enter the product name compared to using the barcode scanner. To overcome this issue, when designing our prototype, we can optimize the scanning feature for the mobile version of the website, especially as 54% of all online sales are set to be from mobile devices by 2021 (27).

Spell Checking / Autocorrection

As mentioned above, users may not always correctly spell their desired product, so we must find a way to autocorrect certain phrases, so they do not end up in an unwanted location. Our main focuses here, are to display product names that are similar to what the user inputs, so they have the option to choose. We can do this by using a **federated search method** (28). If we produce a database of all the products on the website, we can use Index Time Merging to list products that are similar to the inputted text. This is very useful, as we can add and remove products from the database, and they will automatically be updated in the autocorrect list.

Searching in e-commerce websites has noticeably been overlooked by UX designers. In the industry, 70% of these websites fail to produce relevant results to the user's searches and this can be detrimental since research has shown that a person is three to four times more likely to spend more time in a website where the on-site searching mechanism is successful (8). The following shows various methods that enhance the search mechanism experience for the user.

AutoComplete

The main purpose of the auto-complete function is: to save time; find appropriate results rapidly and iterate the search queries. The benefit of this is producing more relevant products in a shorter space of time. Additionally, auto-complete can be more critical than what people believe due to the fact that spelling mistakes can be 'fatal' in searching, therefore auto-complete reduces the probability of this occurrence.

By using the example of Google, almost everyone expects the infamous search engine to predict and auto-complete our searches. That's why when starting to type, the user is suggested with many options after every key has been pressed to show the user with all the auto-completed options to help them choose what they are looking for without having to type the entire phrase/word.

Recommendations

A recommendation engine provides products/topics to a user that they may not come across normally through manual searching (29). This concept can work in two ways:

- Looking at popular searches of other users
- Considering the users searching methods

A combination of the two methods above can help provide relevant, trendy options for viewers during their search.

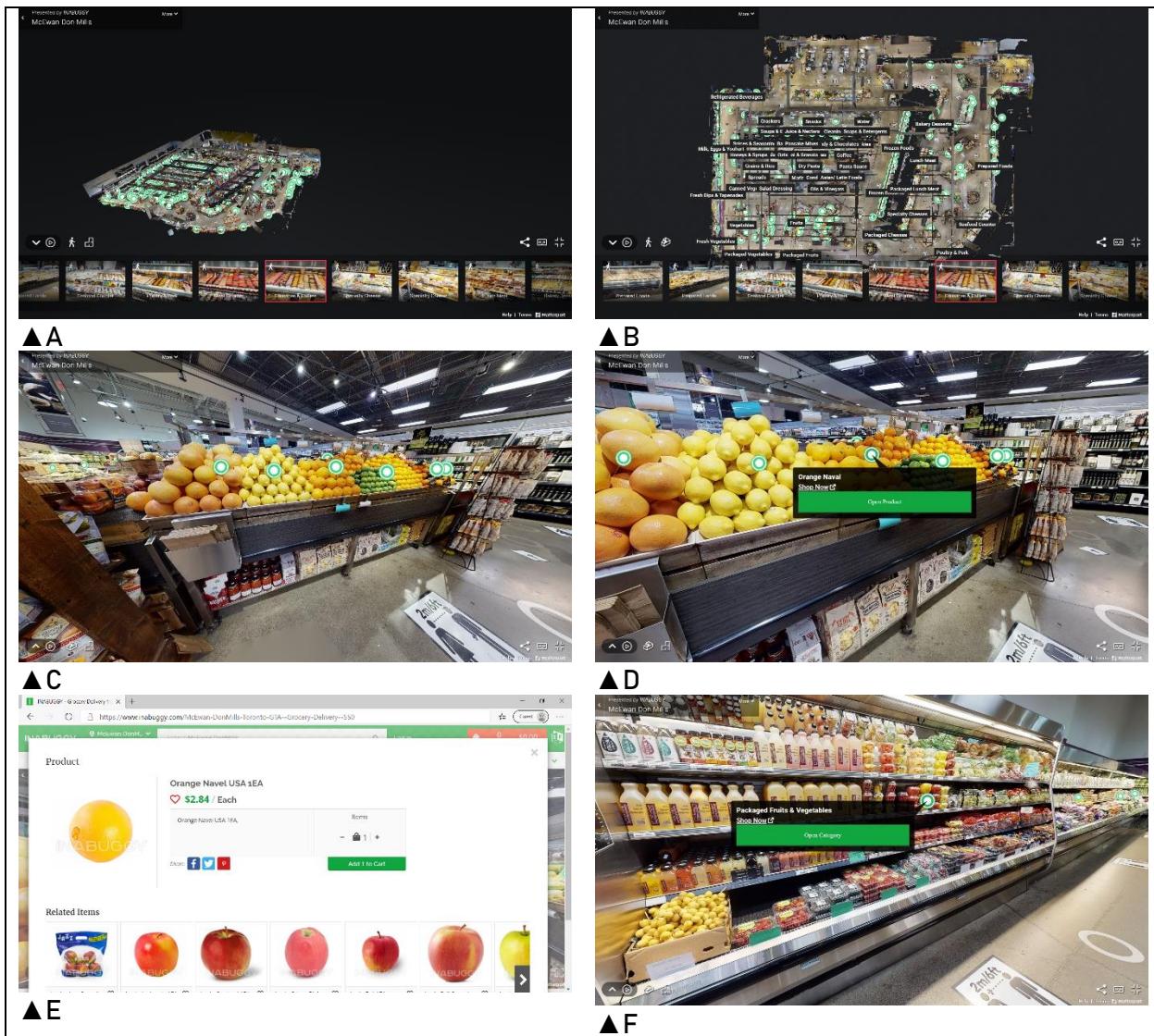
Adding to this, it is ideal to analyse the way people tend to search for items alongside their geographical distribution and group these people together, allowing members with similar interests to be suggested products that have reviewed and/or looked at by other members of the same category or group. A good example of this is apparel websites that show the category: "What others have bought..." .

We believe a combination of auto-completion and recommendations will assist in a very robust search mechanism. By taking Google as an example, the user is prompted with a list of options that is updated every time a key is pressed to give the most relevant searches.

Browsing Mechanisms

Virtual shopping

One solution we propose is the implementation of a virtual shop in which users can navigate through the shop. As outlined in the Literature Review, few supermarkets have implemented this approach, and while it has been successful on the whole, there is definitely room for improvement. Here we analyse and evaluate INABUGGY's implementation (30), which was driven by the influx of online shopping in Canada due to the COVID-19 pandemic.



Background Research

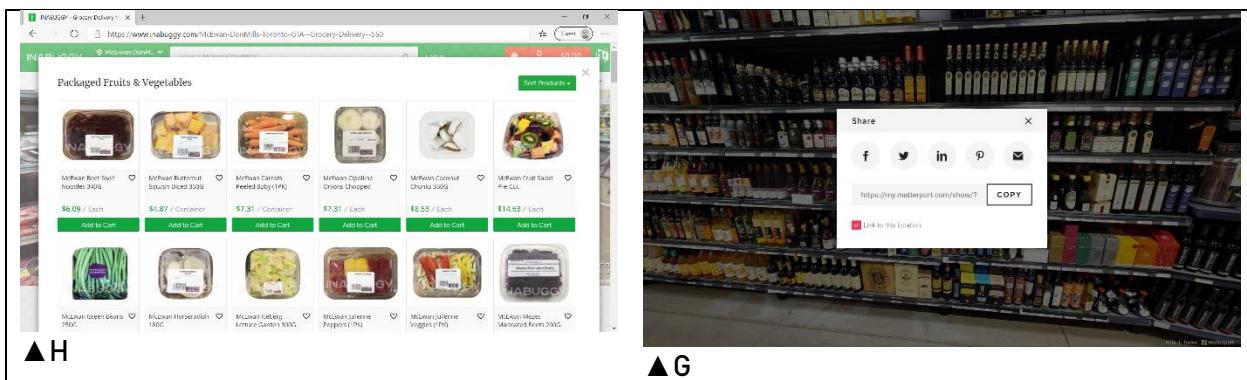


Figure 13

Figure 13 shows eight snapshots from INABUGGY's implementation.

Evaluating this implementation

Feature	Image	Strengths	Weaknesses
Doll's house perspective	A	Allows a user to view the entire store at once. Widget at the bottom the screen provides a means of selecting the appropriate section of the store.	Appears too overcrowded. No text is visible to describe each section.
Floor plan	B	Allows a user to view the entire store at once. There is text to describe each section of the store. Widget at the bottom the screen provides a means of selecting the appropriate section of the store.	Appears too overcrowded. There is overlapping, and hence unreadable, text.
Virtual movement	C	Navigation method is similar to that of Google Maps, which users are likely to be familiar with. It is easy to move from section to section. The store has been tidied prior to filming to ensure products are neatly organised and easy to find.	This approach requires special cameras and software to film 360° images and stitch them. Filming must take place while the store is closed to customers. The store must be tidied thoroughly prior to filming. In order to ensure users can 'shop' from their nearest store, the filming process must be repeated for all stores, although this is not completely necessary.
Product button	D	Clicking on the green circle reveals a simplified product page for a user to quickly add the item to their cart.	This feature does not work in full-screen mode. There may be too many different brands of an item for each to be reasonably presented by a green circle in the simulation.

Background Research

Product page	E	The product page is simplified and only contains the necessary information for a user to confirm it is their desired item. Related items are displayed just below in a clear and appealing format such that the user can easily access them.	This feature does not work in full-screen mode.
Category button	F	This is more appropriate than providing a green circle for every single item on a given shelf, i.e. where there are many variations of a single item.	This feature does not work in full-screen mode.
Category page	G	The products in the given category are displayed in a user-friendly format, with an easy-to-use mechanism for a user to add products to their cart.	This feature does not work in full-screen mode.
Sharing	H	Users can easily share their location within an online store with others by means of a link.	This feature isn't very useful or necessary to have.
VR	-	Users can shop by means of virtual reality. Having tested this feature, we can confirm that it definitely adds value to the idea of a "virtual shopping" experience, despite not requiring a user to walk around their houses.	Not all users have access to the necessary VR equipment.

Overall, it is evident that this approach adds value to "online shopping". It is simple for a user to navigate through the virtual store and find items as they would in a physical store. Products are arranged in an appealing, neat and tidy manner in the store and there is a sufficient number of locations within the store at which 360° images have been taken. However, this approach is likely to be more costly than implementing a typical browsing mechanism, both due to the need for specialist equipment and the complexity of the system.

Navigation pane

Categorisation

Product Categorisation is undoubtedly a very useful browsing mechanism. It allows for users to view items that are in their desired subsection, very much like aisles in a supermarket and the overall clarity/simplicity of the website is enhanced, as users spend less time searching with free text.

In order to optimise this process, we need to allow ease of access for the user. This can be achieved by considering the categorisation of products at several levels. For example, if a product was under a broad Healthcare category, it can be classified further, potentially into "Vitamins" or "First Aid". To do this, we would have to look at all items in the database and iterate through the list to decide what sublevel each item would fall under. This is a lengthy process; however, it can be slightly automated using the following methods, which all work using predictions.

Random Sampling

Many products come under a small subset of categories (roughly 80% of products fall under only a fifth of total categories), which shows a large disparity between the size of categories. To handle this, stratified random sampling can be used to even out the categories, so they aren't as heavily imbalanced. This makes each category easier to navigate through.

Classification Models

Many products come under a small subset of categories (roughly 80% of products fall under only a fifth of total categories), which shows a large disparity between the size of categories. To handle this, stratified random sampling can be used to even out the categories, so they aren't as heavily imbalanced. This makes each category easier to navigate through.

In terms of the design of the navigation bar and categories, we can look at other online shopping stores to evaluate which is the best approach. Figure 14 shows the navigation tabs for Ocado and Morrisons.

Background Research

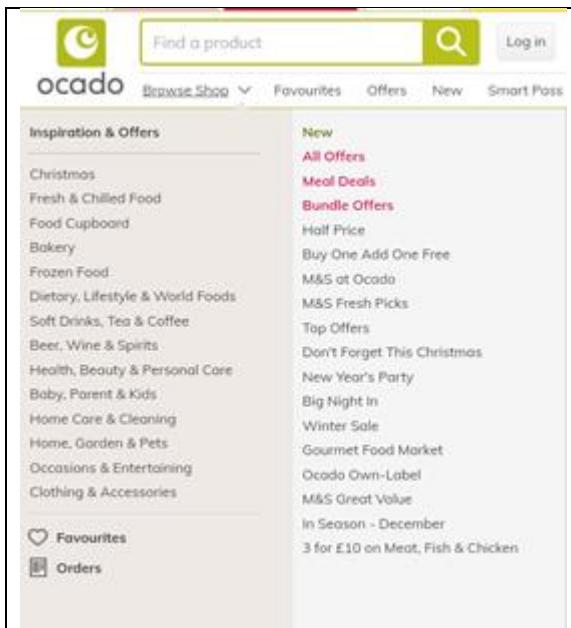
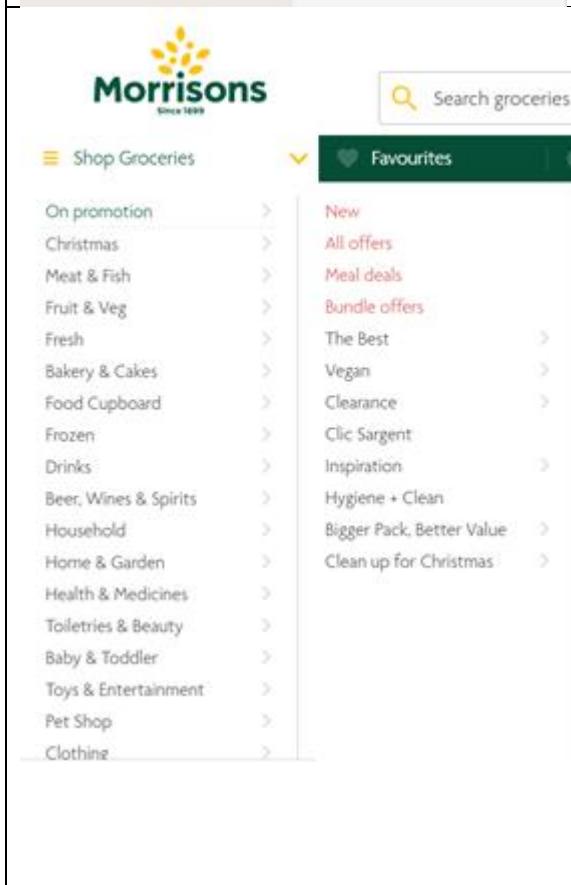
 <p>The Ocado navigation menu is organized into several main categories: Inspiration & Offers, Christmas, Fresh & Chilled Food, Food Cupboard, Bakery, Frozen Food, Dietary, Lifestyle & World Foods, Soft Drinks, Tea & Coffee, Beer, Wine & Spirits, Health, Beauty & Personal Care, Baby, Parent & Kids, Home Care & Cleaning, Home, Garden & Pets, Occasions & Entertaining, Clothing & Accessories. A sidebar on the left includes Favourites and Orders. To the right of the main categories is a column for offers and deals, including New, All Offers, Meal Deals, Bundle Offers, Half Price, Buy One Get One Free, M&S at Ocado, M&S Fresh Picks, Top Offers, Don't Forget This Christmas, New Year's Party, Big Night In, Winter Sale, Gourmet Food Market, Ocado Own-Label, M&S Great Value, In Season - December, and 3 for £10 on Meat, Fish & Chicken.</p>	<p>We can see that Ocado has sorted the categories by popularity. As it is December, the Christmas category is at the top, followed by Fresh & Chilled Food. This is because users are currently looking for items that fall under these categories, more than the ones below. Sorting categories by popularity would be a great way to improve convenience for the user, as they don't need to scroll down to find the category they want. Additionally, there is another separate column for offers and deals. This is very useful for customers that are trying to save money, and we have seen in previous research that online shoppers regard competitive prices as one of their main expectations.</p>
 <p>The Morrisons navigation menu includes a main menu with Shop Groceries and Favourites tabs. The main menu lists categories such as On promotion, Christmas, Meat & Fish, Fruit & Veg, Fresh, Bakery & Cakes, Food Cupboard, Frozen, Drinks, Beer, Wines & Spirits, Household, Home & Garden, Health & Medicines, Toiletries & Beauty, Baby & Toddler, Toys & Entertainment, Pet Shop, and Clothing. The Favourites tab shows sub-levels for New, All offers, Meal deals, Bundle offers, The Best, Vegan, Clearance, Clic Sargent, Inspiration, Hygiene + Clean, Bigger Pack, Better Value, and Clean up for Christmas.</p>	<p>It is evident that Morrison's and Ocado's navigation tabs are extremely similar. They sort categories by popularity and also have a column for deals, offers and new products. However, when looking deeper into each category, Morrisons has three sublevels, compared to Ocado's one sublevel. This allows Morrisons customers to navigate through the categories more easily if they know the exact product they are looking for. However, if a user is unsure what sub-category their desired product comes under, it would be more challenging for them to find it. On the other hand, Ocado has kept their navigation tab simpler, so users can't go deep into each category, but this also means users are encouraged to look at more items, which may subsequently prompt more purchases from that category.</p> <p>Looking at both designs, they are extremely, so we could use their ideas, but we would have to decide how far we want to categorise the products.</p>

Figure 14

Customer Centricity

Suggestions based on viewings and basket

Product suggestions based on analysis of customer behaviour can be crucial for any business in helping to create more sales. This is because exposure to new items allows customers to see what other products an online store has of relevancy with the reduced hassle of browsing or searching. A report suggested that 70% of Amazon's sales have been through recommendation evidently showing how important this feature is to an online shopping website (31). Various methods used to achieve this effect include:

- “*Other customers also viewed...*” or “*You might also like...*” – this feature identifies similar interests and shopping behaviour of customers in order to give the best-suited recommendations.
- “*Frequently bought together*” – this involves grouping products together which complement each other and suggest these for ease of access for the customer (e.g., pillowcases for pillows).
- Add-on recommendations – by looking at the current behaviour of the shopper, this method predicts the users next actions to stay one step ahead, even if the shopper was not thinking about this (one good example of this is Expedia which plans flights and recommends hotels at your destination) (32)
- “*More like this*” – by giving various options of the same product but from different brands, customers can quickly see the product that has the best deals or a preferred brand.
- Bundles – a feature of Curry's PC World (see Figure 15) is including bundle deals alongside their products in order to encourage and manipulate a shopper into buying more thinking they are getting more for their money (33).

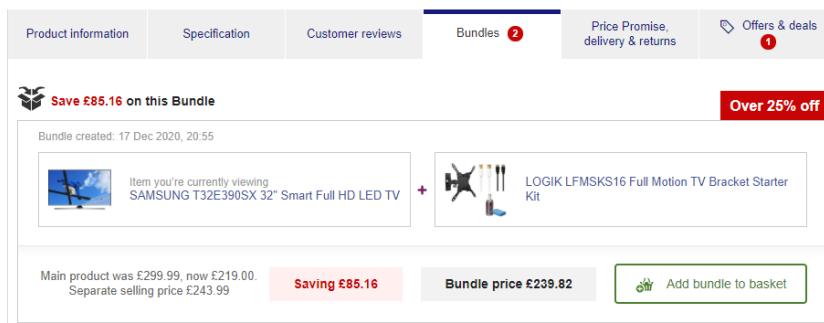


Figure 15

In conclusion, creating an experience for a customer by making customised recommendations of products for shoppers encourages them to explore the library of items available to them. The key idea is to make sure the right products are shown to the right group of people by using algorithms to implement the methods above.

Dealing with dietary requirements

Not all products will be applicable to all users. For example, a certain customer may have dietary requirements due to conditions such as gluten intolerance. Such users would value an option to filter products (or set a default filter) in order to display solely gluten-free products.

Currently, some online grocery shops have implemented a physical dietary filter for their products. For example, Tesco has a small section, usually half an aisle, in most of their stores where shoppers can find items that are free from gluten, wheat or milk, for example.

Importantly, Tesco has also implemented this on their website, where there is a section specifically designed for shoppers with dietary requirements (34), as shown in Figure 16.

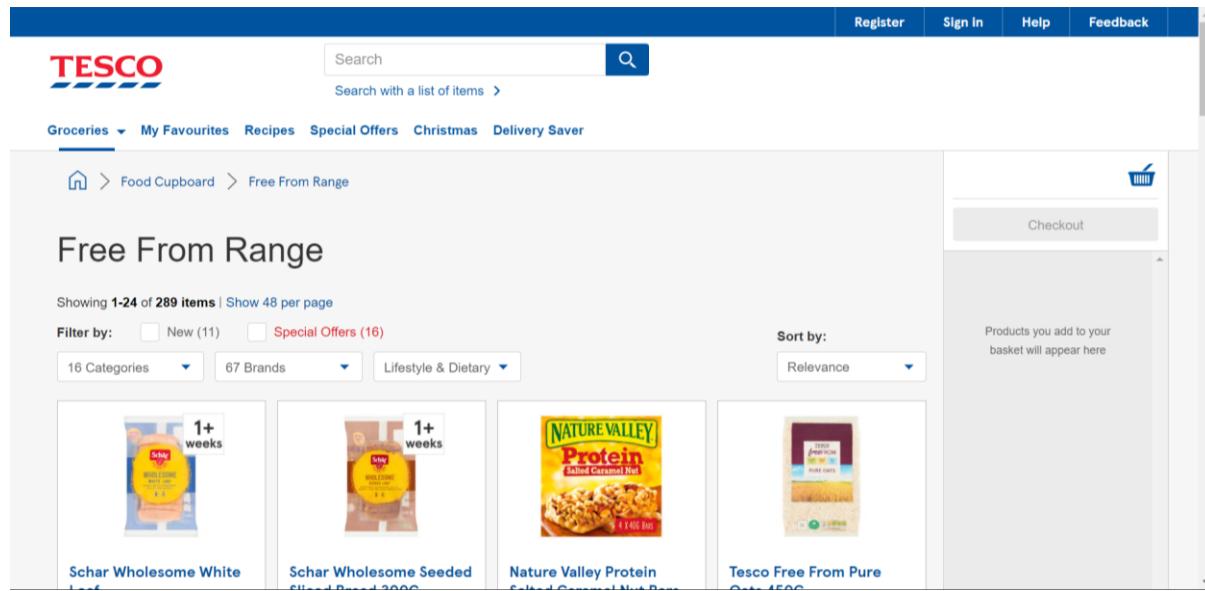


Figure 16

However, one of our ideas was to implement an automatic filter to all searches rather than to make it a separate category accessible by the browsing mechanism. The enablement of this filter could be controlled from a search setting in the user's portal, and the initialisation of this option could be sourced from a questionnaire upon registration.

This questionnaire could also be used to learn about the user's preferences. Through the use of high-level artificial intelligence, a program can learn about the user and predict their behaviour based on the user performing simple. For example, we learn in *The Secret Rules of Modern Living Algorithms* documentary that through a user selecting which films they like, a computer can instantaneously change its perceptions about the user and make more accurate predictions about whether they will be interested in a given collection of other films (35). Similarly, the code behind our online shopping website can use libraries such as PyTorch (36) to echo this functionality in a different context by obtaining and implementing the results of simple questionnaires/surveys conducted at registration and occasionally throughout a user's online shopping experience.

Using Shopping History to suggest products

When suggesting products, the most general method would be to identify the most popular items across all users. However, many users will find the “most bought” items unappealing to them, rendering the suggestion useless to them. Therefore, a much more customer-centric method would be to identify which items are most favoured by each customer, based on their shopping history. This increases efficiency as they are able to quickly select their weekly groceries with minimal use of any searching mechanisms.

There are several techniques that are already in use by major online shopping retailers, which we could implement into our design. For example, Sainsbury's have a feature where users can find their previous shopping orders and repurchase the same items, which saves them from tediously adding each item to the cart (37). We can include this by adding a “suggested cart” tab, where a cart can be made based on a customer's previous orders, adding items that are similar to what the user has bought in the past.

Another technique used by shopping websites is to look at certain trends of buying, also known as a customer profile (38). From a user's previous orders, we can find information such as:

- *Most popular brands* – this would allow us to suggest more products from that brand, or similar brands, as they are already familiar with it and therefore, more likely to purchase.
- *Items to avoid* – if we identify what type of items haven't been purchased by the user before, it lets us know to avoid suggesting these items as the user may not be interested in them. For example, if the user doesn't have a pet, they wouldn't buy animal toys etc., so we would not suggest any of those items.

The more information we can obtain from these trends, the more we can build a customer profile, meaning we can maximise how user-tailored our suggestions are.

Responsive Design

Responsive design is the idea that a website should have the facilities to accommodate a user's behaviour and input based on their operating system, screen size, and device orientation. The importance of this topic is due to the rising numbers of mobile users visiting websites, with over half of website traffic coming from mobile devices. Additionally, it is especially paramount to include this in e-commerce websites since people are finding purchasing items on their portable device more convenient.

There are things to consider when it comes to device responsiveness, some of these include:

- Text sizes should be large enough for the user to clearly read on their respective device.
- Images should be scaled accordingly to the size of the screen, so the pictures are not cut off or too small to see.
- Mobile users should not be limited due to their screen size.
- Mobile users should have arrangements to make navigation easier (39)

User Experience

By making the website design poorly optimised for mobile devices, it can cause problems with the user's experience. This would lead to the user becoming frustrated and choosing to leave the website which is the opposite of the intentions of most UX designers and the companies represented by the website. Therefore, the elements of a website must adjust to screen size by changing the display of the objects laid out on the screen. One way to overcome this issue is by using Bootstrap (CSS) which has built-in responsiveness code.

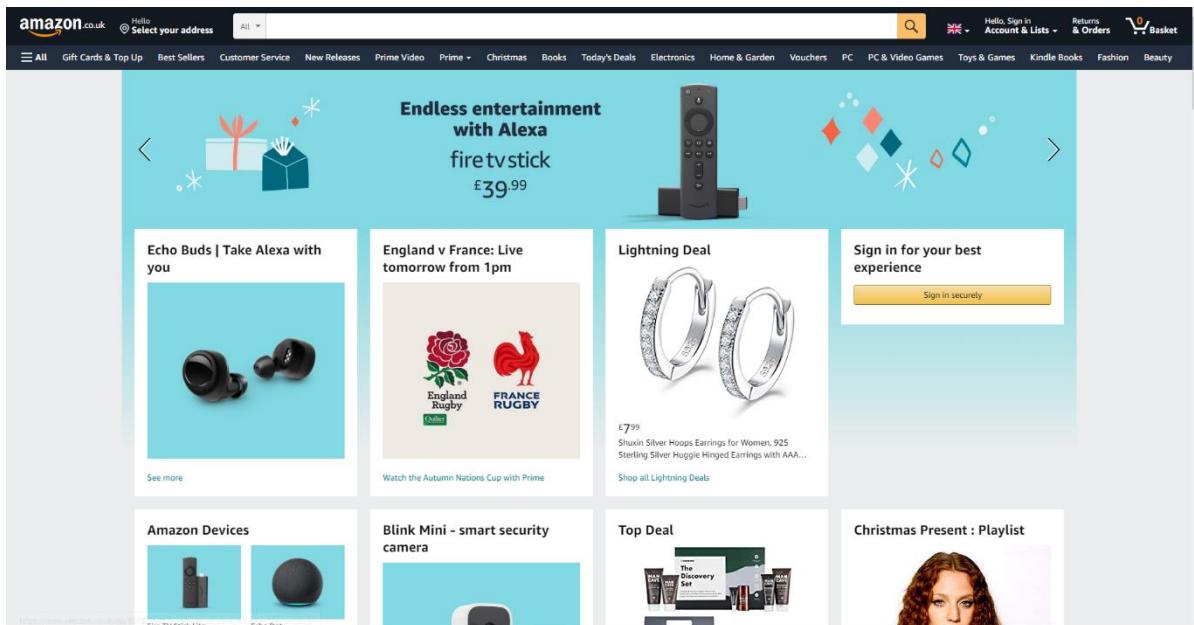


Figure 17

Background Research

In Figure 17, we see how the Amazon website chose to layout the elements horizontally to make use of the space in a desktop version of the website. This is to maximise the amount of information given to the user; however, it is not done in an overwhelming manner (as discussed in **Simplicity & Clarity** section of this document).

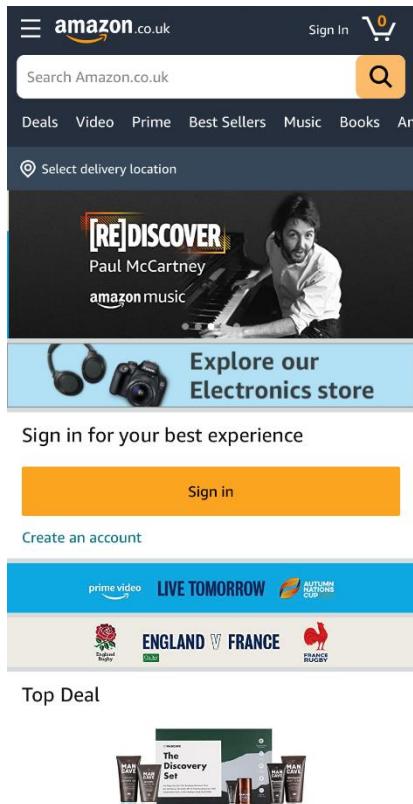


Figure 18

In Figure 18, there is evidently a different layout compared to Figure 17. Firstly, the website removes some elements, which includes the returns and region selection options. Moreover, the sub-sections have been implemented to allow the user to scroll through the options. Finally, the layout itself has been altered to feature predominantly vertical scrolling due to the relatively small width. This makes sure the mobile user can still access all the deals and range of items on the Amazon website that a desktop user is able to.

Time Efficiency

Having a responsive website is advantageous in comparison to adaptive designs. This is because the layouts do not have to be changed significantly meaning it will take less time to deliver the website to the user's screen. This means the design is more fluid and versatile for all devices whether being a desktop or mobile. The benefits of this include lower costs, smaller maintenance requirements and incredibly lower output times and therefore is a bonus for user experience. (35)

Design

We collectively designed our website through the use of Wix and Figma.

First of all, using our initial research pertaining to colour psychology, we created our colour palette to reflect the values of a typical online grocery shopping company.

Colour	Hex	Reasons
Light green	#E7F3E8	We used light green as it gives a fresh look to the website. This will be also be used for the background.
Moderate green	#88C176	Moderate green and dark green will be used for certain textboxes or headings. Dark green signifies ambition, but we particularly used it as it is in line with our colour palette and gives a contrast to the lighter colours, making text stand out.
Dark green	#2A6048	
White	#FFFFFF	White is a universally used colour and the basis of almost everything. This will be used for the background.
Black	#000000	Black has a sense of presence with its dark colour, making it stand out. This will be used for fonts and outlines.

Figure 19

Figure 19 shows our colour palette, which has been applied to the entire website.

We have initially used Wix to design our web pages which will be combined into one website with links between these web pages. Figure 20 shows our designs so far (note that these designs are not final and are subject to change prior to submission).

Design

The homepage features a top banner with the text "WE'LL DELIVER < EVERYTHING YOU NEED" and a "SHOP NOW" button. Below this is a "Weekly Deals" section with four items: Eggs (15 pack), Tomato, Shredded Cheese, and Washing up liquid. A "Grab 'N Go" section follows, displaying items like Deli Cheese, Pears, Milk, Bananas, and Bread. At the bottom are sections for "Pick Up Options", "Same Day Delivery", and "Health & Safety Rules".

The shop page has a "Shop" header and a "Filter by" section with dropdown menus for "Collection" (All, Deli, Dairy & Eggs, Fresh & Greens, Household Goods) and "Price". The main area displays a grid of products including Sausages, Cabbage, Milk, Bananas, Potatoes, Bread, Pasta, Spinach, Butter, Courgettes, Toilet Paper, Tomato, Pears, Eggs (15 pack), Apples, and Bread. Each product has an "Add to Cart" button. A footer at the bottom includes links for "STORE", "ADDRESS", "OPENING HOURS", "GET IT FRESH", "Shop All", "Shipping & Returns", "Store Policy", "FAQ", "Email", and "SUBSCRIBE NOW".

Design

This site was designed with the WIX.com website builder. Create your website today! [Start Now](#)

JR² Home Browse Store Locator Contact ⌂ Pound LDN ⌂ 



Tomato
£0.90 - £1.90

Quantity

Add to Cart **Buy Now**

PRODUCT INFO
Small, red, British-grown tomatoes.
1 kg of 5 a day.

REFUND POLICY
If there is a problem with the product, we can offer a full refund within 30 days of purchase.

Return Address:
Kings College London Mathematics School
60 Kensington Road
London
SE11 6NU

SHIPPING INFO
Item will be delivered straight to your doorstep or shipped to a nearby pickup point for collection.

STORE ADDRESS OPENING HOURS GET IT FRESH

Shop All Kings College London Mathematics School Mon - Fri: 7am - 10pm Email *

Shipping & Returns 80 Kensington Road Saturday: 8am - 10pm SUBSCRIBE NOW

Store Policy London Sunday: 8am - 11pm

FAQ

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JR² Home Browse Store Locator Contact  

Basket [Continue Shopping](#) [Order Summary](#)

Item	Description	Price	Quantity	Action
 Tomato	Red cherry tomatoes	£0.90	X	- +
 Eggs (1/2 pack)	Organic eggs	£1.99	X	- +
 Banana	Fresh bananas	£0.99	X	- +
 Milk	Whole milk	£0.79	X	- +
 Potatoes	Boiled potatoes	£1.49	X	- +
 Spinach	Fresh spinach	£1.00	X	- +
 Courgette	Creamy courgettes	£1.50	X	- +
 Pears	Fresh pears	£0.49	X	- +
 Sliced Cheese	Sliced cheese	£0.90	X	- +

Enter a promo code 

 SSL SECURE SHIPPING Your details are safe and secure 

STORE ADDRESS OPENING HOURS GET IT FRESH

Shop All Kings College London Mathematics School Mon - Fri: 7am - 10pm Email *

Shipping & Returns 80 Kensington Road Saturday: 8am - 10pm SUBSCRIBE NOW

Store Policy London Sunday: 8am - 11pm

FAQ

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41

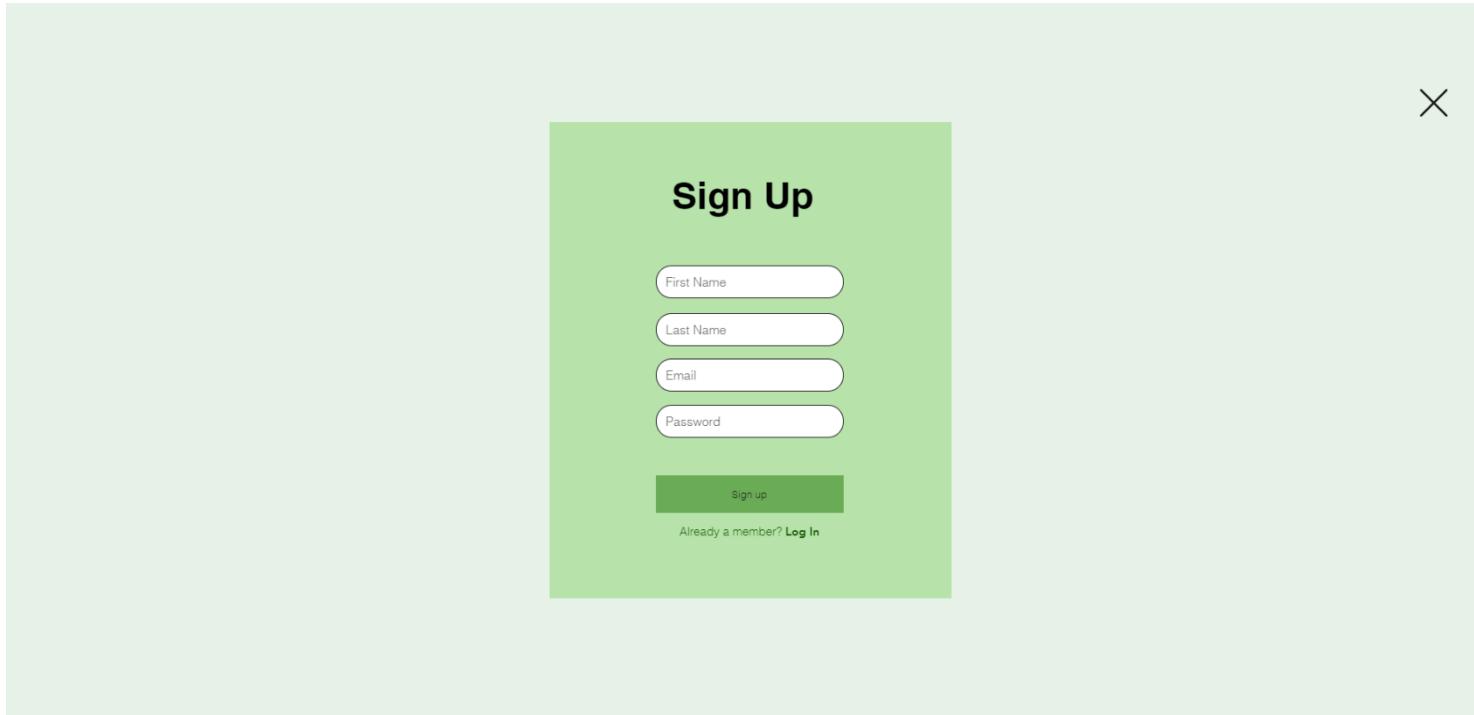


Figure 20

Firstly, it is worth noting that the products directory is provided by Wix (36). This is a basic directory for our designs and we intend to use a more complete directory for our final designs.

Throughout the designs in Figure 20, we have focused on implementing the results of our research to ensure optimal customer satisfaction and ease of use. For example, we have ensured each product card has an 'Add to Cart' button in order to eliminate the requirement for a user to go to each product page directly to select and add a product. This increases efficiency by a large factor, alongside the filtering and searching mechanisms implemented. Furthermore, Figure 21 shows a browsing mechanism that allows a user to browse items by category rather than by name. This allows users to locate items they may not necessarily know the name of, thus further increasing customer satisfaction. Lastly, there is also an easily accessible newsletter subscription form at the bottom of the page, in the footer, which is seen as a 'second chance to be convinced' (39). The increased sight of this form is likely to be correlated with more subscriptions, and subsequently more sales subject to the effectiveness of a newsletter scheme.

Design

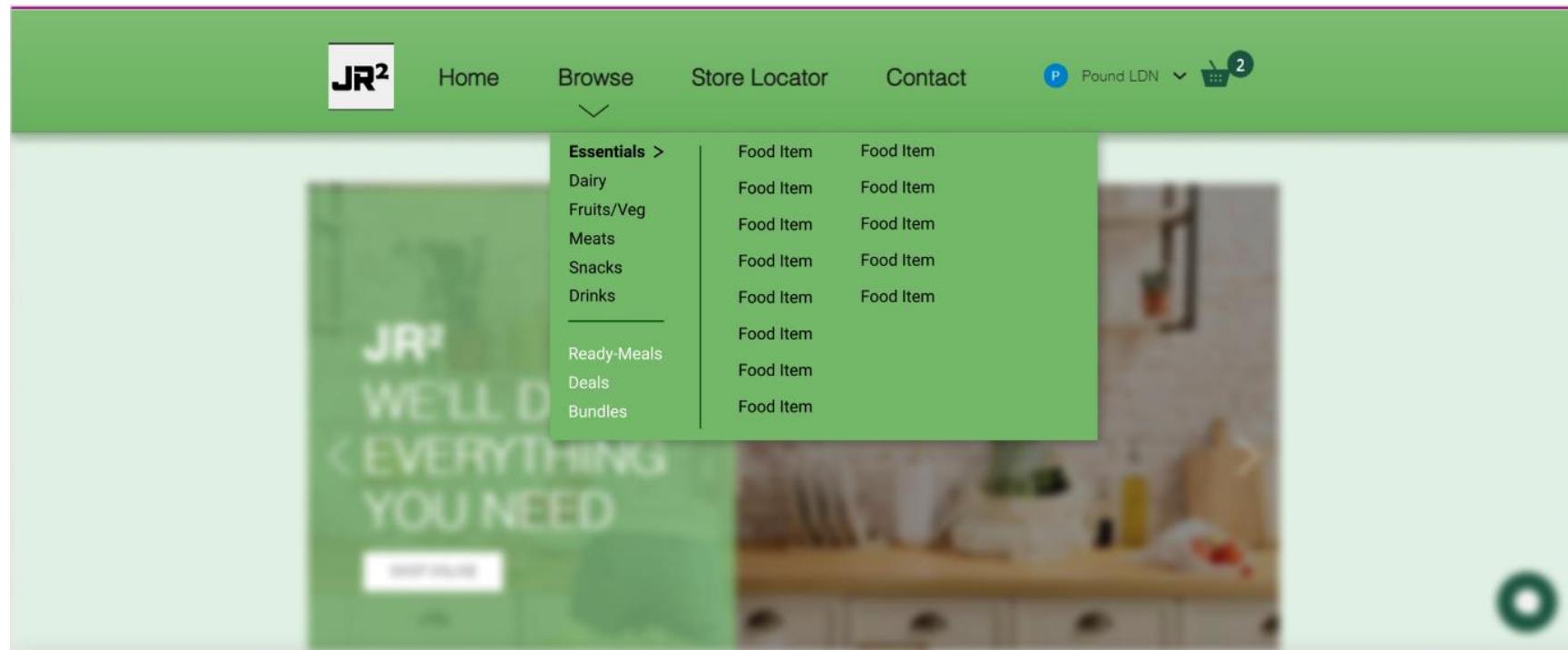


Figure 21

However, we recognise that this design is incomplete and requires attention to certain details to improve it from an aesthetic perspective, including but not limited to:

- **Store locator functionality:** this should allow users to locate their nearest stores based on their detected (or inputted) location. This functionality is subject to whether a company has physical stores.
- **Landing/Home page design:** following extensive review, we have decided that the home page requires a more welcoming feel, which can be achieved either by adding more images, using a background image, adding more vibrant colours or adjusting font sizes. These recommendations are based on our research pertaining to The Psychology of UX Design, more specifically the use of colour and the avoidance of over-simplicity in this scenario.
- **Product page:** adding nutritional guidance (which requires a products data source) will improve the informational quality of the page. A significant proportion of users will occasionally require nutritional information, and it is therefore imperative that this is provided.
- **Product card:** currently, the 'Add to Cart' button has a background matching the background of the container. We believe there is a requirement to introduce a contrasting colour to indicate success such that users can identify the button's function more easily.

These improvements will be difficult to make using Wix, as some of them are deep and technical and no members of our group is proficieint in Wix's programming language, Velo (formerly Corvid). We therefore considered using the designs we have created to build our designs (and following successful designs, a prototype) using the following configurations:

- HTML and C# (in the form of .cshtml files) will be used to build the user interface. Razor syntax facilitated by the .NET Core framework allows fluent transitions between the two languages to create powerful UIs which are efficient both in development and runtime.
- CSS will be used to style these web pages. Bootstrap 5 allows efficient development by assigning classes to HTML elements.
- JavaScript will be used to provide simple client-side animations and/or processes related to the user interface.
- C# (using the ASP.NET Core framework) to provide server-side functionality such as loading products from a database or through an HTTP request to fetch JSON data to populate the page.

Development

The prototype was created using the ASP.NET Core framework. It is composed of an ASP.NET Core Model-View-Controller (MVC) web application, and uses the following programming languages:

- **C#**: The model and controllers are coded in raw C#.
- **HTML**: Combined with C#, the pages are coded using Razor syntax which the server can translate to produce raw HTML. For example, Razor syntax allows us to use for loops which will repeatedly generate a certain HTML element based on the number of times the loop is repeated.
- **CSS**: We decided to use Bootstrap 5 as our CSS framework as R. Butrus has previous experience with Bootstrap that we found helpful. In addition to the default styling provided by the framework, we used SCSS and a SASS compiler to generate custom .css files to suit our needs. For example, Figure 22 shows how we added our light and dark shades of green (from our colour palette) to the default theme colours. This generates Bootstrap classes such as btn-lightgreen and bg-darkgreen.

```
$lightgreen: #E7F3E8;
$darkgreen: #2A6048;
$custom-colors: ( "lightgreen": $lightgreen, "darkgreen": $darkgreen );
$theme-colors: map-merge($theme-colors, $custom-colors);
```

Figure 22

- **JavaScript**: All client-side processes, including those using jQuery to power Bootstrap features such as the 'carousel', are written using JavaScript. For example, Figure 23 shows a function which makes an Ajax HTTP POST request to the server in order to update the quantity of a particular item.

```
function updateQuantity(prodid, quant) {
  $.ajax({
    type: "POST",
    url: "Browsing/AddToBasket",
    data: { "productId": prodid, "quantity": quant },
    dataType: "text",
    success: function (response) {
      location.reload();
    }
  });
}
```

Figure 23

The prototype is hosted by Microsoft Azure (40) and is available for viewing to the general public until the end of 11 July 2021. The code which powers the server is approximately four thousand lines long and we have made the decision not to make it available to the general public. **Appendix B** shows full-page screenshots of the final prototype.

Project scope

As a UX design project, the scope of the prototype is limited to front-end components only. However, some front-end components rely on back-end processes; hence there is a web server powering the prototype.

We decided the project scope should be limited to:

- Designing the following (responsive) web pages:
 - Landing page
 - Browsing/search page
 - Offers page
 - Product page
 - Basket page
 - Login page
 - Register page
 - Contact page
 - FAQs page
 - Terms & Conditions page
 - About page
- Coding the following functionality:
 - Providing product details to client
 - Adding/removing products from basket
 - Saving basket in session

We have thereby decided not to implement:

- delivery booking or scheduling
- customer management
- database-oriented tasks
- checkouts
- virtual aisles (due to its complexity and lack of importance/contributions)

Project structure

The project is composed of, broadly, models, viewmodels, views and controllers. Figure 24 shows the directory tree.



Development

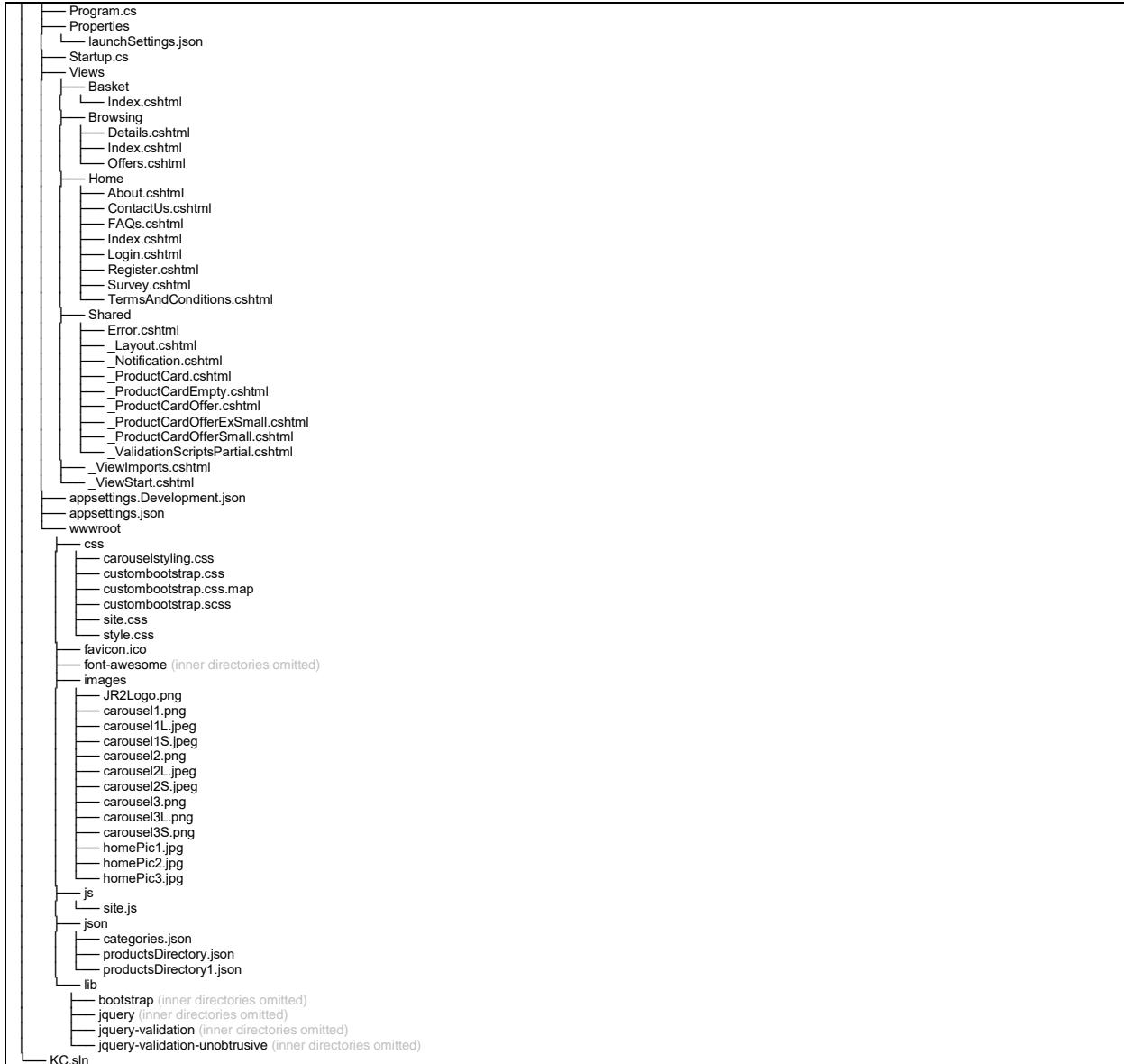


Figure 24

Layout page

The default layout for every page is defined in `_Layout.cshtml`. There are four notable features in this document:

- **Header:** the header is composed of two navigation bars. The topmost navigation bar contains the brand logo, several tabs, a profile icon and a basket icon with a superscripted badge displaying the basket item count. The 'Shop' tab contains a three-level browsing mechanism to allow the user to select one of the primary, secondary and tertiary categories. The lighter navigation bar underneath consists of a search form and a disclaimer warning; this is separated from the main navigation bar in order to avoid 'overpopulating' the header.
- **Footer:** the footer is formed of four columns. These are for shop-related links, opening hours, 'about' and a newsletter subscription form. On smaller devices, the footer is displayed as a 2x2 grid.
- **'Back to top' button:** when the user scrolls past their initial position on the page, a green button with an upward arrow is displayed in the bottom right corner. Clicking this button moves the user back to the top of the page as an alternative to manual scrolling.
- **Colours:** we have used three primary shades of green in addition to Bootstrap's built in 'success' theme colour. This has mainly been used with black and white writing throughout the website. Our extra focus on green relates to the connotations of freshness and environmentalism associated with it, which is highly likely to relate to a typical grocery shop's values and interests.

Landing page

The landing page is composed of:

- **Image carousel:** a set of three images along with clean, simple captions are automatically iterated through. Each image is styled with the property `filter:brightness(65%)` to maintain a contrast between the image and the white writing. There are small rectangular indicators at the bottom of the carousel to show which slide is active. In addition, there are forward/back arrow buttons to allow the user to manually iterate through the images should they wish to go back to check something that may have caught their attention. These actions can also be achieved by swipe gestures on touchscreen devices.
- **'Weekly Deals' carousel:** a set of twelve products are iterated through, four at a time. Due to the scope of this project, we do not find it necessary to moderate pricing, hence the prices displayed here are the original prices and the 'previous' price (shown in red) has been calculated by multiplying the original price by 1.2 and formatting appropriately. Users can also use regular swipe gestures to manually iterate through the slideshow.
- **Featurettes:** three featurettes, separated by featurette dividers, fill the remainder of the landing page. These have sufficient whitespace to allow for a clean, non-intimidating look and feel for the user. The use of rhetorical questions can engage the user further.

Basket page

The basket page is composed of two parts:

- **Products list:** five columns (image, product title, unit price, quantity and total price) whose sizes are adjusted based on screen size. In this design we incorporated sufficient whitespace to create a clean look and feel. In addition, there are easy-to-use 'steppers' for each product so that a user can comfortably edit their items' quantities. When this happens, instead of making a HTTP request to the server for a new page, it makes an asynchronous request from the JavaScript code so that there is no loading delay incurred. We used red writing to display multibuy discounts as this would stand out and act as a clear reminder to the user of how much money they have saved by shopping at this website.
- **Suggestions:** there are a suitable number of suggestions displayed on either the right or to the bottom of the basket (depending on screen size). These are generated by selecting, for each product in the basket, another product in the same category that is not currently in the basket. We acknowledge that there are more accurate ways of generating suggestions, however this would be the focus of backend developers and would deviate away from the scope of this project.

Contact page

It is always important to ensure that users can contact a grocery shopping website with ease should they have enquiries. It is therefore imperative that the contact page is simple to use. Our contact page is composed of two buttons (phone and email) as well as an online form (which sends an email to the company). The online form simplifies the process of sending an email in two main ways:

- It ensures the important information for the customer services team is provided by the user. The form ensures the user's name, email address and order number are entered before allowing the user to submit the form.
- By automating the process, it eliminates the need for the user to open their email application to manually send an email.

Product Page

The product page features the main information for each product. The product name and pricing have a larger font, as it is more important to the user than the other information such as the brand name and weight of the product.

A product image is also displayed on the left of the page. This improves the clarity of the page as it allows the customer to see the product visually, similar to if they were buying it in a physical store.

Below the price, which is displayed in bold to the right of the page, is a feature that allows the customer to add more than one of the specified item into their basket, so they do not need to click 'Add to Basket' each time. This is especially helpful for single items, such as fruits, to allow the user to purchase them in bulk quantities.

The nutritional information of the product is displayed in a light blue colour. This would be useful for customers that have an interest in their fitness or are curious about the

macronutrients of each product. In our prototype, this is a conceptual idea as the data feed used does not contain the nutritional information of any product.

Additional Features

Two other features that have been included in our product page, in order to improve the overall user experience is a 'back' button and a 'similar items' section. The 'back' button was included to optimize the simplicity of the website, as the user can utilise that button, rather than manually going back a tab via their internet browser (which is considered poor practice in UX design). The 'similar items' section is used to show customers several alternatives or additional products that they may be interested in. It mimics how a user would see several items of the same category on a single shelf at a physical store. The pricing is shown below each item so it can be compared to the main product being shown, as well as a 'buy' button, so the customer does not need to waste time on going into each product page just to add the item to their basket.

Browsing Page

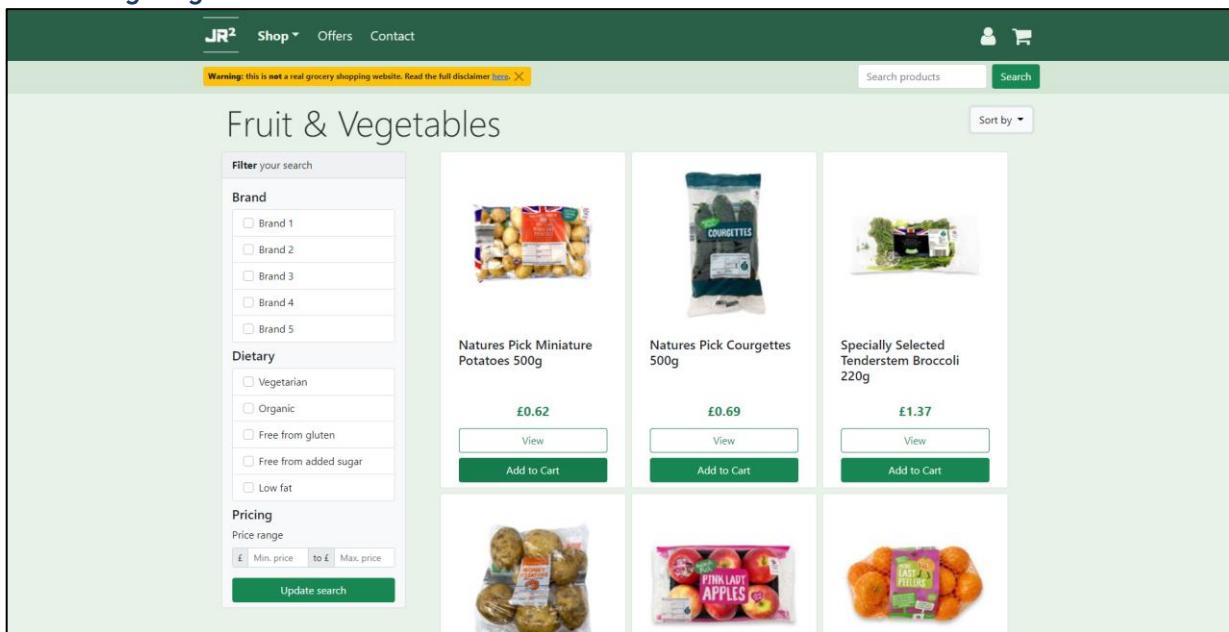
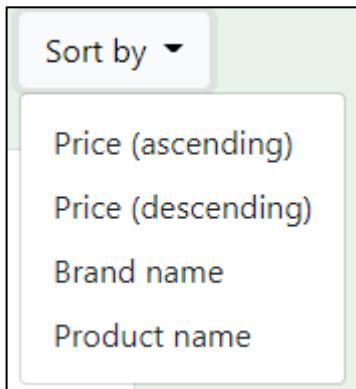


Figure 25

<div style="border: 1px solid #ccc; padding: 10px; background-color: #f9f9f9;"> <h3 style="margin: 0;">Fruit & Vegetables</h3> <div style="border: 1px solid #ccc; padding: 2px; margin-top: 5px; width: 100%;">Filter your search</div> </div>	<p>The browsing page allows relevant products to be displayed through the navigation panes (Shop > Category 1 > Category 2 > Item). The title at the top of the page displays the relevant category/item the user is viewing.</p>
<div style="border: 1px solid #ccc; padding: 10px; background-color: #f9f9f9;"> <h3 style="margin: 0;">Search results for fruits</h3> <div style="border: 1px solid #ccc; padding: 2px; margin-top: 5px; width: 100%;">Filter your search</div> </div>	<p>Users also have the option to find products through the use of searching bar at the top of the page, which conveniently also part of the scroll fixed header. This carries out a linear search on all the products and displays all products with the search result in their name.</p>

Development



Users are given the option to sort the items on display by 4 ways:

- Price (ascending) – displays products from the lowest in the price range to the highest.
- Price (descending) – displays products from the highest in the price range to the lowest.
- Brand name – alphabetically orders products based on their categorisation of brand.
- Product name – ordering products based on their name title.

The screenshot shows a search filter interface with three sections: "Brand", "Dietary", and "Pricing".
- **Brand:** A list of checkboxes for "Brand 1" through "Brand 5".
- **Dietary:** A list of checkboxes for "Vegetarian", "Organic", "Free from gluten", "Free from added sugar", and "Low fat".
- **Pricing:** A section for setting a price range with fields for "Min. price" and "Max. price" in £, separated by "to £", and a green "Update search" button.

Note: This feature is currently not functional but rather a conceptual idea

The filter mechanism provides the user with an easier way of filtering to a list of products of their liking.

Brand Selection

This lists all the brands of the products in the search. Users can choose products based on their trust in certain brands.

Dietary

This gives the customer an easily accessible method to ensure the products displayed satisfy their dietary requirements.

Pricing

This allows the user to set the maximum cost and minimum cost on the list of products they want displayed such that they are able to narrow down their search based on price.

Figure 26

Development

Login/Register Page

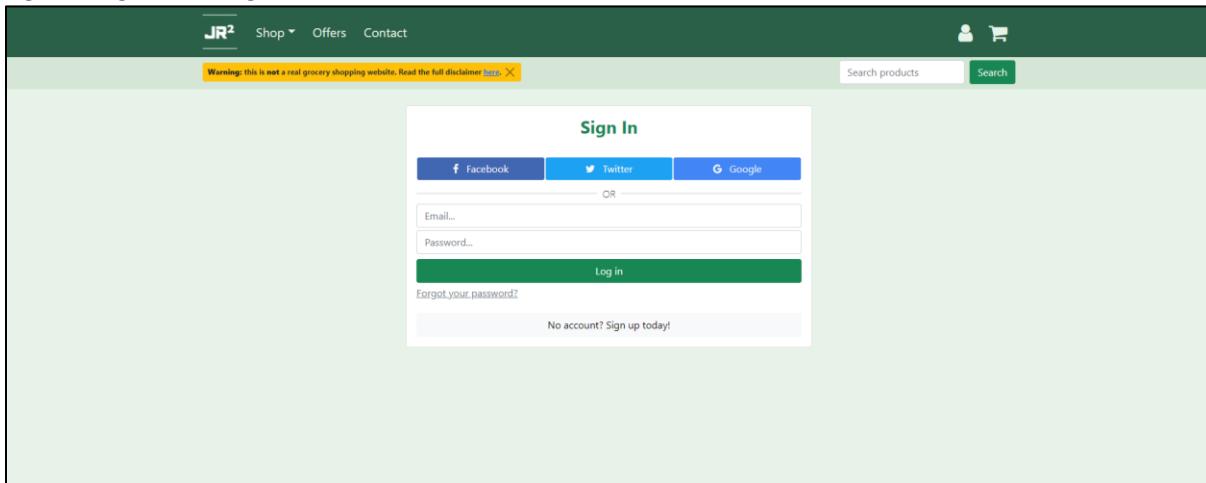


Figure 27

Due to data protection concerns and the need for a database, account creation functionality has not been implemented in our prototype. If we were to implement this, an ASP.NET Identity scaffolding would be required.

The login page has a simple layout and allows the user to sign on the website, in the form of many platforms including Facebook, Twitter and Google. This can be reached by clicking on the icon to the left of the trolley icon on the header.

A screenshot of a web browser showing the 'Register' page of a website. The header includes the logo 'JR2', navigation links for 'Shop', 'Offers', and 'Contact', and a user icon. A yellow warning bar at the top states: 'Warning: this is not a real grocery shopping website. Read the full disclaimer [here](#)'. Below the bar is a search bar with a magnifying glass icon. The main content area is titled 'Register' and features three social media sign-up buttons: 'Facebook', 'Twitter', and 'Google'. Below these buttons is the text 'OR'. There are four input fields: 'Email...', 'Password...', 'Confirm Password...', and a placeholder 'Already trying to register using...'. Below the input fields is a large green 'Register' button. At the bottom of the page is a light gray bar with the text 'Already a member? Sign in'.

Additionally, there is a feature to register for the website so the login function can be used. From this, customers are provided with better product suggestions.

Figure 28

Evaluation & Conclusion

Upon completion of our prototype, we conducted a survey amongst teachers and pupils at King's College London Mathematics School to evaluate the success of the website.

Aspect	Description
General aesthetic	How does the website look and feel? Do you think the idea of freshness is portrayed by the green colour scheme? Does it look like a user-friendly grocery shopping website? Have you tried it on mobile? Is it device-responsive?
General functionality	Does everything run smoothly? Are the links (e.g. product images) easy to click on?
Browsing	Does the multi-level navigation bar work well? Is it easy to find the category you are looking for?
Searching	Try a few searches - do you get what you are looking for? Does a mis-spelling get a spelling suggestion?
Basket functionality	Can you easily add an item to your basket? Is it easy to update your basket? Does the basket page function as intended?
Login/register pages	Try logging in or registering - does everything run smoothly? Are the specified social login links sufficient?
Contact page	Does it feel simple and easy to contact JR ² ? Is it easy to find the contact page?
Suggested products	Are the suggested products relevant to what you are looking at? Are there a reasonable number of suggestions?

Figure 29

Figure 29 shows how we decomposed the review process into eight ratings.

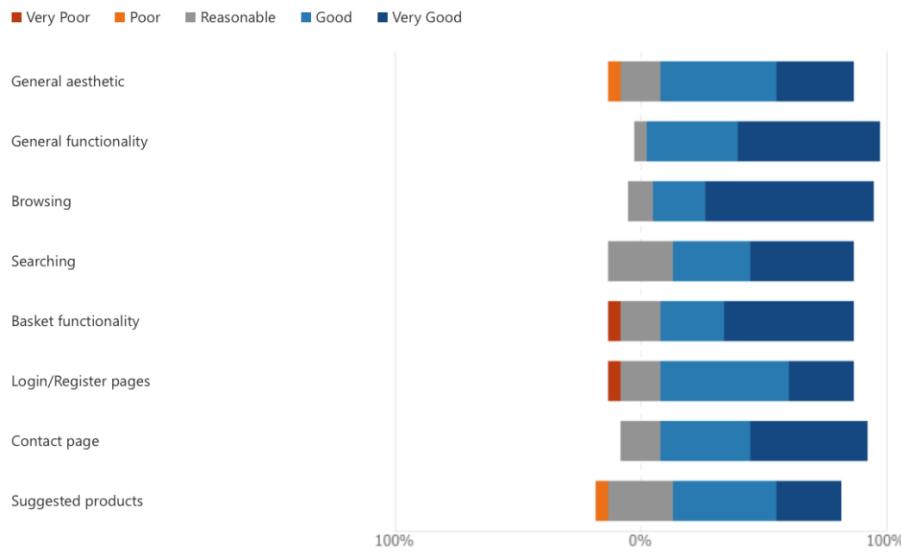


Figure 30

Figure 30 displays the responses to the 'rating' section of the survey. We found that on average, our browsing mechanisms, searching mechanisms and contact page were the highest-rated aspects of our website. We also noted that areas for improvement included the general aesthetic, basket functionality and login/register pages.

In order to identify specific tasks to improve the user interface, we provided an opportunity in the survey to submit details of problems which users encountered and suggestions they may have. The most notable set of improvements which we made as a result of this feedback includes:

- **Consistency with vocabulary:** in some parts of the website, it said 'Add to Cart', whereas in other parts of the website it said 'Add to Basket'. By changing all instances of the word 'cart' to 'basket', we ensured vocabulary uniformity.
- **Optimisation for mobile devices and other devices with small screens:** a small proportion of layouts, such as the product page, were not compatible with small screens. For example, Bootstrap columns were not adapted correctly to wrap content on large screens only. By adding CSS classes such as col-12 col-lg-3 to the main div containers, we were able to deliver an optimised experience for mobile users (as shown in Figure 31).
- **Misalignment of containers:** some containers were aligned such that their headers and body were not vertically in line with each other. For example, the 'Unfortunately, your search did not yield any results' container was centre-aligned contrary to the left-aligned 'Search results for {search term}' message. By adding CSS classes such as ms-0 to the incorrectly centered containers, these were realigned correctly (as shown in Figure 31).
- **Small search suggestions:** when one surveyee searched 'bannanas', they did not notice the 'Did you mean bananas?' suggestion at the bottom of the container. By containing these suggestions in rounded badges (Bootstrap badge rounded-pill classes, as shown in Figure 31) we added emphasis to them and hence increased the likelihood of a user seeing the suggestions.

Ultimately, we recognise that our completed prototype is not the most optimised online shopping website. For example, we were unable to integrate features such as 'virtual aisles' or artificial intelligence-led search suggestions due to the lack of time and facilities, both physically and financially. However, we believe this prototype would give rise to a successful online shopping store in its final state and it can easily be tailored to match the qualities and values of a given company.

Throughout this project we have developed several skills as a group which will benefit us in the coming years, including but not limited to:

- Using the Bootstrap library to create a professional-looking and responsive front-end.
- Using git and Github for version control and collaboration.
- Deploying web applications to Microsoft Azure via Microsoft Visual Studio.
- Working as a group to tackle a programming project.

Evaluation & Conclusion

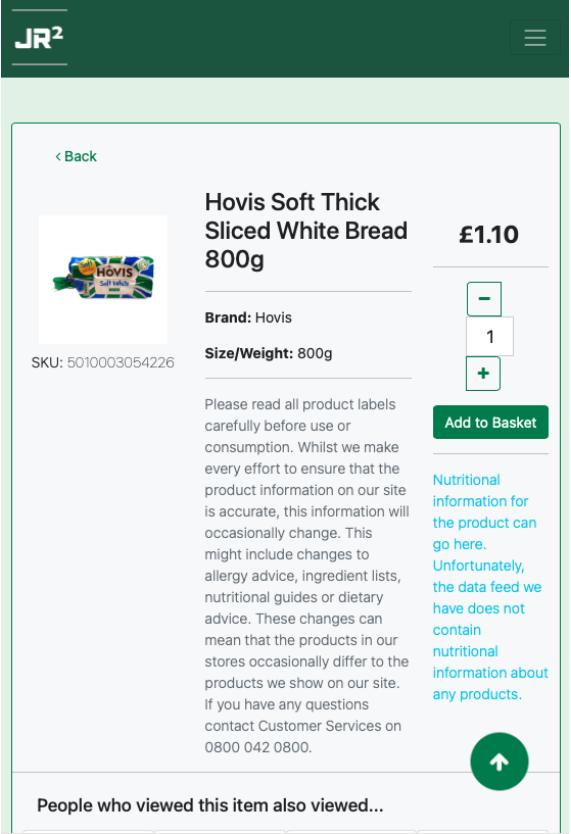
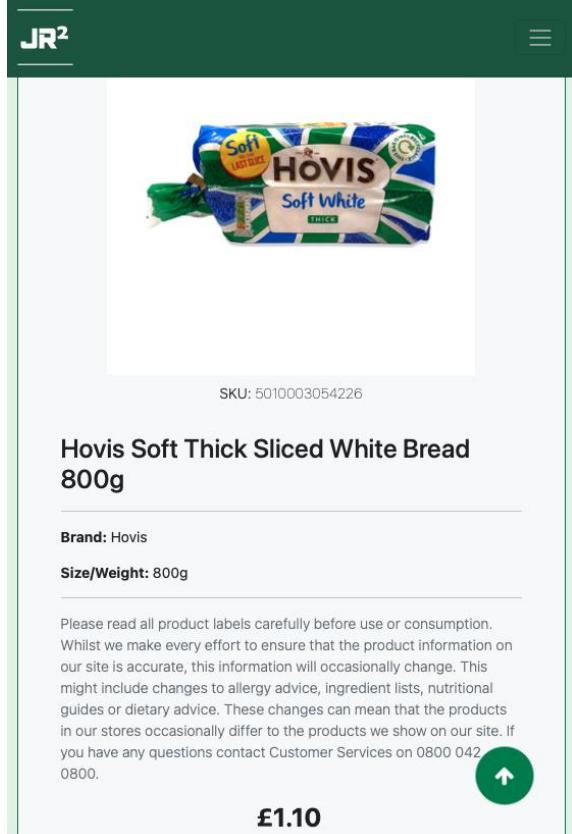
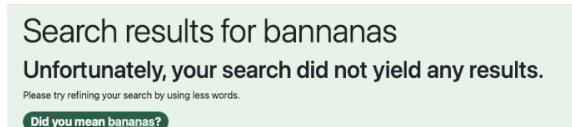
Pre-evaluation	Post-evaluation
 <p>Hovis Soft Thick Sliced White Bread 800g</p> <p>£1.10</p> <p>Brand: Hovis Size/Weight: 800g</p> <p>Please read all product labels carefully before use or consumption. Whilst we make every effort to ensure that the product information on our site is accurate, this information will occasionally change. This might include changes to allergy advice, ingredient lists, nutritional guides or dietary advice. These changes can mean that the products in our stores occasionally differ to the products we show on our site. If you have any questions contact Customer Services on 0800 042 0800.</p> <p>People who viewed this item also viewed...</p>	 <p>Hovis Soft Thick Sliced White Bread 800g</p> <p>£1.10</p> <p>Brand: Hovis Size/Weight: 800g</p> <p>Please read all product labels carefully before use or consumption. Whilst we make every effort to ensure that the product information on our site is accurate, this information will occasionally change. This might include changes to allergy advice, ingredient lists, nutritional guides or dietary advice. These changes can mean that the products in our stores occasionally differ to the products we show on our site. If you have any questions contact Customer Services on 0800 042 0800.</p>
 <p>Search results for bannanas</p> <p>Unfortunately, your search did not yield any results.</p> <p>Please try refining your search by using less words. Did you mean bananas?</p>	 <p>Search results for bannanas</p> <p>Unfortunately, your search did not yield any results.</p> <p>Please try refining your search by using less words. Did you mean bananas?</p>

Figure 31

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Appendices

Appendix A

```
////
/// @group settings/colours
////

/// Organisation colours
///
/// @type Map
///

/// @prop $organisation.colour - Colour for the given `$organisation`
/// @prop $organisation.colour-websafe - Websafe colour for the given
///   `'$organisation` . We use `websafe` to mean strong enough contrast against
///   white to be used for copy and meet the AAA (large text) and AA (smaller
///   copy) WCAG guidelines.
///
/// @access public

$govuk-colours-organisations: (
  "attorney-generals-office": (
    colour: #9f1888,
    colour-websafe: #a03a88
  ),
  "cabinet-office": (
    colour: #005abb,
    colour-websafe: #347da4
  ),
  "civil-service": (
    colour: #af292e
  ),
  "department-for-business-innovation-skills": (
    colour: #003479,
    colour-websafe: #347da4
  ),
  "department-for-communities-and-local-government": (
    colour: #009999,
    colour-websafe: #37836e
  ),
  "department-for-culture-media-sport": (
    colour: #d40072,
  )
)
```

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```
colour-websafe: #a03155
),
"department-for-education": (
    colour: #003a69,
    colour-websafe: #347ca9
),
"department-for-environment-food-rural-affairs": (
    colour: #00a33b,
    colour-websafe: #008938
),
"department-for-international-development": (
    colour: #002878,
    colour-websafe: #405e9a
),
"department-for-international-trade": (
    colour: #cf102d,
    colour-websafe: #005ea5
),
"department-for-transport": (
    colour: #006c56,
    colour-websafe: #398373
),
"department-for-work-pensions": (
    colour: #00beb7,
    colour-websafe: #37807b
),
"department-of-energy-climate-change": (
    colour: #009ddb,
    colour-websafe: #2b7cac
),
"department-of-health": (
    colour: #00ad93,
    colour-websafe: #39836e
),
"foreign-commonwealth-development-office": (
    colour: #012169
),
"foreign-commonwealth-office": (
    colour: #003e74,
    colour-websafe: #406e97
),
"government-equalities-office": (
    colour: #9325b2
```

Appendices

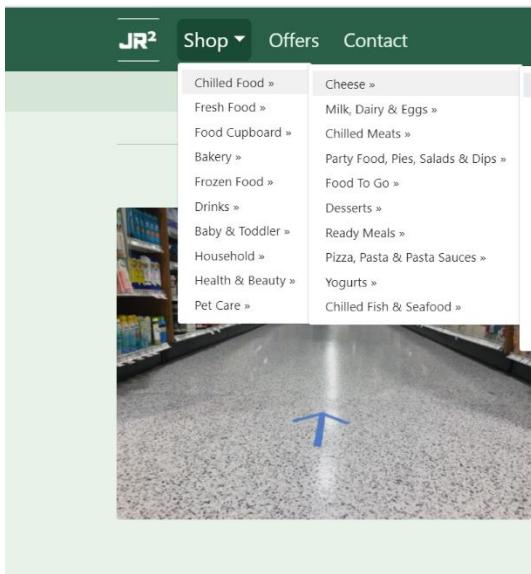
```
),
"hm-government": (
  colour: #0076c0,
  colour-websafe: #347da4
),
"hm-revenue-customs": (
  colour: #009390,
  colour-websafe: #008670
),
"hm-treasury": (
  colour: #af292e,
  colour-websafe: #832322
),
"home-office": (
  colour: #9325b2,
  colour-websafe: #9440b2
),
"ministry-of-defence": (
  colour: #4d2942,
  colour-websafe: #5a5c92
),
"ministry-of-justice": (
  colour: #231f20,
  colour-websafe: #5a5c92
),
"northern-ireland-office": (
  colour: #002663,
  colour-websafe: #3e598c
),
"office-of-the-advocate-general-for-scotland": (
  colour: #002663,
  colour-websafe: #005ea5
),
"office-of-the-leader-of-the-house-of-commons": (
  colour: #317023,
  colour-websafe: #005f8f
),
"office-of-the-leader-of-the-house-of-lords": (
  colour: #9c132e,
  colour-websafe: #c2395d
),
"scotland-office": (
  colour: #002663,
```

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```
colour-websafe: #405c8a
),
"uk-export-finance": (
    colour: #005747,
    colour-websafe: #005ea5
),
"uk-trade-investment": (
    colour: #c80651,
    colour-websafe: #005ea5
),
"wales-office": (
    colour: #a33038,
    colour-websafe: #7a242a
)
) !default;
```

Appendices

Appendix B



Shop ▾

- [Chilled Food »](#)
- [Fresh Food »](#)
- [Food Cupboard »](#)
- [Bakery »](#)
- [Frozen Food »](#)
- [Drinks »](#)
- [Baby & Toddler »](#)
- [Household »](#)
- [Health & Beauty »](#)
- [Pet Care »](#)

Search products **Search**

Cheese

- [Milk, Dairy & Eggs »](#)
- [Chilled Meats »](#)
- [Party Food, Pies, Salads & Dips »](#)
- [Food To Go »](#)
- [Desserts »](#)
- [Ready Meals »](#)
- [Pizza, Pasta & Pasta Sauces »](#)
- [Yogurts »](#)
- [Chilled Fish & Seafood »](#)

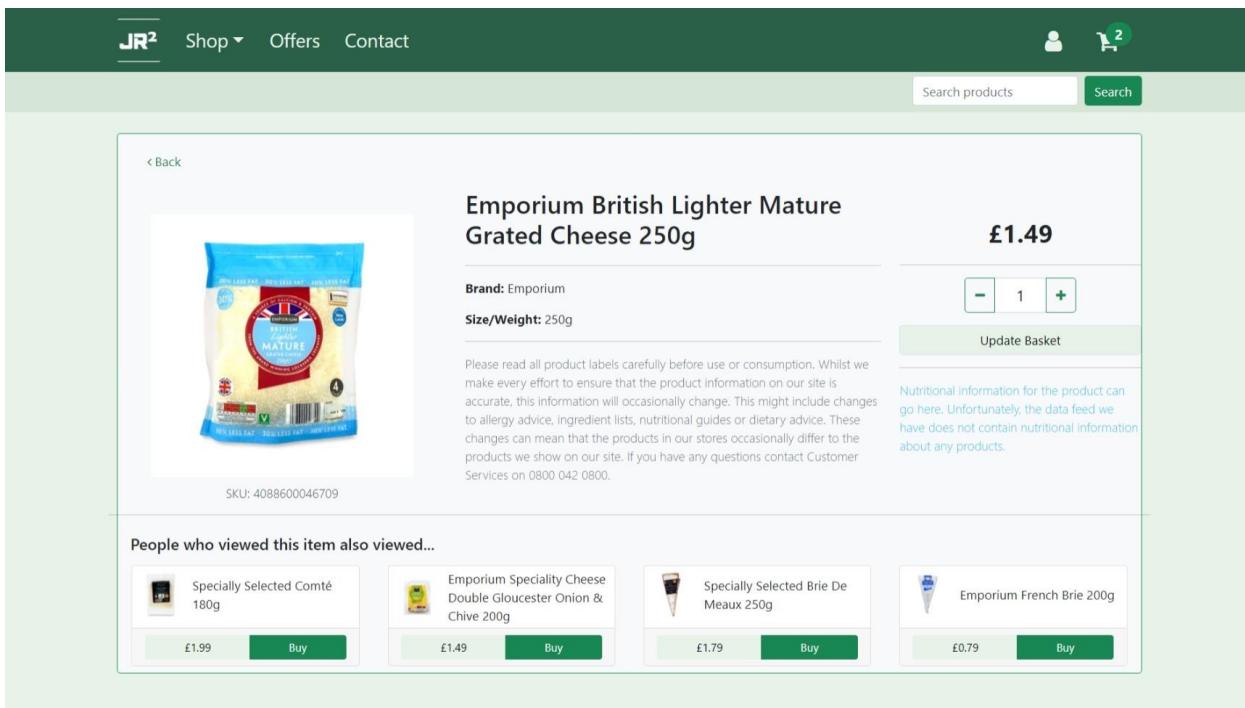
Cheese Snacks & Lunchbox

- [Cheddar & British Regional Cheese](#)
- [Grated Cheese](#)
- [Soft Cheese](#)
- [Speciality & Continental Cheese](#)
- [Hard Cheese](#)
- [Sliced Cheese](#)
- [Continental Cheeses](#)
- [Processed Cheese](#)
- [Other Cheese Products](#)
- [Cheese Alternatives](#)

Learn more

? We're all safe.

We're following government guidelines in order to protect our staff and customers. This includes intensive hand hygiene in picking facilities and more.



Emporium British Lighter Mature Grated Cheese 250g **£1.49**

Brand: Emporium
Size/Weight: 250g

Please read all product labels carefully before use or consumption. Whilst we make every effort to ensure that the product information on our site is accurate, this information will occasionally change. This might include changes to allergy advice, ingredient lists, nutritional guides or dietary advice. These changes can mean that the products in our stores occasionally differ to the products we show on our site. If you have any questions contact Customer Services on 0800 042 0800.

Update Basket

Nutritional information for the product can go [here](#). Unfortunately, the data feed we have does not contain nutritional information about any products.

People who viewed this item also viewed...

 Specially Selected Comté 180g £1.99 Buy	 Emporium Speciality Cheese Double Gloucester Onion & Chive 200g £1.49 Buy	 Specially Selected Brie De Meaux 250g £1.79 Buy	 Emporium French Brie 200g £0.79 Buy
--	--	--	--

STORE	OPENING HOURS	ABOUT	STAY UP TO DATE
Shop groceries Shipping & Returns Terms & Conditions FAQs	Mon - Fri: 7am - 10pm Sat - Sun: 8am - 9pm	This website is part of our King's Certificate project. Click here to find out more.	Subscribe to our weekly newsletter. <input style="width: 150px;" type="text"/> SUBSCRIBE

© JR² 2021

Appendices

Offers

Filter products

- Bread
- Deli
- Pasta
- Meat
- Fish
- Dairy
- Food
- Pricing

Sort by

Specially Selected Crispy & Delicious Beef Sausage Roll 350g	£2.69	Add to basket
Dashurst Smoked Chicken 300g	£2.49	Add to basket
Specially Selected Triple Berry Jack Cracker Biscuits 4 Pack	£0.99	Add to basket
Farm Dog Scratches + Gourmet 100g	£1.13	Add to basket
Roasted Almond Granola Apricots 200g	£1.55	Add to basket
Seasalt & Lime Biscuit Tin 6 Pack	£1.29	Add to basket
Added Extra Ready To Eat Chicken Liver 150g	£1.29	Add to basket
Inspired Gourmet Pata Negra Ham 100g	£0.85	Add to basket
Go-Days Biltong 100g	£0.41	Add to basket
Eat & Go Cheese Layered Party Salad 100g	£1.49	Add to basket
Specially Selected Naturally Smoked Bacon Strips 200g	£2.99	Add to basket
Imprebia Brie & Cheddar 400g	£1.79	Add to basket
Mosca Organic Russet Potato Rice 1kg	£0.49	Add to basket
Desert Moon Salads Gourmet Bites 250g	£1.79	Add to basket
Croissant Nut Pudding Sheet & Keweenaw 200g	£0.99	Add to basket
Indulgex CF Margarine 1kg 125g Pack	£2.55	Add to basket
Brookside Dark & Creamy Peach & Passion Fruit Yogurt 160g	£0.95	Add to basket
Food Service Meat Sticks In A Box 400g (48g Dressed)	£0.47	Add to basket
Nature's Park Large Flat Mushrooms 200g	£0.75	Add to basket
Wrigley Baking Soft & Chewy Biscuits 300g	£0.99	Add to basket
Nature's Park Large Lemon Drizzle Cakes	£0.74	Add to basket
Inspired Cuisine Chilli & Choclate & Choclate Honey & Pineapple Flavoured 300g	£1.49	Add to basket
Specially Selected Chilled Gourmet Ice Cream 100ml	£1.66	Add to basket
Savour Baker Sesame Chip Biscuits 250g	£0.59	Add to basket
Four Seasons Biscotti Haribo 300g	£0.59	Add to basket
Bimbo 3% Less Fat Sourdough 500g	£0.55	Add to basket
Nature's Park Cappuccino 300g	£0.69	Add to basket
Frederick's 10% Reduced Salt Roast Bacon 200g	£1.59	Add to basket
Aristed Farms 21 Day Old Cut Beef Steak 100g	£2.79	Add to basket
Hader Surprise Eggplant 60g	£1.58	Add to basket
Bricksters Barbecue Grilled Chicken Sausages 140g	£0.99	Add to basket
May & Baker Still Spring Water 4x2L	£0.83	Add to basket
Nature's Park Vegetable Mashes 240g	£0.95	Add to basket

STORE [Directions](#) [Opening hours](#) [Contact](#)

COMPLAINTS [Mail-in](#) [Email](#) [Report a problem](#)

ABOUT [About us](#) [Our food](#) [Our stores](#) [Our people](#) [Our values](#) [Our mission](#)

STAY UP TO DATE [Email address](#) [SUBSCRIBE](#)

© JR 2021

Up to your standard.

We pride ourselves in complete customer satisfaction – anything less and you'll get a refund.

[Learn more](#)

Weekly Deals

Take advantage of our time-limited offers today.

	Specially Selected Sundried Tomato & Buffalo Milk Mozzarella Mezzaluna 250g	£1.79	View	Add to basket
	Harvest Morn Red Fruit Benefit 375g	£0.95	View	Add to basket
	Freshcare 10 Unsmoked Back Bacon Rashers 300g	£1.39	View	Add to basket
	Eat & Go Ready To Eat Southern Fried Snackin' Chicken 60g	£0.59	View	Add to basket

Can't want to wait for the food delivery? You can come and get it.

At the checkout, you can choose to collect your order from your nearest store in as little as 60 minutes.

What's more, if you order before noon we can have it delivered the same day – how's that?

[Book a delivery slot](#)



Coronavirus? We're all safe.

All our services run in accordance with government guidelines in order to protect our customers and staff.

This includes no contact delivery, intensive hand hygiene in picking facilities and more.

[Learn more](#)

Price? We've got the lowest prices in the country.

Rest assured, JR² has the lowest prices you'll find. And if we don't, we'll match the price for you.

[Match a price](#)



STORE [Shop](#) [Process](#) [Shipping & Returns](#) [Terms & Conditions](#) [FAQs](#)

OPENING HOURS [Mon - Fri 7am - 10pm](#) [Sat - Sun 8am - 9pm](#)

ABOUT [This website is part of our King's Certificate project. Click here to find out more.](#)

STAY UP TO DATE [Subscribe to our weekly newsletter](#) [Email address](#) [SUBSCRIBE](#)

Sort by ▾

- Price (ascending)
- Price (descending)
- Brand name
- Product name

Appendices

JR² Shop ▾ Offers Contact  

Search products

Basket

Product Details	Price (each)	Quantity	Total price
 Specially Selected Meringue Nests 8 Pack	£0.99	- 1 +	£0.99
 Emporium British Lighter Mature Grated Cheese 250g	£1.49	- 1 +	£1.49
	Subtotal Multibuy discounts		£2.48 £0.00
	Total		£2.48

Similar buyers also bought...



Everyday Essentials Peach Slices In A Light Syrup 411g (250g Drained)
£0.31



Emporium 10 German Smoked Cheese With Ham Slices 200g
£1.49

STORE **OPENING HOURS** **ABOUT** **STAY UP TO DATE**

[Shop groceries](#) [Shipping & Returns](#) [Terms & Conditions](#) [FAQs](#)

Mon - Fri: 7am - 10pm
Sat - Sun: 8am - 9pm

This website is part of our King's Certificate project.
[Click here](#) to find out more.

Subscribe to our weekly newsletter.

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JR² Shop ▾ Offers Contact  

Search products

Search results for cheeese
Unfortunately, your search did not yield any results.

Please try refining your search by using less words.

Did you mean cheese?

STORE **OPENING HOURS** **ABOUT** **STAY UP TO DATE**

[Shop groceries](#) [Shipping & Returns](#) [Terms & Conditions](#) [FAQs](#)

Mon - Fri: 7am - 10pm
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This website is part of our King's Certificate project.
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Appendices

The screenshot shows the JR2 website's sign-in interface. At the top, there is a navigation bar with links for 'Shop', 'Offers', and 'Contact'. On the right side of the header, there are icons for user profile and a shopping cart. Below the header is a search bar with the placeholder 'Search products' and a 'Search' button. The main content area features a 'Sign In' form. It includes social media login options for Facebook, Twitter, and Google, separated by an 'OR' link. Below these are fields for email ('admin@jr2.com') and password ('*****'). A green 'Log in' button is at the bottom of the form, followed by a link to 'Forgot your password?'. At the very bottom of the page, there is a footer with sections for 'STORE', 'OPENING HOURS', 'ABOUT', and 'STAY UP TO DATE'. The 'STORE' section lists links to 'Shop.groceries', 'Shipping & Returns', 'Terms & Conditions', and 'FAQs'. The 'OPENING HOURS' section indicates 'Mon - Fri: 7am - 10pm' and 'Sat - Sun: 8am - 9pm'. The 'ABOUT' section mentions that the website is part of a King's Certificate project and provides a link to find out more. The 'STAY UP TO DATE' section encourages users to subscribe to the weekly newsletter, with a text input field for the email address and a 'SUBSCRIBE' button. The footer also includes the copyright notice '© JR² 2021'.

The screenshot shows a search results page on the JR2 website. At the top, there is a search bar containing the word 'cheese' and a green 'Search' button. Below the search bar, the results are displayed in a grid format. There are five items listed, each with a small image of the product on the left and its name on the right. 1. Emporium Kids 8 Lighter Cheese Triangles 140g 2. Emporium British Lighter Mature Grated Cheese 250g 3. Emporium Grated Mozzarella Medium Fat Cheese 250g 4. Emporium Full Fat Soft Cheese Original 200g 5. Crestwood 22 Mini Cheese & Onion Rolls 220g

Appendices

The screenshot shows the 'Frequently Asked Questions' section of the JR² website. At the top, there is a yellow banner with the text: 'Warning: this is not a real grocery shopping website. Read the full disclaimer [here](#). X'.

The main content area contains three collapsed FAQ sections:

- FAQ #1
- FAQ #2 (highlighted in green)
- FAQ #3

When FAQ #2 is expanded, it reveals the following text:

This is the answer to **Frequently Asked Question #2**.

At the bottom of the page, there is a footer with links to 'STORE', 'OPENING HOURS', 'ABOUT', and 'STAY UP TO DATE'. The 'ABOUT' section includes a note about the King's Certificate project and a link to find out more. The 'STAY UP TO DATE' section features a newsletter sign-up form with fields for 'Email address' and a 'SUBSCRIBE' button. The footer also includes the copyright notice '© JR² 2021'.

The screenshot shows the 'Contact' page of the JR² website. At the top, there is a yellow banner with the text: 'Warning: this is not a real grocery shopping website. Read the full disclaimer [here](#). X'.

The main content area features a heading 'Contact JR²' and a message: 'We're always here to help. You can contact us either by phone or email:' followed by two contact details:

- Phone: 0800 1234 567
- Email: info@jr2.azurewebsites.net

Below this, there is a note: 'Alternatively, you can send us a message through this form and a member of the team will get back to you within 24 hours.'

The contact form consists of four input fields: 'Your name' (e.g. Fred Bloggs), 'Email address' (e.g. fred.bloggs@example.com), 'Order number' (e.g. 10361457), and a large 'Message' field (e.g. Hi, my delivery has not arrived on time and I would like compensation.).

A 'Send message' button is located at the bottom of the form.

At the very bottom of the page, there is a footer with links to 'STORE', 'OPENING HOURS', 'ABOUT', and 'STAY UP TO DATE'. The 'ABOUT' section includes a note about the King's Certificate project and a link to find out more. The 'STAY UP TO DATE' section features a newsletter sign-up form with fields for 'Email address' and a 'SUBSCRIBE' button. The footer also includes the copyright notice '© JR² 2021'.