

Task B: Requirements Specifications and Prototype Implementation

Team 10

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Requirements

A website for a grocery store that includes a recommendation system. The design of the website will be up to us based on the sponsors' requests, and it will need a home page, products page, search bar, and a mechanism that allows consumers to add items to their basket. Each customer should be able to register an account and log in and out of it. The user should be able to search for items, browse products, add things to their basket, and receive recommendations for additional related or suggested products while browsing. The admin should be able to add and remove goods from the website, as well as add and delete categories and update products. This website should be dynamic, which means it should be linked to a database so that all of the items and recommendations are not hard coded into the website.

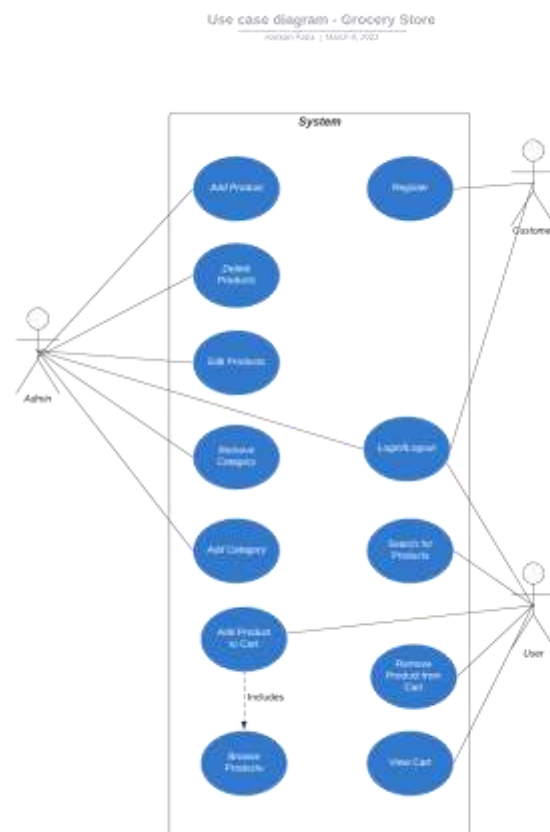
Actors, Use case and functions

Customer

- Register
- Login/Logout

User

- Login/Logout
- Search for Products
- Add Products to Cart which includes Finding Products



- Remove Products from Cart
- View Cart

Admin

- Login/Logout
- Update Catalogue
- Add Products
- Remove Products
- Add Category
- Remove Category
- Edit Products

Functional Requirements

- Registration and log in – users will be able to register and log in to have a personalised experience
- Search Bar – users can find products easier by using the search bar
- Cart – users can add and remove items to and from their cart
- Recommendation system – users' basket data will be utilised to recommend other items
- The website should not be static, the data, products and recommended items should all come from a database and not be hard coded.

Non-functional Requirements

A functional requirement is what something does and a non-functional requirement is how something does it. For our website, non-functional requirements could be:

- Usability – How easy is the website to use?
- Performance – How well does the website perform, does it meet all of the requirements and work as intended?
- Capacity – How many users can we have register?
- The process of adding to cart or placing an order.
- Serviceability – How easy is it for the admin to add/remove items and categories?
- Security – How safe is the data? does only the admin have admin access? and are the emails and passwords of users secure.

User Interface

The user interface of our website will to be similar to most other popular websites out there, this gives customers a sense of familiarity when using the website. We will aim to design a website that:

- Is visually appealing;
- Has a pleasing colour palette;
- Is easy to read and pleasant to look at;
- Has an uncluttered layout;
- Has a clear visual hierarchy that allows users to easily see where they are on the website;
- Will make use of design components that are recognisable to users so that they can perform their intended actions. E.g. making the register button green or the logout red.

All of the page templates were created with all of the functions that were deemed necessary.

Home Page

| | | | |
|---|----------------|------------------|------|
| Name/Logo | Navigation Bar | Login/Register | Cart |
| Header | | | |
| Search Bar | | Hierachical View | |
| | | | |
| Categories | | | |
| <div><div></div><div></div><div></div><div></div><div></div></div> | | | |
| Products | | | |
| <div><div></div><div></div><div></div><div></div><div></div><div></div></div> | | | |
| Footer | | | |

Login Page

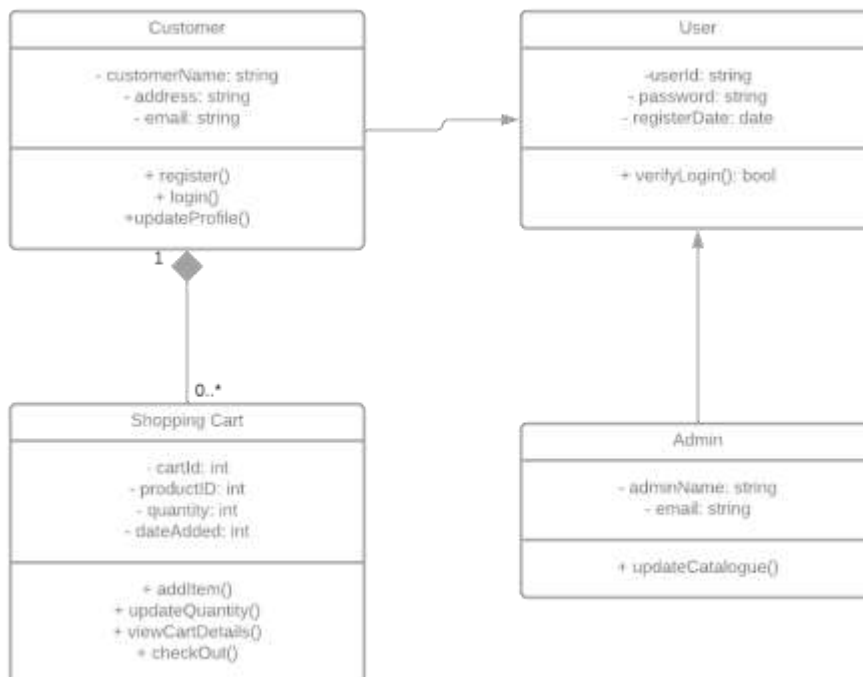
| | | | |
|--|----------------|----------------|------|
| Name/Logo | Navigation Bar | Login/Register | Cart |
| Header | | | |
| <div><div><div>Image</div></div><div><div>Member Login</div><div>Email</div><div>Password</div><div>Login</div><div>Don't have an account? Sign up</div></div></div> | | | |
| Footer | | | |

Registration Page

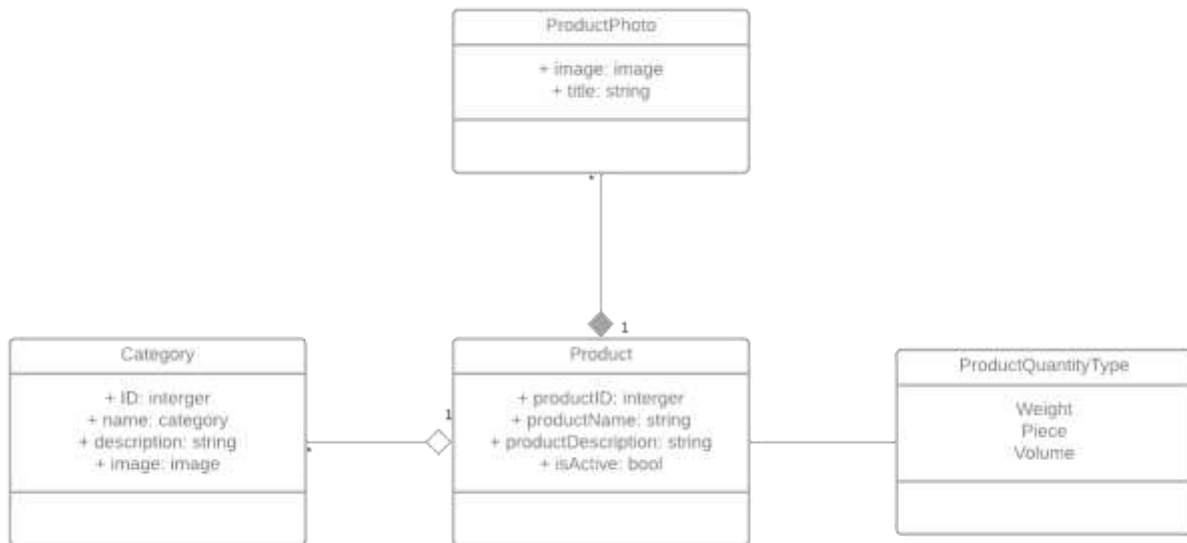


UML Class Diagrams

- Shopping Cart



- [Product](#)



[Legal issues](#)

With online shopping, there are some legal factors that need to be considered. For example, one legal factor with online shopping is the new occurrence of online sales taxes. If your store has a physical appearance, then retail owners will need to consider paying online taxes. Another legal issue is dealing with and handling liability and warranty claims. Retailers can be held liable for any product malfunction or if the product they sell causes illness or harm to an individual. As an e-commerce seller, it is the duty of the online shop to outline each product correctly and accordingly. Giving a simple description of a product may mislead customers and can cause harm to the business, leading to the business facing major consequences. In addition, neglecting this can leave an online business in a bad situation, leading to medical injury lawsuits and even being taken to court.

[Professional issues](#)

With every business, there are professional issues that need to be considered and dealt with correctly. One professional issue that needs to be put in place while the online business is running is maintaining confidentiality. Customers expect an agreement between them and the business to maintain confidentiality throughout the payment process when they shop online. Key information such as passwords, personal information, and any bank details must be kept safe for the benefit of the customer. Another professional issue is going against the code of conduct. In many major online platforms, this is an issue because businesses give the wrong product descriptions, which mislead customers into buying items. For example, a customer may decide to buy a toy for their kids. The product description says "toy," but when the customer opens the product, it is something completely different. This goes against the code of conduct.

Ethical issues

Ethical issues need to be considered when shopping online. These factors need to be considered when purchasing or making payments online. One ethical issue with online shopping is online privacy. Most electronic payment systems know the identity of a customer, so it is important to protect the identity of a customer. This is important because, let's say a customer visits the website and adds something to the basket, it is important that the customer feels comfortable with making a transaction online. This can only be done with the business ensuring that they have everything updated and have the best security in place. Relating to this, another ethical issue is privacy invasion. Key information such as usernames and passwords could be intercepted using malicious programs by hackers. This is done by websites using cookies to save key information like user passwords. Take on the ethical issues. Online grocery businesses need to ensure customers are safe while making payments and the right security is in place.

Economic aspects

The most fundamental of economic transactions—the buying and selling of goods—continues to undergo changes because of the growth of electronic commerce, which will have a significant influence on how corporations manage their supply chains. Simply put, e-commerce has changed the way business-to-business (B2B) and business-to-consumer (B2C) transactions are conducted, as well as the timing and technology involved. Pricing, product availability, transit habits, and consumer behavior have all been influenced in industrialized economies throughout the world. Ecommerce is rising at a breakneck speed, with revenues expected to top \$1 trillion by 2022 (Phaneuf, 2022). The present ecommerce atmosphere is fostering entrepreneurship and encouraging firms of all sizes to compete, with higher market share and fewer hurdles to entry than conventional brick-and-mortar commerce. Consumers choose e-commerce because of the convenience, value, and variety it provides.

Consumers flocked to their gadgets for groceries, fashion, and home furnishing purchases, so it's no surprise that ecommerce exploded in 2020. Because of the convenience of ecommerce and this shift in customer behavior, there was a higher demand for online shopping throughout the pandemic. Without the need for a genuine building to sell produce or items, it allows us to start up with less. Companies such as Ocado, which is a British online supermarket, have taken a similar approach and have established themselves, especially during the pandemic when going out to purchase necessary items was hard to do.

For an online shop to establish itself, it would help to have low costs to begin with, which has a great economic impact too. One can reach their customers far more due to the assistance in email subscriptions that customers sign up for when they create an account. Offers can be sent to them and reduce the need for pamphlets, leaflets, or, in some aspects, advertising of such offers which are on currently. The utilization of online shopping reduces the cost of transaction by removing barriers in relation to geography and time, which is what both customers and businesses face. Products are available to view and purchase at any time during the day without

an opening and closing time, which maximizes sales and customers' ability to view and purchase items whenever they please.

Risks

Despite the fact that there are several advantages to online shopping, it does not appear to be as appealing as it is. There are hazards that must be avoided. To start an internet business, we must guarantee that these risks are managed in order to avoid future difficulties and allow the firm to thrive without glitches.

Privacy and Security

One of the most serious issues is data privacy and security risks. Hackers are becoming more sophisticated by the day. Malicious actors are finding it easier to break into systems from within, gaining employee credentials through phishing or spreading malware and ransomware via false email links. The average cost of a data breach is \$4.24 million, but reputational damage may be greater. The best way to prevent such a risk from occurring is to implement data privacy and an online security policy. Employees must be trained in this area, and two-factor authentication must be implemented to further protect the business.

Unauthorized Access

It is critical that only the necessary employees have access to the website. What appears on the website in terms of content, products, and sale prices, among other things. These are all important factors that can have an impact on the business, so ensuring that product prices, images, and so on are not altered is critical. Employee access should be restricted, two-factor authentication should be implemented, and passwords should be changed on a regular basis to avoid such a situation.

Human error

Humans are prone to making mistakes. In some cases, a file or important information may be accidentally deleted, which can be disastrous. To avoid this, we can use a backup or recovery solution to create a backup of the deleted data or files.

Bad CVS files

CVS files are frequently used to input data into them, which is then transferred to the database. However, errors may be visible, and it is critical to ensure that these files are free of errors that could affect products, prices, and product descriptions. This risk would be avoided by checking each record in the database and employing data validation, which may also aid in error reduction.

Adhering to laws and legislation

The prospect of starting a business online is exciting, but the laws that are in place must be followed. This is necessary to ensure that the company is not breaking any laws that they are not expected to break. Data protection is one of the most important laws that a company is responsible for enforcing. GDPR applies to all businesses, and we, as an online business, must

comply with it. We must also update our websites to ensure that they are compliant with these rules.

Environmental Impact

Online shopping has transformed the retail industry and the way customers shop. Businesses used to need a physical location to display and sell their products, but now they can do so via the internet. This is supported by data, which shows that there are 256 million online shoppers in the United States alone, with that number expected to rise by 22 million by 2024. (Collins, 2021). However, there are both advantages and disadvantages to establishing our online website in terms of environmental impact.

Harmful emissions

An online shop's business model enables transactions to be conducted without the need for a physical presence at a location. By doing so, we can work from home and reduce carbon emissions, which are harmful to our environment.

Wastage

As information is transferred digitally, physical paper becomes obsolete. We can transfer data online, eliminating the need for paper and further reducing our carbon footprint.

Digital Storage

Having information online allows for the elimination of warehouses and the creation of products on demand. Using the ideal business model, we do not need a warehouse, reducing our carbon footprint even further. It is well understood that warehouses require a lot of land to build, as well as a lot of carbon emissions and material waste. Furthermore, lorries transporting products from the warehouse will exacerbate environmental problems. This causes truck damage and noise pollution on the roads.

However, there are some obvious negative effects of environmental factors.

Transport emissions

Despite the fact that e-commerce business strategies limit the number of transportation emissions released into the air by their employees, delivery trucks can still emit significant amounts of hazardous pollutants. Due to the immediacy of online shopping, such as Amazon Prime vehicles, lorries frequently leave their warehouses half full.

Packaging

All products have packaging and require additional packaging in order to be shipped. The excessive use of cardboard and Styrofoam results in the increased use of packing materials and the filling of landfill sites.

Returns

Customers frequently return products, resulting in increased transportation emissions and packaging waste. The need for products to be returned may be due to customer dissatisfaction, so the amount of transportation required doubles. Because packaging is frequently torn open, it cannot be reused, adding to the waste produced, which is often the paper labels, cardboard boxes, and plastic bags.