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Part 1: Business Process Analysis

Task 1: Introduction

Tesco Plc is the largest food retailer in the United Kingdom and is one of the major British retailers, ranking third behind Walmart in the United States and Carrefour in France in the retail industry. It sells roughly 4000 different culinary items (Euromonitor, 2010).

Tesco has expanded globally since the early 1990s, with operations in 11 other countries in the world (Wikipedia, 2022). The company pulled out of the US in 2013, but as of 2018 continues to see growth elsewhere (Wikipedia, 2022). Since the 1960s, Tesco has diversified into areas such as the retailing of books, clothing, electronics, furniture, toys, petrol, software, financial services, telecoms, and internet services (Wikipedia, 2022). In the 1990s Tesco repositioned itself from being a downmarket high-volume low-cost retailer, attempting to attract a range of social groups with its low-cost "Tesco Value" range (launched 1993) and premium "Tesco Finest" range (Wikipedia, 2022).

Since Tesco is well established and locally well known, an industry this big took a big hit due to the pandemic. According to the Balance sheet of Tesco PLC on Yahoo Finance, Tesco's assets were in a constant increase from 2018-2019-2020 (Yahoo Finance, 2022). But in 2021, it took a great hit by a loss of 13.304% (Yahoo Finance, 2022). Tesco has a large presence in West Europe (accounting for 78.4% of sales in 2019) and the severe impact of COVID-19 in this region causing stockpiling early on, has driven sales for the grocer (AP News, 2021). To cope with swelled demand for online grocery, Tesco has mobilized its logistic network in the UK and increased the number of delivery slots it offers.

Task 2: Justification of Tools and Techniques

For Strategy analysis, we are going to use Michael Porter's Five Forces Model accompanied by the Resource Audit. The reason to choose Michael Porter's Five Forces model is because it gives a business analysis model that helps to explain why various industries are able to sustain different levels of profitability. It helps to figure out the weakness and shortcomings in strategy as well as helps in figuring out various factors which can influence decisions in an organization like Tesco (Scott, 2022). On the other hand, PESTEL or PESTLE provides a macro picture of an industry environment (The University of Sydney, 2022).

For Investigate situation, we are going to use Rich picture and Data Flow Diagram (DFD) context diagram. A Rich Picture is a way to explore, acknowledge and define a situation and express it through diagrams to create a preliminary mental model. A rich picture helps to open discussion and come to a broad, shared understanding of a situation. Whereas, DFD diagram explains the overview of the system without indulging in the various process involved in the system, which makes it easier to understand.

For consider perspective, CATWOE, and Power/interest grid will be used as tools. CATWOE is a technique that provides a framework for defining and analysing business stakeholder perspectives. The CATWOE technique allows you to investigate each stakeholder's perspective individually and capture this information (Improvement Service, no date). Whereas a power-interest grid is a technique used to categorize stakeholders based on their power or influence and interest in a project (Improvement Service, no date).

For Analyse needs, we are going to use Decision Tree and UML use case diagrams. Decision trees are used to create a better understanding of conditions and actions. An industry as big as Tesco will need a better distinction where the sequence of conditions and actions match.

For define requirements, we have used DFD and UML Class and Sequence diagrams for describing processes and various classes. UML diagrams are used for visualization purposes and are extensively used for business modelling.

Task 3: Analysis

In this section, we are going to analyse the selected industry i.e. Tesco with the help of different tools giving us various insights.

3.1 Strategic analysis for Tesco

3.1.1 Michael Porter's Five Force Model

Porter's Five Force Factors	**Intensity**
Competitive rivalry within the industry	Moderate to High
Bargaining Power of Buyers	High
Threats of New Entrants	Low
Bargaining Power of Suppliers	Low to Moderate
Threat of Substitute Products	Low

Table 1: Michael Porter's Five Forces Model

3.1.1.1 Competitive rivalry within Industry

The intensity of competitive rivalry within the industry is moderate to high for Tesco because of the community's increased need and supply of commodities to meet fundamental necessities. As a result of this growth, a number of groups and corporations have seized the market in order to give multiple platforms for clients to purchase from, resulting in severe competition among the established players. Tesco is the consistent market leader in terms of grocery market share with a 27 percent share as of December 2020 followed by Sainsbury's with 15.7%, ASDA with 14.1%, Morrisons with 10.3%, ALDI with 7.7%, and The Cooperative with 6.3%. As a result, the presence of such well-known names in the sector makes the operating atmosphere more competitive.

3.1.1.2 Bargaining Power of Buyers

The intensity of the bargaining power of buyers is high because of the availability of the various vendors and the buyers can buy the products from wherever they like. On top of it, the prices are comparable hence the buyer has a significant amount of power here. Customers' awareness of product prices and offers has increased as a result of online channels, which influences customer purchasing behaviour. Hence it is hard to predict customer behaviour.

3.1.1.3 Threats of New Entrants

Looking as much Tesco has established in the past few decades, a newcomer retailer is very less likely to be a threat to Tesco. Hence the intensity of this threat is low. It might be a moderate threat to other retailers with new entrants considering a few factors as convenient accessibility, locality, specialty, etc.

3.1.1.4 Bargaining Power of Suppliers

The intensity of bargaining power of the suppliers is low to moderate since Tesco has a vast number of suppliers, so it can choose from whichever the supplier is giving the product cheaper with fewer efforts. Hence the supplier does not have much of an option and the intensity decreases of a supplier. A high number of vendors fight for a limited amount of space in retail stores. The increased supply capacity makes it challenging for suppliers to have an effect on the successful growth of the company, which allows them to hold specific authority over them. Thus, the bargaining power of suppliers is kept low to moderate.

3.1.1.5 Threat of Substitute Products

Tesco provides a wide choice of products to its clients. It also sells products that are alternatives for the majority of the items. If there are substitutes for Tesco products, they are either of poor quality or of great quality with a hefty price tag. Therefore, the intensity of the threat of substitute products is low.

3.1.2 Resource Audit:

A resource audit is a strategy analysis technique that is used to investigate both tangible and intangible resources (Vliegenthart, 2021). The results of a resource audit serve as a starting point for forming strategy, initiating change, or developing products and services. Tangible resources are further classified into Physical Resources, Financial Resources, and Human Resources (Vliegenthart, 2021).

3.1.2.1 Physical Resources:

- Currently, 4,673 stores are operational worldwide out of which 4,008 are across the UK (Blázquez, 2021).
- 23 warehouses across the UK (Rahman, 2020).

3.1.2.2 Financial Resources:

- In the financial year of 2021, Tesco's annual revenue amounted to 53.17 billion British pounds in the United Kingdom and the Republic of Ireland (Tesco PLC, 2022).
- Whereas, Tesco's international annual revenue amounted to 4.71 billion British pounds (Tesco PLC, 2022).

3.1.2.3 Human Resources:

- 367,361 employees across the globe (Blázquez, 2021).

3.1.2.4 Intangible Resources:

- 6th most valuable brand in the UK (Statista, 2021)
- Top in the grocery market share in the UK (Statista, 2021)
- 4th leading food and beverage retailer in Europe in 2020 (Retail Index, 2020)

3.2 Investigate Situation:

Investigate situation is concerned with uncovering problems and issues. This section will tell us an overview of how Tesco works and overcome any obstacles. We will be using Rich Picture and DFD context diagrams.

3.2.1 Rich Picture:

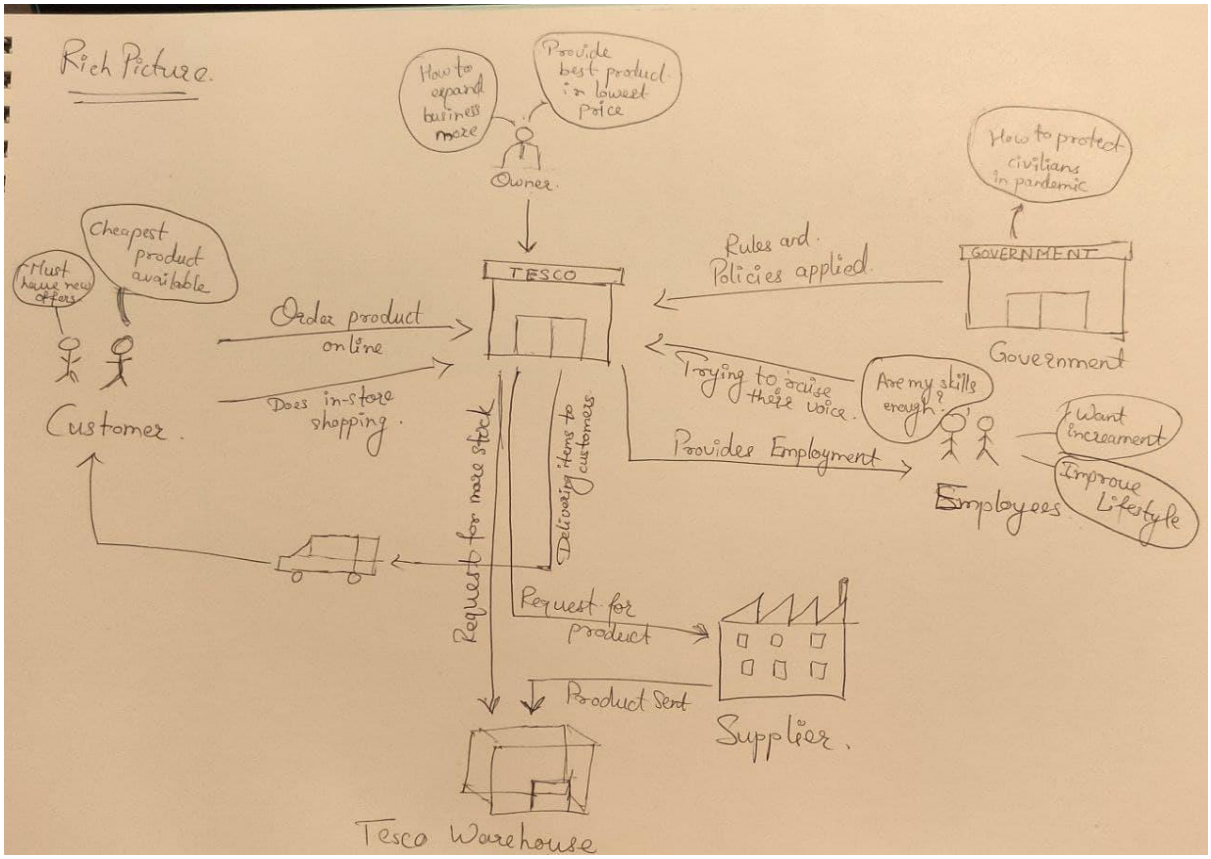


Figure 1: Rich Picture of Tesco

A Rich Picture is a way to explore, acknowledge and define a situation and express it through diagrams to create a preliminary mental model (Stevens, 2020). A rich picture helps to open discussion and come to a broad, shared understanding of a situation (Stevens, 2020). The description of the situation is depicted as a picture using diagrams, symbols, cartoons, and words, it can be drawn by hand or electronically. Here, the situation is the delivery of products due to many customers still do not want to take risk of getting infected by Covid. In this rich picture, the stakeholders shown include Government, customers, owners, suppliers.

3.2.2 DFD Context Diagram:

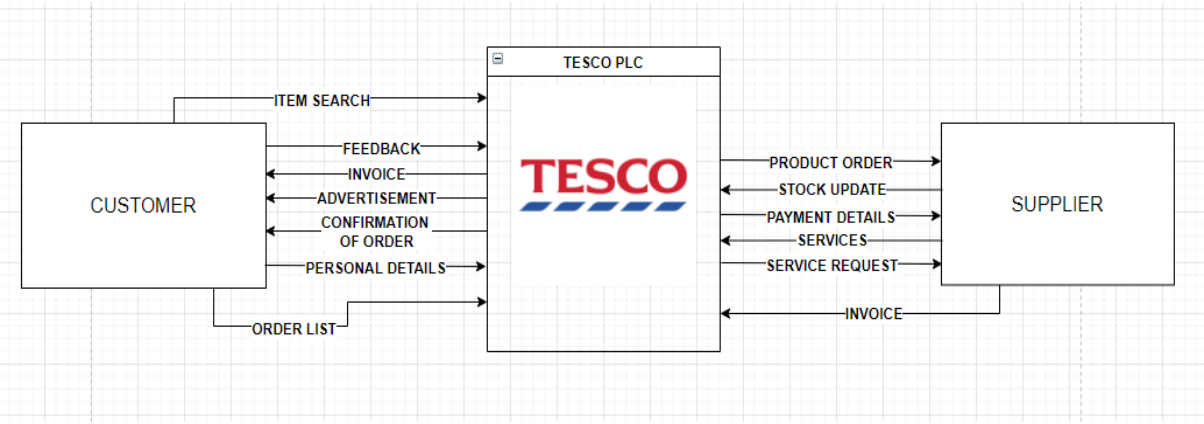


Figure 2: DFD context diagram of Tesco

A data-flow diagram (DFD) is a way of representing a flow of data through a process or a system (Wikipedia Contributors, 2021). The DFD also provides information about the outputs and inputs of each entity. In this case, customer and supplier are two external entities described here (Wikipedia Contributors, 2021). The DFD here gives a brief idea of how Tesco as a retailer deals with customers and its supplier. Here it is shown in a brief manner how a customer can order the product(s) online through the Tesco website and how Tesco orders its supplies from the supplier.

3.3 Consider Perspectives:

In this section, we make the perspectives of the stakeholders and how to deal with them. Stakeholders can support or resist change, they can clarify or confuse requirements, and they have knowledge that the analyst needs to acquire. For this, we will be using CATWOE and Power/interest grid tools.

3.3.1 CATWOE:

CATWOE is a technique that provides a framework for defining and analysing business stakeholder perspectives. The mnemonic stands for Customer, Actor, Transformation, Worldview, Owner, and Environment.

CATWOE	Supplier	Customer	Government	Employee	Owners
Customers	Supplier, Tesco PLC	Customer, Tesco PLC	Customers, Government, Tesco PLC	Employee, Tesco PLC	Owners

Actors	CEO, workers, clients, customers	Salesman / Saleswoman, Customers	Government, CEO, workers, customers, clients	Employee, Tesco PLC	Owners
Transformation	Supply best products efficiently and less time consuming	Find cheapest products with fewer efforts and nearby location	To provide the best service in the vicinity for the people living around	To provide the necessary skills so that organization can run properly	Provide best products at the lowest price
Worldview	To make a profit and increase the business	Take advantage of the offers	To get the recognition for providing the services which are suitable for the people	Increment in salary and recognition and promotion in the organization while earning experience	Brand recognition, business expansion, gain profit
Owners	CEO	Customer	Government authorities	CEO of Tesco PLC	Owners
Environmental	Available capacity, budget	Buy products within the budget and capacity	Check and approve the best applicable services helpful to people	To improve the lifestyle and complete personal needs	Flourishing business while keeping customers happy

Table 2: CATWOE analysis of Tesco

For using CATWOE, we need to identify the stakeholders. Now the stakeholders can be internally or externally related to Tesco. In the above CATWOE, we selected Employee and

the owner as internal stakeholders of Tesco. Whereas, supplier, customer, and government are the external stakeholders which affect Tesco sales directly or indirectly. Together these five are the key stakeholders of Tesco and above CATWOE shows their perspective related to Tesco.

3.3.2 Power/Interest Grid:

In order to successfully run a publicly-traded company, one should know how to keep their stakeholders happy. Stakeholders are the key part of any industry or organization. CATWOE analysis helps us to find the perspective of stakeholders. With the help of the power/interest grid, we can prioritize our stakeholders accordingly.

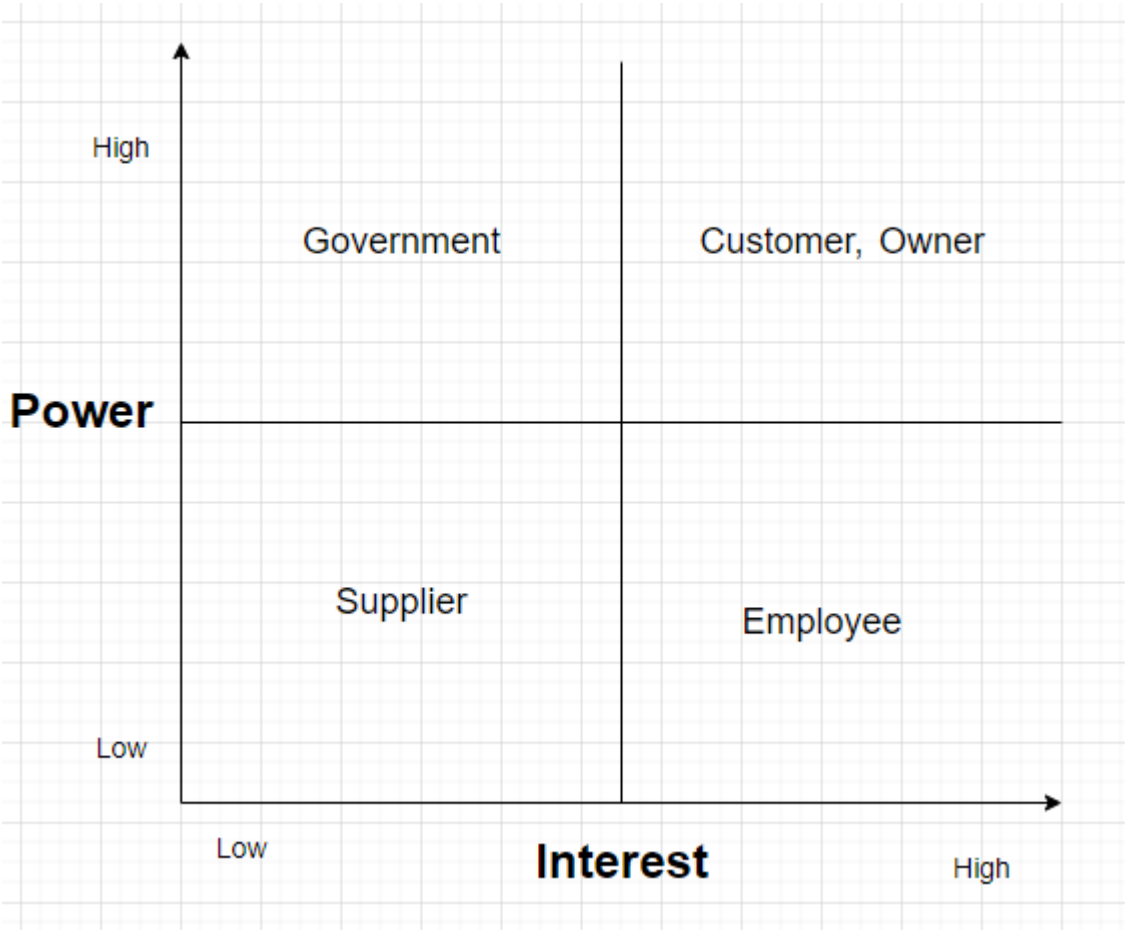


Figure 3: Power/Interest Grid Analysis for Tesco

Here, we have taken the same stakeholders used in CATWOE analysis as well. The power/interest grid given above is divided into four sections (Bdaiwi2017):

1. High Power/ High Interest (Top priority): These are the stakeholders who are decision-makers and have the biggest impact on the project success and hence must closely

manage their expectations. Here, in this scenario, the customer and owner fall in this category (Bdaiwi2017).

2. High Power/ Low Interest (Keep satisfied): These are the stakeholder needed to be kept in the loop, these stakeholders need to be kept satisfied even though they aren't interested because they yield power. For this section, from our stakeholders, the Government falls in this category (Bdaiwi2017).
3. Low Power/ High Interest (Keep informed): Keep these people adequately informed, and talk to them to ensure that no major issues are arising. These people can often be very helpful with the detail of your project. For this category, the employee is the stakeholder with such privileges (Bdaiwi2017).
4. Low Power/ Low Interest (Monitor): Monitor these people, but do not bore them with excessive communication. For this category, the supplier is considered since the current company changes and regulations do not affect them at all but they are necessary for the supplies (Bdaiwi2017).

3.4 Analyse Needs:

In this section, we will be using Decision Tree and UML use case diagrams for analysing the needs of Tesco.

3.4.1 Decision Tree:

A decision tree is a decision support tool that uses a tree-like model of decisions and their possible consequences.

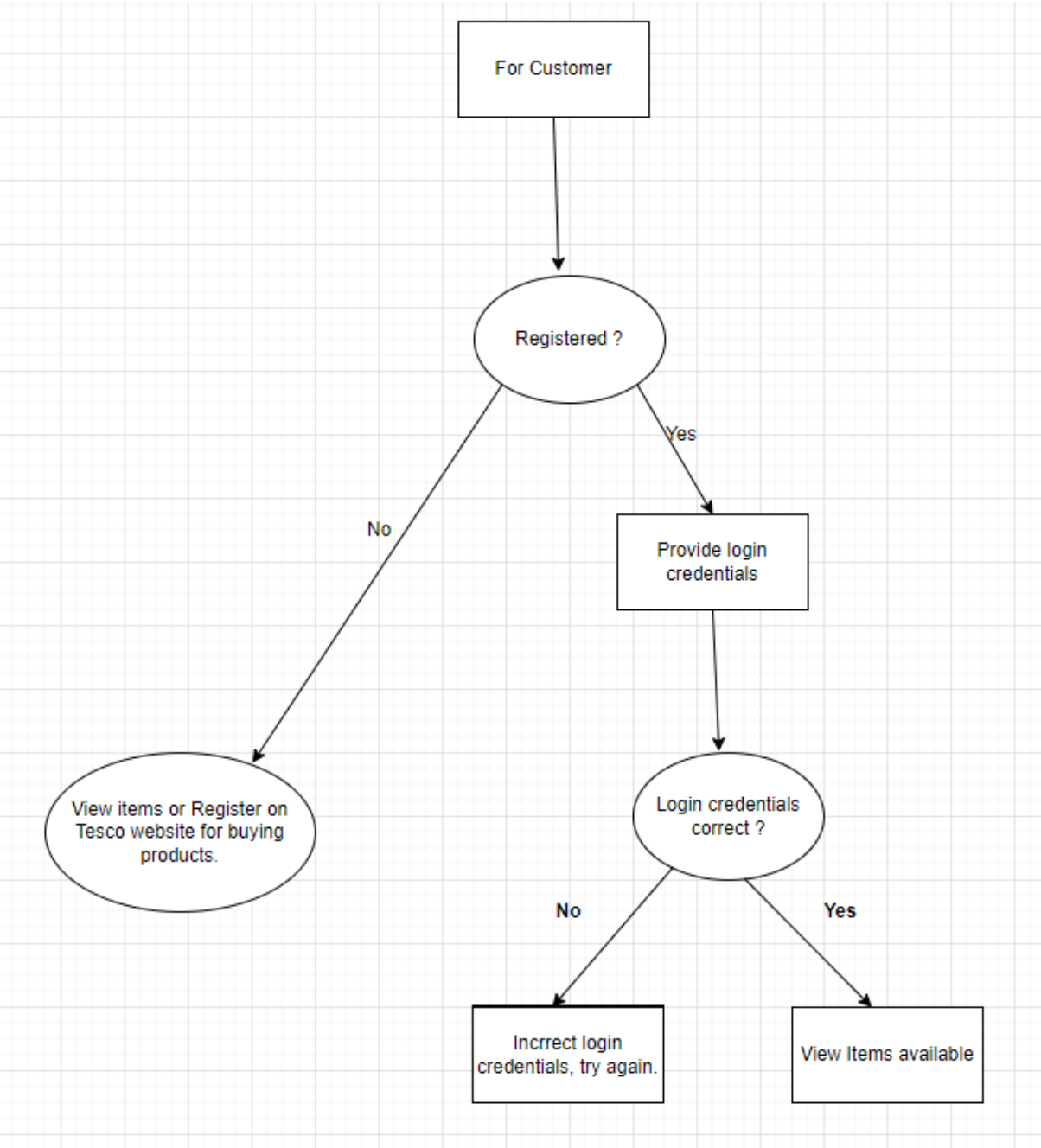


Figure 4: Decision Tree to check whether customer is registered or not?

The decision tree given above is for customers' login for Tesco Online Shopping. It provides how to navigate if the customer is registered with Tesco or not.

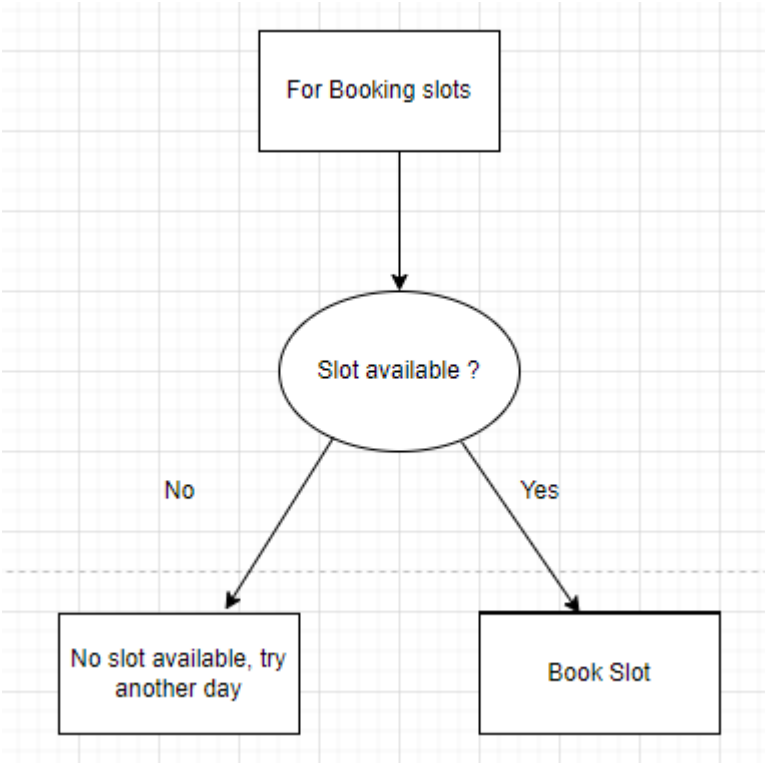


Figure 5: Decision Tree for Booking Slot

Here, the decision tree shows the slot booking procedure for the customer after the customer is logged in.

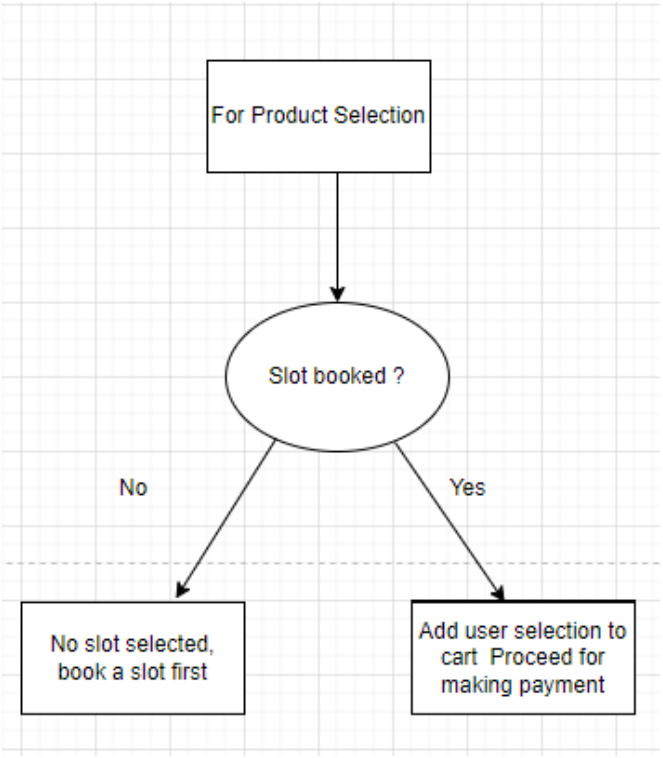


Figure 6: Decision Tree for product selection

After booking the slots only you can make the product selection. In the decision tree provided above, this procedure is derived.

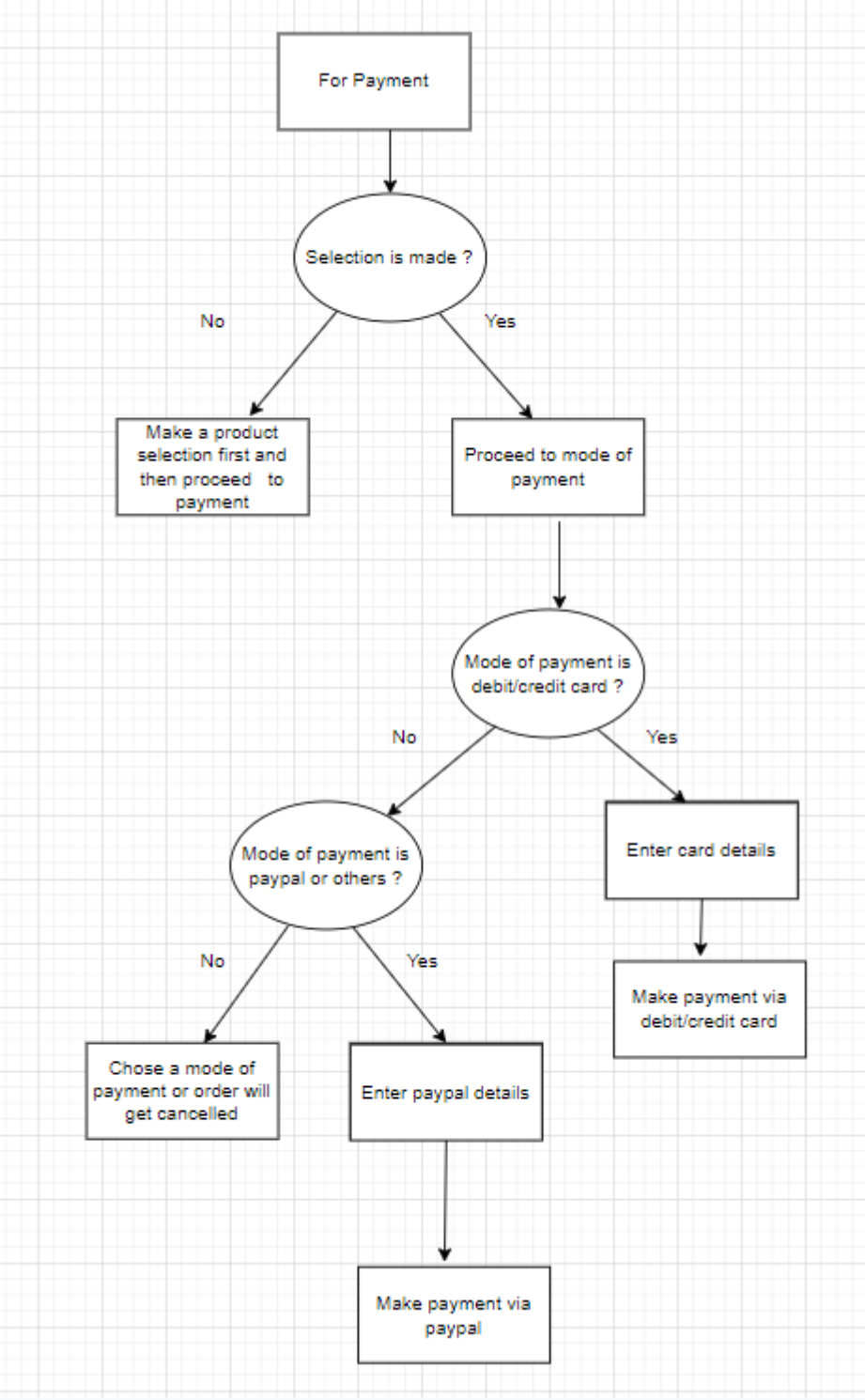


Figure 7: Decision Tree for Payment

Finally, after the selection of the products that have been made, the customer is then led towards the payment section and guided thoroughly through it.

3.4.2 UML Use Case Diagram:

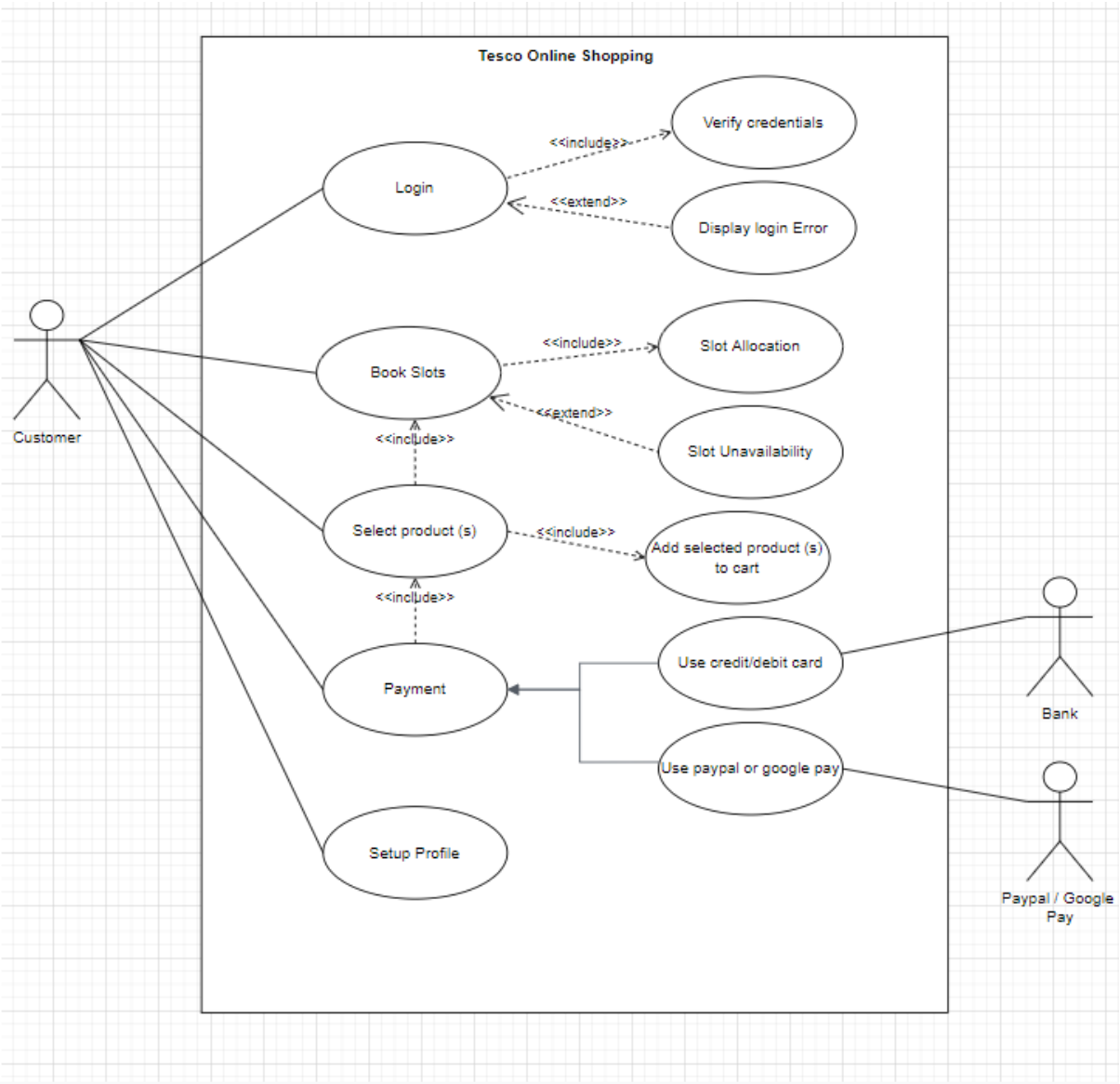


Figure 8: UML Use Case Diagram for Tesco

The purpose of a use case diagram in UML is to demonstrate the different ways that a user might interact with a system. Given use case diagram derives Tesco's Online shopping system. Due to Covid measures, still many of the customers are not willing to show up in the supermarket. Tesco is still fulfilling the demands of the customer and making them satisfied.

3.4.3 UML Use Case Description:

Use Case Name	Tesco Online Shopping
Scenario	Customer shopping from Tesco's mobile app or website
Actors involved	Customer, Bank, Google pay / PayPal

Pre-conditions	Login details verified
Post-conditions	The ordered product(s) will arrive with the customer receipt of the product(s) purchased
Standard Scenario	1. Login Successfully 2. Slots booked and products selected 3. Payment made successfully
Alternate Scenario	1. Not able to login due to network issue. 2. Not able to log in due to Tesco's server issue 3. Failed to book slot due to heavy internet traffic 4. Missed the product(s) due to slots unavailability 5. Payment issue due to a network error or insufficient balance

Table 3: UML Use Case Description for Tesco Online Shopping

3.5 Define Requirements:

In this section, we will be using Level 0 and Level 1 DFD diagrams and descriptions with UML class diagrams and UML sequence diagrams for Tesco.

3.5.1 Level 0 and Level 1 DFD Diagram and Description:

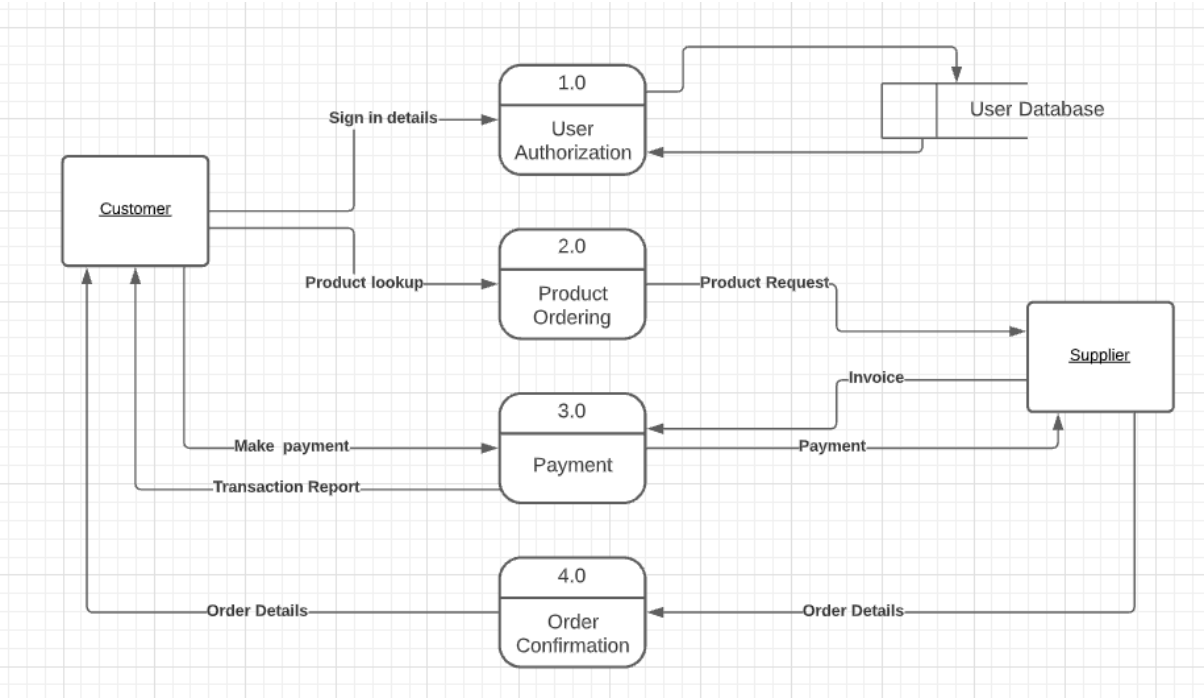


Figure 9: Level 0 DFD Diagram

Process ID	1.0
Process Name	User Authentication
Working	• Verify user credentials • Give success message if credentials are correct • Give error message if credentials are incorrect

Table 4: User Authentication Process Description

Process ID	2.0
Process Name	Product Ordering

Working	1. Customer
	    1. View the product list
	    2. Add the selected product in the user's cart
	    3. Guide the user to the payment section
	2. Supplier
	    1. Make the product request

Table 5: Product Ordering Process Description

Process ID	3.0
Process Name	Payment

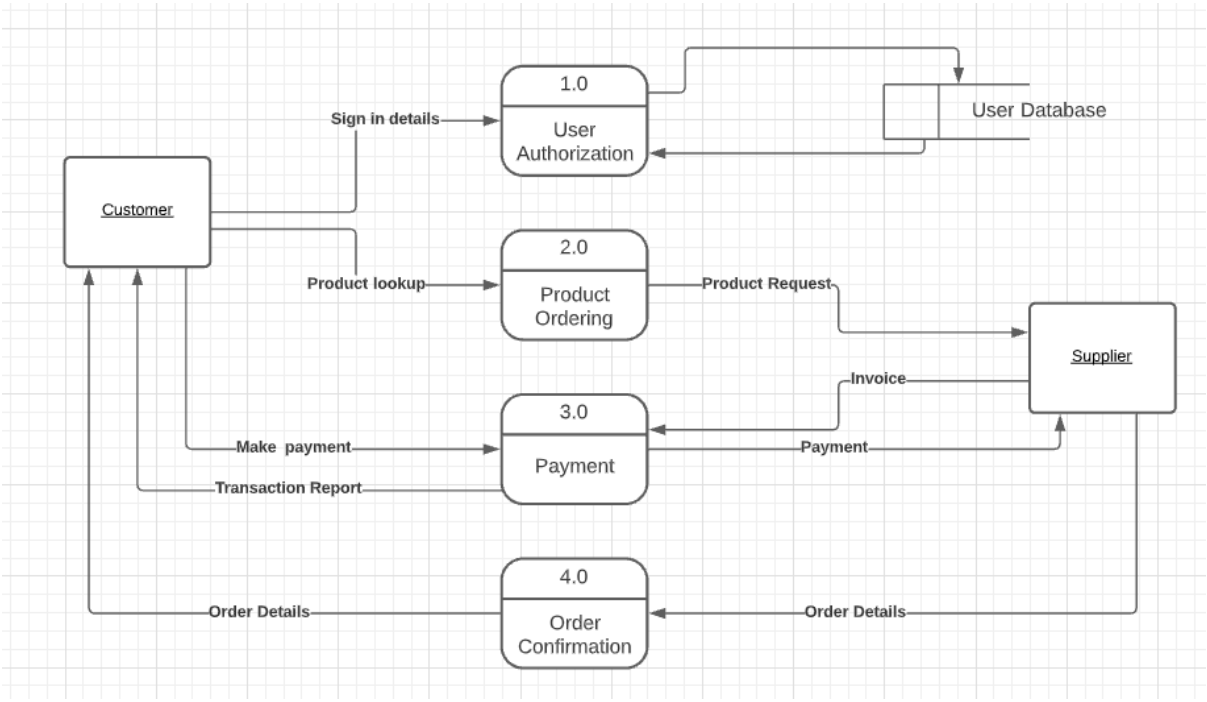
Working	1. Customer
	    1. Charge the customer for its product selection
	    2. Provide the transaction details after successful payment
	    3. Assure the customer for successful delivery
	2. Supplier
	    1. Receive the invoice for the product request
	    2. Complete the payment to the supplier

Table 6: Payment Process Description

Process ID	4.0
Process Name	Order Confirmation

Working	1. Customer 1. Provide the customer with proper details of the confirmed order 2. Supplier 1. Receive the details of the product request of a successful delivery of goods

Table 7: Order Confirmation Process Description



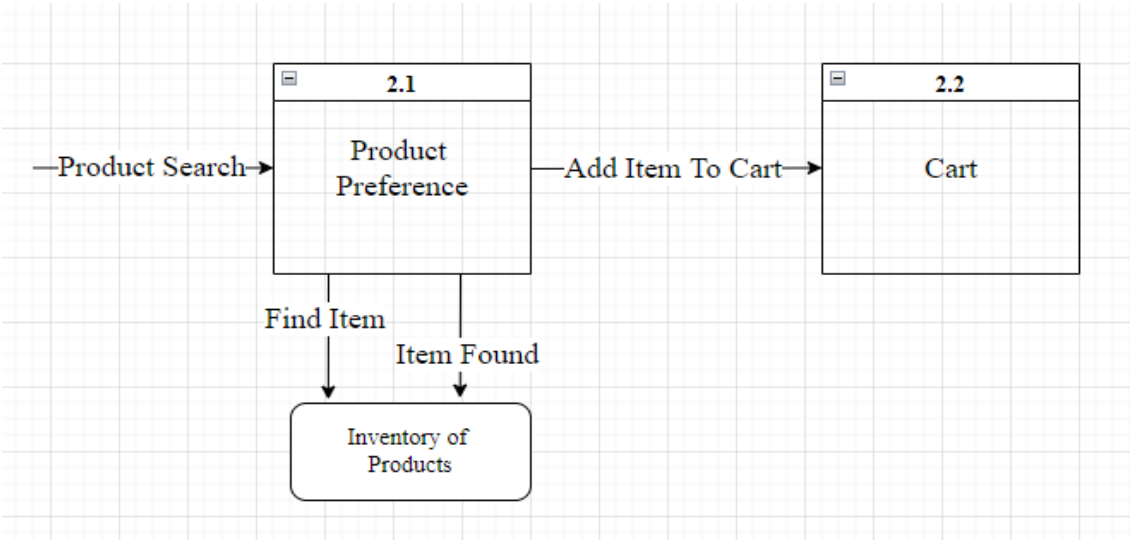


Figure 10: Level 1 DFD Diagram

Process ID	2.1
Process Name	Product Preference
Working	1. Searching the product 2. Product availability 3. Alternative product selection if the selected product is unavailable

Table 8: Product Preference Process Description

Process ID	2.2
Process Name	Cart
Working	1. Saving the product 2. Proceeding towards checkout, for making payment of the purchase.

Table 9: Cart Process Description

3.5.2 UML Class Diagram

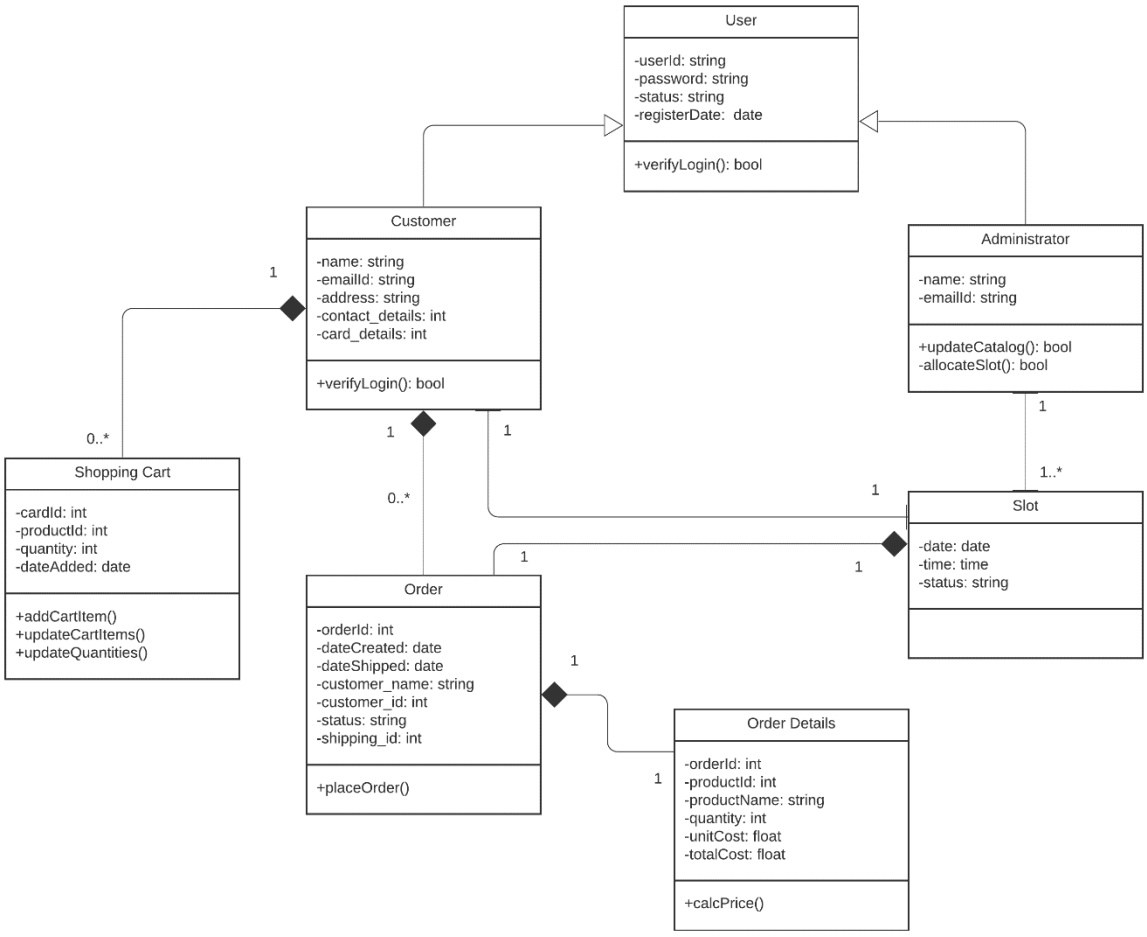


Figure 11: UML Class Diagram for Tesco

UML class diagram for Tesco online shopping system is created based on different relations mentioned in UML class diagram. Different classes involved here are User, Customer, Administrator, Shopping Cart, Order, Order Details, Slot. This class diagram shows the relation between these classes and how they interact with each other in real world.

3.5.3 UML Sequence Diagram

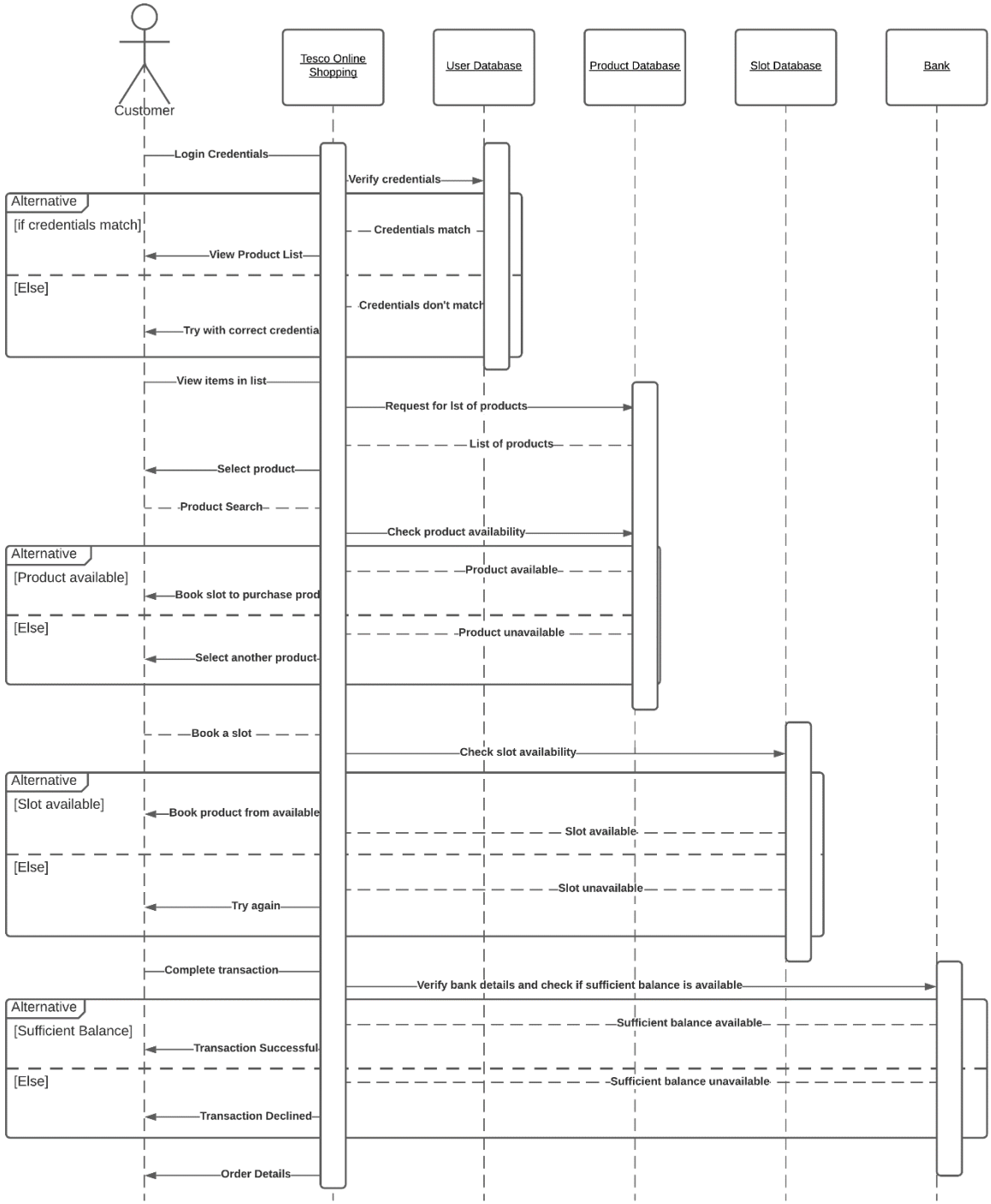


Figure 12: UML Sequence Diagram for Tesco

UML sequence diagram presented here is depicted for Tesco shopping procedure. Customer is shopping through website or mobile application. It has simple procedures starting with valid

credentials, following with scrolling the product list and booking slot for purchasing the product and payment transaction.

Task 4: Comments, Observation and Recommendation

On the basis of what we have observed so far, Tesco has gone through a hard time in the past few years. The number of stores all over the world has been decreased by 3000 in the past 4-5 years. According to the strategy analysis done using Michael Porter's Five Forces Model and Resource Audit, Tesco is a fast-growing company and still can expand a lot in the UK and ROI (Regions Of Ireland) itself. Although Tesco has exited many countries, the annual revenue, and the quality of services has not decreased. The chance of losing from the competition from the following major retailers in the market will still be there even though Tesco is far ahead as mentioned in section 3.1.1.1. Still, the majority of the products from Tesco with its own brand name are unbeatable. Tesco worked really hard to complete the needs of its customers even in the times of Covid and managed to maintain its annual revenue in the same year.

According to CATWOE analysis, we realized the important perspectives of some of the crucial stakeholders and prioritized them with the help of the power/interest grid in section 3.3.2. We came to know that in Covid times, even with the Government policies and regulations, Tesco managed to deliver the products at an efficient cost regardless of the lack of suppliers. It is important that Tesco develop a model in such a way that it is able to earn profits as well as not compromise customer needs. From all this, we can easily say that Tesco really cares about its customers and always tries to give the best service possible.

UML use case diagrams showcase how Tesco has worked in order to maintain its clientele without complicating the purchasing procedure. Even a new customer can buy products easily with the help of self-guided systems. Further detailed representation is given in the UML class diagram and UML sequence diagrams.

Overall, Tesco is a reliable industry in which a customer can put his trust. Tesco has its products in almost every industry nowadays some of which include Tesco banks, Tesco sim cards, Tesco mobile phones, etc

Task 5: Evaluation

For the creation of most of the diagrams like DFD context diagrams, UML diagrams, and decision trees, the free-to-use draw.io has been used. It provided all the necessary tools and symbols required to complete the diagrams. Being free of cost to use, draw.io does not feel inferior to any of its competitors like lucidchart. In fact, it is used in companies for making presentation purposes as well. Draw.io gives tons of possibilities and neatness with simplicity to draw unlimited designs and diagrams without logging in or signing in.

Porter's Five Force model allowed us to check the internal and in-depth knowledge about Tesco's competition, current market status, its current product positions, and various other factors. It helped us to understand and deduce the future actions of Tesco and how to tackle the complicated situations.

Based on the rich picture and DFD context diagram, the overall working of Tesco in the times of Covid and pandemic is shown. The rich picture helped us to visualize the problems and situations faced by Tesco while delivering the products to its customers.

CATWOE and Power/interest grid helped us in the understanding of the different perspectives on the major stakeholders and whom to prioritize the most. Similarly, the easy-to-read decision tree and UML diagrams gave us a great view of how perfectly the system can work even without making physical contact with each other.

Part 2: Business Data Analysis

Task 1: Introduction

Market basket analysis is a data mining technique used by retailers to increase sales by better understanding customer purchasing patterns (Tech Target Contributor, 2019). It involves analysing large data sets, such as purchase history, to reveal product groupings, as well as products that are likely to be purchased together (Tech Target Contributor, 2019). It basically analyses the customer's buying pattern and predicts and adjusts the future buying options for them which will help the business to grow. In market basket analysis, association rules are used to predict the likelihood of products being purchased together. Association rules count the frequency of items that occur together, seeking to find associations that occur far more often than expected.

The apriori algorithm is commonly used for the analysis of the articles related to the market basket analysis and to find the relation between frequently bought items from a larger data set and find a better suggestion (Tech Target Contributor, 2019). In this section, we are going to carry out Market Basket Analysis on a grocery dataset. The apriori algorithm will be used to find the relation between the products which are frequently bought together. Further analysing those results, a promotion will be created in order for more sale.

Various metrics are in place to help us understand the strength of association between two products. Few of those metrics are (Garg, 2018):

1. Support: This measure gives an idea of how frequent an itemset is in all the transactions. If item1 is {pizza} and item2 is {bread} and the pizza is bought more frequently, then the pizza has more support than bread (Garg, 2018).
2. Confidence: This measure defines the likeliness of occurrence of consequent on the cart given that the cart already has the antecedents. If a combination of bread and milk is there, they have high confidence but a combination of pizza and milk, the confidence will be low (Garg, 2018).
3. Lift: Let X and Y be two products. To rephrase, lift is the rise in probability of having {Y} on the cart with the knowledge of {X} being present (Garg, 2018)

.

Task 2: Analysis

For the analysis, we have the dataset of grocery store which consists of the group of items purchased together. We have total of 9835 records as shown below:

```
In [95]: dataset = pd.read_csv("groceries.csv", header=None)
         dataset.shape

Out[95]: (9835, 32)
```

Figure 13: Number of records in dataset

Here, we are going to check the number of records which has support of at least 5%.

```
In [107]: frequent_itemsets = apriori(format_data, min_support=0.05, use_colnames=True)
          frequent_itemsets
```

Out[107]:

	support	itemsets
0	0.052466	(beef)
1	0.080529	(bottled beer)
2	0.110524	(bottled water)
3	0.064870	(brown bread)
4	0.055414	(butter)
5	0.077682	(canned beer)
6	0.082766	(citrus fruit)
7	0.058058	(coffee)
8	0.053279	(curd)
9	0.063447	(domestic eggs)
10	0.058973	(frankfurter)
11	0.072293	(fruit/vegetable juice)
12	0.058566	(margarine)
13	0.052364	(napkins)
14	0.079817	(newspapers)
15	0.193493	(other vegetables)
16	0.088968	(pastry)
17	0.075648	(pip fruit)
18	0.057651	(pork)
19	0.183935	(rolls/buns)
20	0.108998	(root vegetables)
21	0.093950	(sausage)
22	0.098526	(shopping bags)
23	0.174377	(soda)
24	0.104931	(tropical fruit)
25	0.071683	(whipped/sour cream)
26	0.255516	(whole milk)
27	0.139502	(yogurt)
28	0.074835	(whole milk, other vegetables)
29	0.056634	(whole milk, rolls/buns)
30	0.056024	(whole milk, yogurt)

Figure 14: Results of filtering products having greater than 5% of support value

In the results above, we can see that there are total of 30 products or combination of products which has support value of more than 5%. In our dataset, the highest purchased product is milk with support value of 0.255516 followed by other vegetables with support value 0.193493 and rolls/buns with support value 0.183935.

Now we are going to calculate the confidence and lift of the result of 20 records using the “association_rules” method.

```
In [109]: result = association_rules(frequent_itemsets, metric = "lift", min_threshold=0.01)
          result.sort_values('lift',ascending=True)
          result
```

Out[109]:

	antecedents	consequents	antecedent support	consequent support	support	confidence	lift	leverage	conviction
0	(whole milk)	(other vegetables)	0.255516	0.193493	0.074835	0.292877	1.513634	0.025394	1.140548
1	(other vegetables)	(whole milk)	0.193493	0.255516	0.074835	0.386758	1.513634	0.025394	1.214013
2	(whole milk)	(rolls/buns)	0.255516	0.183935	0.056634	0.221647	1.205032	0.009636	1.048452
3	(rolls/buns)	(whole milk)	0.183935	0.255516	0.056634	0.307905	1.205032	0.009636	1.075696
4	(whole milk)	(yogurt)	0.255516	0.139502	0.056024	0.219260	1.571735	0.020379	1.102157
5	(yogurt)	(whole milk)	0.139502	0.255516	0.056024	0.401603	1.571735	0.020379	1.244132

Figure 15: Output values for lift and confidence for various products

In the results above, there are total 9 columns and every column gives us the an important value. Antecedents are the items that the customer has already bought. Consequents are the items that the customer is most likely to buy. Antecedent_support and consequent_support are the support values for antecedents and consequents respectively. Support column gives us the support value of combine whole milk and other vegetables.

According to the results we received, there is a 40.16% confidence value that if a customer has purchased “yogurt” then that customer will buy "whole milk” as well. And the relation between “whole milk” and “yogurt” is very strong. If the lift value is greater than 1, that means the customer is most likely to buy the consequents. Here the highest lift value is between whole milk and yogurt which is 1.571735. In this way we can create a recommendation system, which will be greatly helpful for the grocery business and will ease the product search for the customers as well.

Task 3: Conclusion and Recommendation

With the results and analysis on the dataset, it is clear that the “whole milk” is the most selling product of the store. It is present with almost every combination of products and very high in demand as well. Combination of “whole milk” and “yogurt” is very popular. Other high selling combinations including “whole milk” are “whole milk” and “other vegetable”, “whole milk” and “rolls/buns”.

There has to be a point noted that out of hundreds of products or combination of products purchased, only 30 of them came up as results for the support value greater than 5%. Here, multiple factors can affect the purchase like the vicinity, the time of purchase, the accessibility of the location where the store is situated.

With this analysis, the “whole milk” should be kept at the most easily accessible place where every customer can find it. “Yogurt” and “other vegetables” should be kept near to the milk followed by “rolls/buns”. Sections in a store can be organized by using the results which can help in boosting the store profit in return. In this way, the association rules can be helpful in a business not by just telling us which product has the highest chance of being purchased or has been purchased mostly, but can also be used to arrange the store in an easy manner.

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