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Module Leader: Priyatharshini Rajaram

**Title: Analyzing CRM, Sales and Shipment issue
for Nykaa**

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Introduction

NYKAA is the most popular online retail company for beauty products in India. This is one of the E-Commerce companies in India which is headquartered in Mumbai, Maharashtra. In the year 2012, Falguni Nayar, a former managing director of KOTAK Mahindra Capital Company, formed it. It is an online store that allows customers to buy brand items for skincare, cosmetics, luxury goods, fragrances, and hair, body, and shower products for both men and women. Falguni Nayar, who has always wanted to establish her own business, decided to create a platform just for selling cosmetics because, despite the existence of numerous e-commerce websites, none of them are meeting consumer expectations (Vyas, Mathur and Shukla, 2018).

Nykaa ranked top 3 online stores in India and it offers more than 2,000 brands and 200,000 products. Earlier in 2019, it sells only for Nepal but in January 2020 Nykaa decided to start ships to 13 international countries this news was announced in Facebook. Presently, worldwide shoppers can purchase later Indian fashion brands and their own custom labels. The name Nykaa has special meaning which is a translation of the Sanskrit word "Nayaka," which means "actress" or "one in the spotlight" (Karan, 2016). Nykaa is dedicated to seeing the star in every woman, and being her confidante and ally as she sets out on her own path to find her individual personality and sense of style. Nykaa has total 1000+ brands over 96 physical stores in 45 cities. This company buys the products from different brands and sells to several offline or online platforms (FinShiksha, 2022).

Over the past four years, India's E-commerce markets for personal care and beauty products have grown at a CAGR of 60%, and they will account for about 8% of the market in 2020 (FinShiksha, 2022). There are 33 physical stores/outlets operated by Nykaa, which are divided into two formats: Nykaa on Trend and Nykaa Luxe (Kaushik, n.d.).

The graph below illustrates Nykaa's market expansion in previous years.

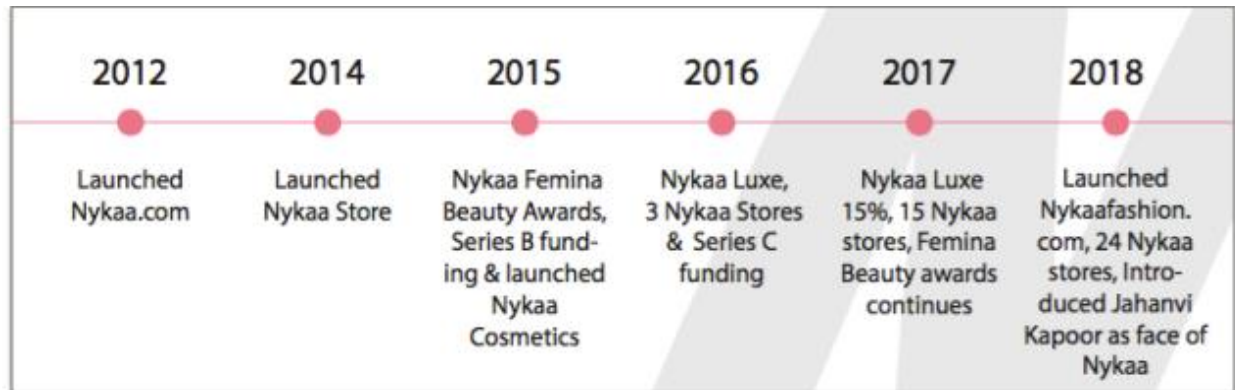


Fig 1: Nykaa market approach

The quote of Nykaa is *your beauty, our passion*. Nykaa has a team of experts in the field of beauty and health that guide and assist clients from all around the world in the relevant area (Vyas, Mathur and Shukla, 2018).

Mission, Vision, and Values

The goal of Nykaa is "creating a world where our customers have access to a beautifully curate, authentic range of items and services that excite and elevate the human spirit" (www.nykaa.com, n.d.).

The vision is to "Bring inspiration and excitement to everyone, everywhere, every day."

The below picture illustrates the values of Nykaa (www.nykaa.com, n.d.).



Fig 2: Values of Nykaa (www.nykaa.com, n.d.)

Justification of Tools and Techniques

For this study the author has taken several techniques for analyzing business insights. For analyzing Nykaa business strategies the selected analysis are SWOT and Michael portal 5 force analysis. By using SWOT analysis, the Strengths, Weakness, Opportunities and Threats can be found. The purpose of choosing Portal 5 force analysis is for finding threats from new entrants, suppliers and finding rivalry among the competitors. To draw the pictures author used draw.io for better view.

The author used Rich Picture and Data Flow Diagrams to analyze the current scenario. The Rich picture is one of the tools used to illustrate the business insights easily through graphically (Monk and Howard, 1998). Data flow diagrams are used to explain Nykaa online shopping system. This tool is used to draw the visualizations over data movement (Li and Chen, 2009).

CATWOE and Power/Interest Grid have been selected as the methodologies for analyzing stakeholders. CATWOE analysis results the perspectives of the stakeholder which will help to solve the conflicts. The Power Interest grid shows which stakeholders have more power and aids in understanding their interests in a way that will support the development of the company.

Using DFD's and Unified Modeling Language (UML) use case diagrams for analyzing the purpose of the situation is given better view because DFD takes the inputs and gives the data movements in the way where non-professionals can understand the process (Structured English also played good role in explaining business process).

For defining requirements UML Entity relation and Activity diagrams are used which will give more insights for finding CRM issues and shipping problems.

Different types of Analysis

Strategy analysis

An organization's strategies and scope must be in line with stakeholder expectations in order to compete in the new market. Configuring resources and competences helps to achieve this. With the aid of Nykaa's SWOT analysis, we can better understand businesses and assist them in achieving their objectives by looking at both internal and external factors (Shastri, n.d.).

SWOT analysis

Strengths of Nykaa

In SWOT analysis strength is one of the essential components. The company Nykaa is the biggest E-Commerce provider of beauty and wellness items in India due to numerous of its advantages (Shastri, n.d.).

- **Innovation:** To attract clients' attention and keep up with the fast-paced business environment, Nykaa has switched from a digital to an Omni-channel company model.
- **Active Engagement in Social Media:** With frequent online advertising about company, product, and endorsement, we series and publications, Nykaa successfully able to get the customers attraction.
- **Numerous Products:** To keep clients from switching to competing brands, Nykaa offers a wide range of items that are current with market demands.
- **Affordability:** Some people are unwilling to purchase due to price, while others are. Nykaa is aware of this and provides items at a variety of price points that are accessible to everyone.
- **Cheap price Suppliers:** Nykaa has suppliers who provide good products with lower cost which increase company sales.
- **Legal Rights:** Nykaa has intellectual rights which results of producing products on its own and less competition with rivals.

Weaknesses of Nykaa

Every industry has weakness, Nykaa also some weakness. Some of them are listed below (Shastri, n.d.).

- **Poor Waste Management:** Nykaa received several complaints about packing and type of materials used for products.
- **Research & Development:** As per the analysis Nykaa is not spending much time on research and developing new things, because of this company unable to find other competitors moves.
- **Customer service:** Nykaa is taking customer complaints seriously and slow delivery.
- **Slow decision-making:** As Nykaa is small group, directors' decision-making process is slow while bringing new products or processes.
- **Inability to provide high discounts in a price sensitive market.**

Opportunities for Nykaa

Every organization should look for opportunities for the future growth. Below are some other options for Nykaa (Shastri, n.d.).

- **Creating awareness for customer:** Nykaa has some loyal and potential customers and using these people Nykaa can utilize for reputation.
- **E-commerce & Networking:** These are top techniques for any organization growth. Social media as a platform Nykaa can take the opportunity.
- **Company structure:** Nykaa's marketing strategy involves scaling a new level to expand its global penetration and gain benefit.
- **Modern Technology:** It is possible to implement advancement into core business by developing new technology to assist in the development and shipment of goods. With the help of advanced technology company can increase the production, maintain profits and quick process.
- **Trendspotting:** Organizations should adopt emerging trends to make it simple to attract clients.

Threats to Nykaa

The risks that Nykaa faces are outlined below (Shastri, n.d.).

- **E-commerce Rules:** Government includes some regulations for every industry for better future and environmentally safe. For inventing new products into the industry without proper testing is threat to Nykaa.
- **Competitor's risk:** Due to intense competition from firms like purple and smaller beauty companies, Nykaa's sales are declining.
- **Health Concern:** Since cosmetics are applied directly to the face, any mistakes could harm the body. This makes it difficult for Nykaa to retain its user-friendly and ecological products.
- **Economic Conditions:** The COVID pandemic hit Nykaa hard economically. Nykaa is attempting to contact their customers again following the outbreak.

Michael Porter 5 force model for Nykaa

This model helps organizations to make better decisions for the growth. By using model organizations can find the strengths and competition among other organizations. Since the five

elements are interdependent, Nykaa may assess how well their products work to raise customer satisfaction and increase sales using these forces. Together with the PESTEL framework, Nykaa may also predict the future attractiveness.

The portal 5 forces are explained below

Threats of new entrants

Nykaa is a small firm where concentration of customer satisfaction is important towards products. Nykaa gathered very loyal clients but still because of new entrants' threat **will be high** as other companies like Reliance, Tata group are providing fast door deliveries and super-apps (Adarshhpandey, 2022).

Indirect competitors like local businesses providing organic and cruelty-free products, as well as an increasing number of direct competitors like Purple, are having an impact on the business's capacity to retain and expand its customer base (Case48, n.d.).

Threat of Substitute Products or services

The competitive rivalry is difficult for Nykaa passion for Beauty and other established competitors since substitute goods and services are readily available. The high threat of substitute products leads less customers because clients can choose other products where they can get cheap high quality products (Case48, n.d.). This **threat is medium** for Nykaa due to promotions which provided during festivals and year end. Sometimes Nykaa fashion offers special discounts for the customers who buy their products regularly. It values mainly on Customer loyalty than money which makes constant growth.

Rivalry among existing firms

The competition among the beauty companies for **Nykaa is low** because Nykaa is growing fast and it a clear market leader. The platform which provides only beauty products are less so Nykaa has a unique brand in the industry. The Nykaa fashion products are contains rare brand which makes consumer stick to the same fashion even when they have new firms (Case48, n.d.). The business must invest time in Research and Development to identify other industry strategies and customer needs.

Bargaining Power of Suppliers

Higher bargaining power of suppliers will leads low profits and less growth for the industry. Suppliers' leverage during negotiations allows them to use strategies including lowering product availability, lowering product quality, and raising prices. Nykaa always tries to buy high quality products so it combined with several suppliers which give brand products with low price (Case48, n.d.). As per the research the bargaining power of suppliers for Nykaa is medium. Nykaa has a clear idea how much to buy for the sale otherwise if they don't have clear idea then the bargaining power of suppliers will increase.

Bargaining Power of Buyers

Customers are the key to products sale and they always try to buy best quality products with low price. Clients always looking for discounts, offers and promotions. As an e-commerce company they should always keep an eye on clients' interests and Nykaa is top in that. Nykaa always tries to look into customers eyes and provides up-to-date mark products with customers' expectations (Case48, n.d.). So, this force is medium for Nykaa.

Investigate Situation

Rich Picture for Nykaa

According to studies, there are certain delivery concerns with Nykaa. Nykaa delivery partners are Aramex, Bluedart, Ecom Express and DTDC (www.nykaa.com, n.d.). These are best transportation providers all over india but due to COVID their services are reduced and they are unable to reach rural areas. Due to this Nykaa lost customers but loyal customers are stick to Nykaa and they understand the situation.

Rich picture for Nykaa shipment issue is shown below:

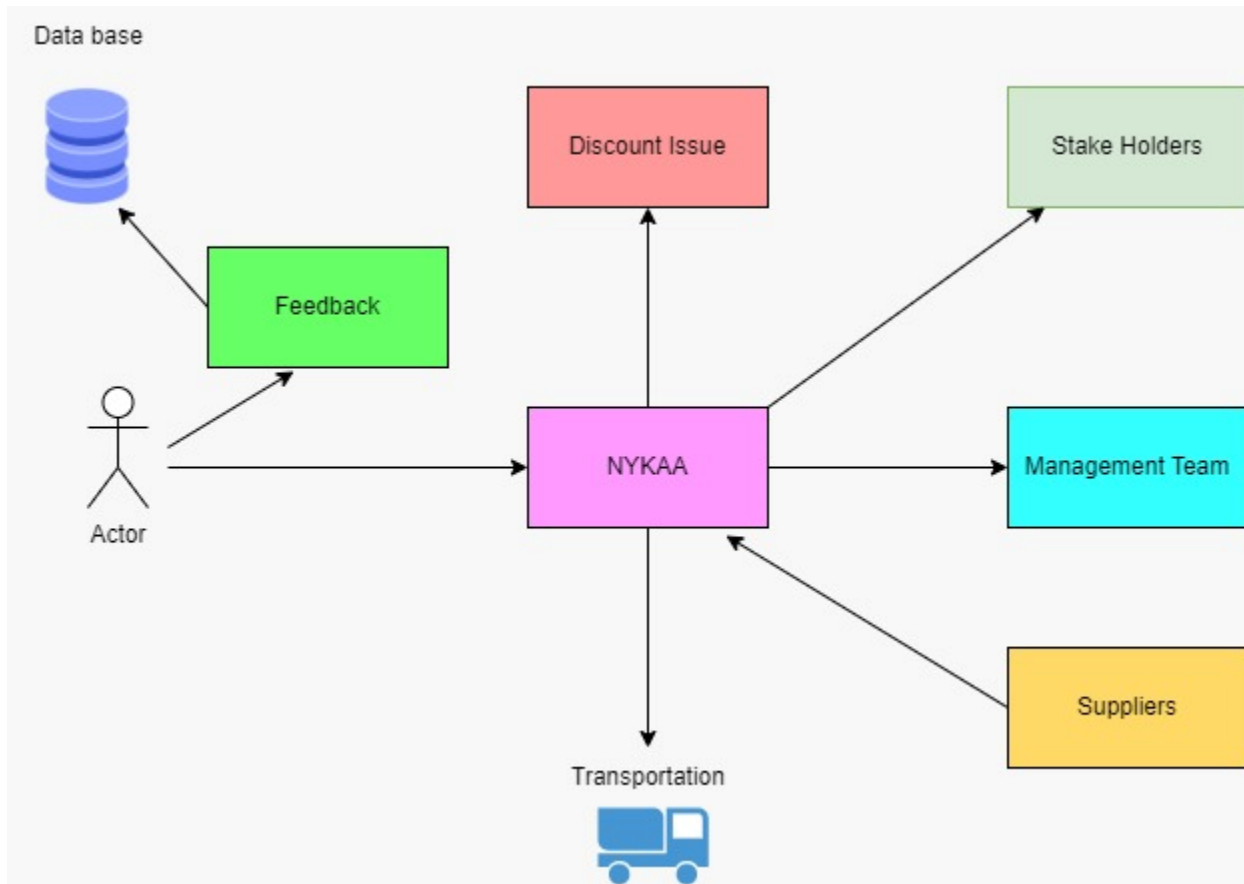


Fig 3: Rich picture

DFD for Nykaa online shopping system

Data flow diagram (DFD) is used to analysis the business process and through the visualizations the business insights can be represented. It is not a process because it just used to model the data flow transformation system (Li and Chen, 2009). Utilizing this DFD for Nykaa has the goal of better illustrating how the online system works.

Below is an illustration of the level 0 diagram, and the continuation for this is clearly explained in the define requirement section.

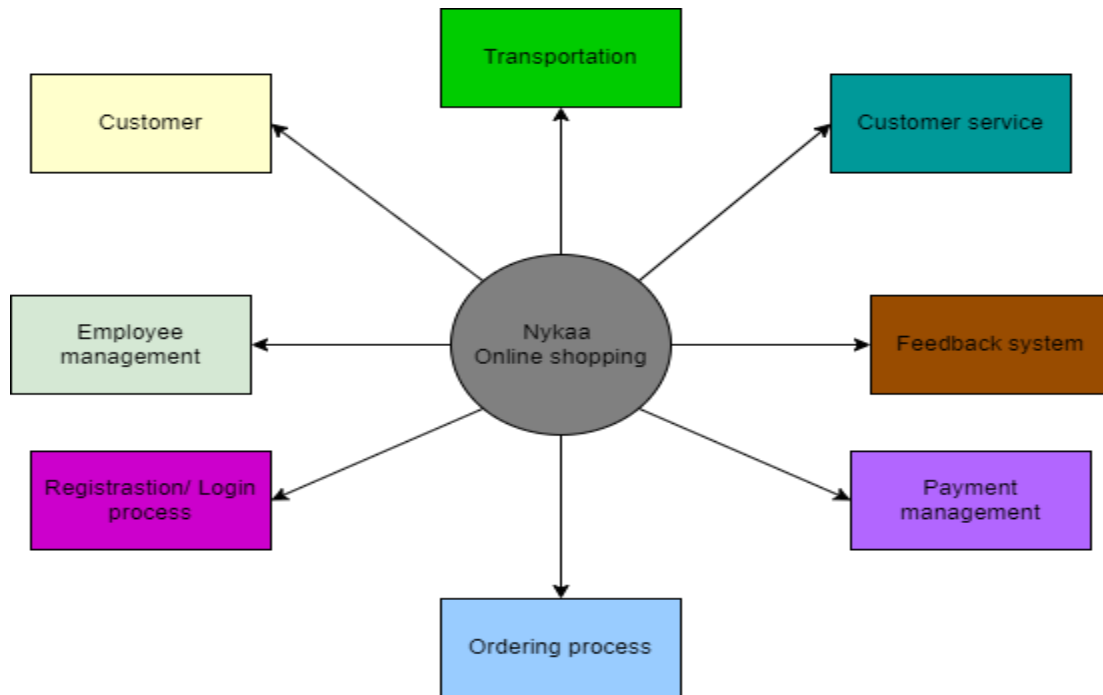


Fig 4: DFD for Nykaa online shopping



Fig 5: DFD for Nykaa shipping

Consider Perspective

Stakeholders are the people who are involved directly or indirectly in the organization for the growth of the industry. For an E-commerce site like Nykaa the stakeholders are founders, Employees, Investors, consumers, suppliers, creditors, management, society, and government.

There are many techniques to analysis or understand stakeholder's strategies and views. For this research author performed CATWOE analysis which is best suitable.

CATWOE Analysis

This analysis is one of the best power approaches for problem-solving strategic analysis. CATWOE analysis was invented by David Smyth in 1975 for his research methodology. This analysis helps organization to find the solutions for the critical issues and fill the gaps with new techniques and helps to find the organization goals and responsibilities of the people. The full form of CATWOE is Customer, Actor, Transformation, Worldwide, Owner and Environmental constraints and these 6 values will be identified to help organization for getting profits. Following is an explanation of the specific stakeholders views.

| | Board of Director's | Employees | Investors | Suppliers | Customer | Government |
|------------------------------------|---|---|---|--|---|--|
| Consumer | Shareholders of Nykaa | Consumer and environment | Consumers, Employees | Consumers and Employees | Consumers and environment | Local area people |
| Actor | Employees, Finance, and marketing team | Employees, support team, finance team, customers, and other staff workers | Customers, directors, employees, and investors | Customers, directors, employees, and investors | Employees and other competitors | Employees, customer, support team, finance team, and other staff workers |
| Transformation | Releasing product to market for profits | Releasing product to market for profits | Investing money on Nykaa products for profits and reputation | The people who give products to Nykaa | Provides best quality products and environment safe goods | Maintaining safeguards for environment |
| Weltanschauung Or Worldview | Earning money and grabbing attention from investors | As a result, people can find work. | Nykaa shares will increase, and consumers can find good beauty store. | Nykaa will gather the products from suppliers | Nykaa always comes up with good brand products | Preserving environmental safety measures |
| Owner | Investors who spend money for Nykaa products | Directors and Chief executing officers | Investors of Nykaa | Suppliers of Nykaa | Directors of Nykaa | Government team |
| Environmental Constraints | Policies, social distancing rules by government | Business regulations | Government policies and financial limitations | Ethics, consumer act and need to provide pollution free products | Consumer act | Legal constraints |

Fig 6: CATWOE analysis

Power/Interest Grid

The results of CATWOE analysis is used to find the stakeholders and their role in the business. For the better understanding of stakeholder's author performed Power/Interest Grid to get in depth details of stakeholders. Nykaa can identify whose job is more and less vital by applying this approach. As per the CATWOE analysis the identified stakeholders are Board of directors, Employees, Customers, Government, and shareholders. After finding stakeholders the author has to arrange them in a manner of power versus interest with respect to organization.

High Power / High Interest: This grid represents high power and high interest in the organization. These stakeholders have high influence in the industry and they can change or edit in the business. In this study of Nykaa Board of directors and investors are under this category. Falguni Nayar, Anchit Nayar, Alpana Parida, Sanjay Nayar and Milan Khakhar are the main board of directors who can make the decisions in the industry (www.nykaa.com, n.d.).

The investors of Nykaa are Morgan Stanley Asia, Aditya Birla Sunlife Mutual Fund and Regal funds management ate main (Crunchbase, n.d.).

High Power / Low Interest: In this section stakeholders and government are with high power and low interest. There are some stakeholders who have power but contain very low interest. Government has high power to take over Nykaa Business activities but it don't have any interest in that action until Nykaa ovulates the legal and environmental regulations,

Low Power / High Interest: Customers and Employees are under this category. They have interest but no power to change anything.

Low Power / Low Interest: The stakeholders who lack interest and power are covered by the grid. Basically suppliers can consider in this category because their duty is just to supply the products.

The power grid diagram shown below

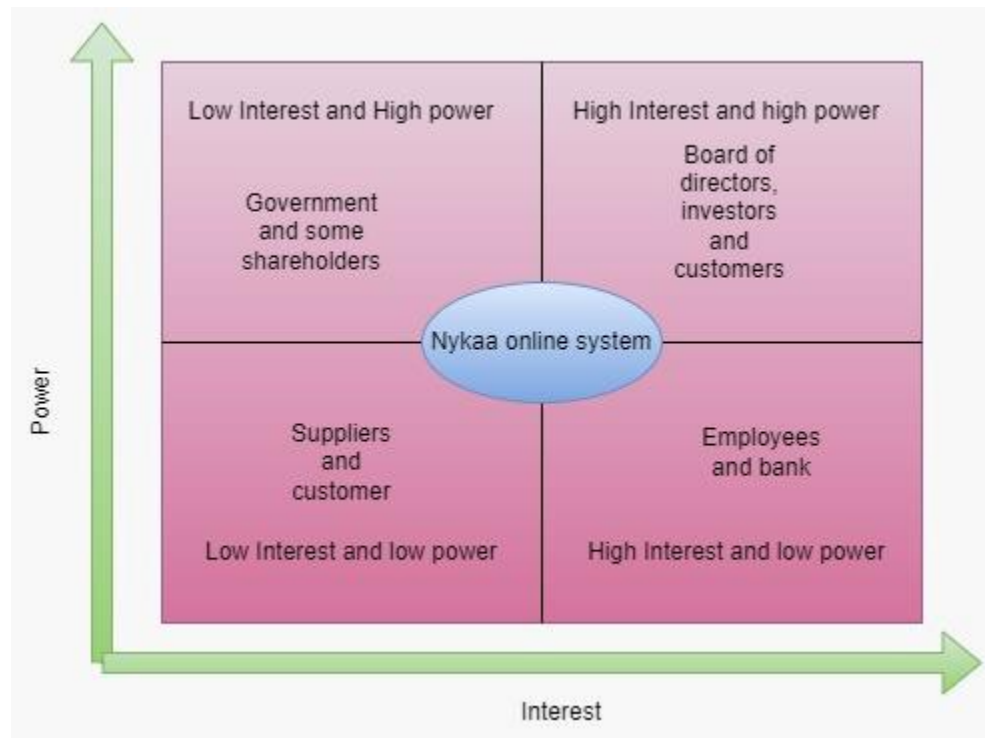


Fig 7: Power/Interest Grid

Analyse Needs

Structured English

Structured English is a representation of business steps in normal English which will be understandable to everyone. The purpose of ringing this concept is to give importance to non-programmers and cost effective with well formatted structure (Chamberlin and Boyce, 1976). The goal of designing structured English is to give knowledge or take other non-professional ideas into the project though the simple steps which need to be done in the project. To write this there is no need to learn anything just they should the process (Astrahan and Chamberlin, 1975). The main purpose for writing structured English for this research of Nykaa is based on the Use case diagram which represented below. The CRM issue is explained through this model below.

FOR Customer

IF Customer is Registered:

Enter login credentials

IF login credentials are correct:

Enter home page and view items

FOR selecting the product:

View and add to cart

Edit or delete cart items

END FOR

FOR making payment:

IF item is added to cart:

Proceed to Buy

Enter address details

IF discount apply:

apply coupon

select payment mode

IF payment mode is UPI:

Enter UPI address AND pin

Make a payment

ELSE IF payment mode is debit / credit card:

Enter card details AND pin

Make a payment

ELSE:

payment mode is cash on delivery

Pay at delivery person

ELSE:

select payment mode

IF payment mode is UPI:

Enter UPI address AND pin

Make a payment

ELSE IF payment mode is debit /credit card:

Enter card details AND pin

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Make a payment

ELSE:

payment mode is cash on delivery

Pay at delivery person

FOR tracking the product:

Check the status of the order

FOR successful delivery of product:

Add feedback from customer

store the feedback in Customer data base

Analyze it

END FOR

FOR EACH Customer in Customer database

Retrieve the Customer feedback from Customer

-database

Read and add requirements based on the feedback

END FOR

ELSE:

view items and add to cart

END FOR

ELSE:

Please enter correct login credentials

ELSE:

Register via gmail or facebook for purchasing products

END FOR

UML Use case diagram for Nykaa

The purpose of this diagram for Nykaa is for better understanding the cases of the project and which can be represented through simple English text non-executable format. The cases for this study are registration, login, browsing, add to cart, make a payment, feedback consideration and shipping.

Use case diagram shown below:

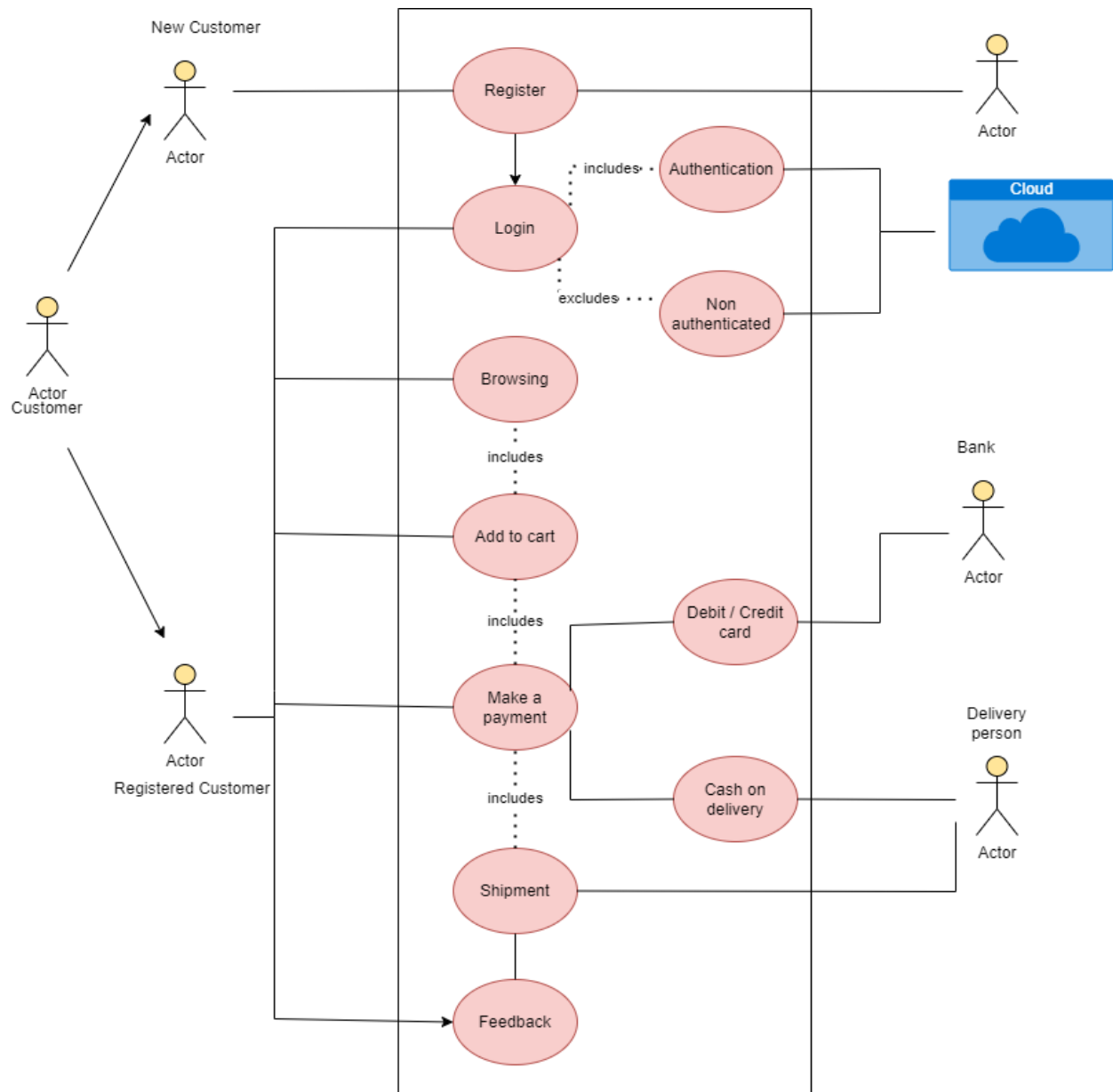


Fig 7: Use case diagram for Nykaa

The use case description for process is represented below:

| | |
|----------------------|--|
| Use case name | Nykaa online shopping. |
| Scenario description | Buying beauty products over Nykaa application. |
| Actors involved | Directors, Employee, Bank and Customers. |
| Pre-conditions | Authentication of login details for buying product through Nykaa. |
| Post-conditions | Provide transaction receipt and order summary. |
| Success case | <p>Success case would include following steps:</p> <ol style="list-style-type: none"> 1. Successful registration without issues. 2. No problems while doing login and viewing the products. 3. Be able to add the items to the cart without difficulties. 4. No difficulties while doing payment. 5. Good packing without any waste plastic materials and fast delivery. 6. Asking for Feedback for knowing the customer satisfaction and need to be analyzed properly through the team. |
| Failure case | <p>Failure case:</p> <ol style="list-style-type: none"> 1. Unable to register (server or network issue). 2. Unable to login because of improper authentication. 3. Unavailability of products for sale. 4. Not able to do payment because bank server issue or insufficient balance in the customer account. |

Fig 8: Use case description

Define Requirements

In this section the author is trying to explain the modeling process of the online system. The CRM and transportation issues are explained clearly in this section.

Level 0 and Level 1 DFD diagrams

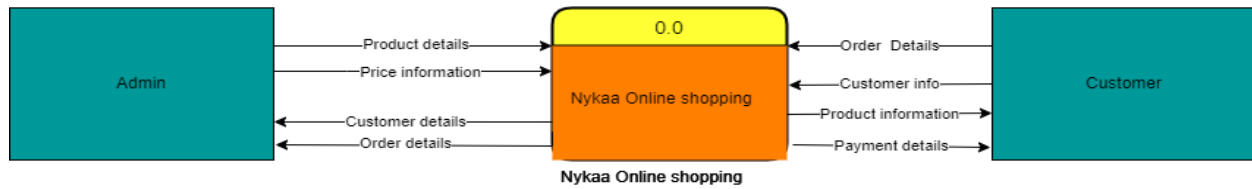


Fig 9: Level 0 diagram for Nykaa

Level 1 diagram

The DFD level 1 diagram for Nykaa CRM and shipping issue is shown below

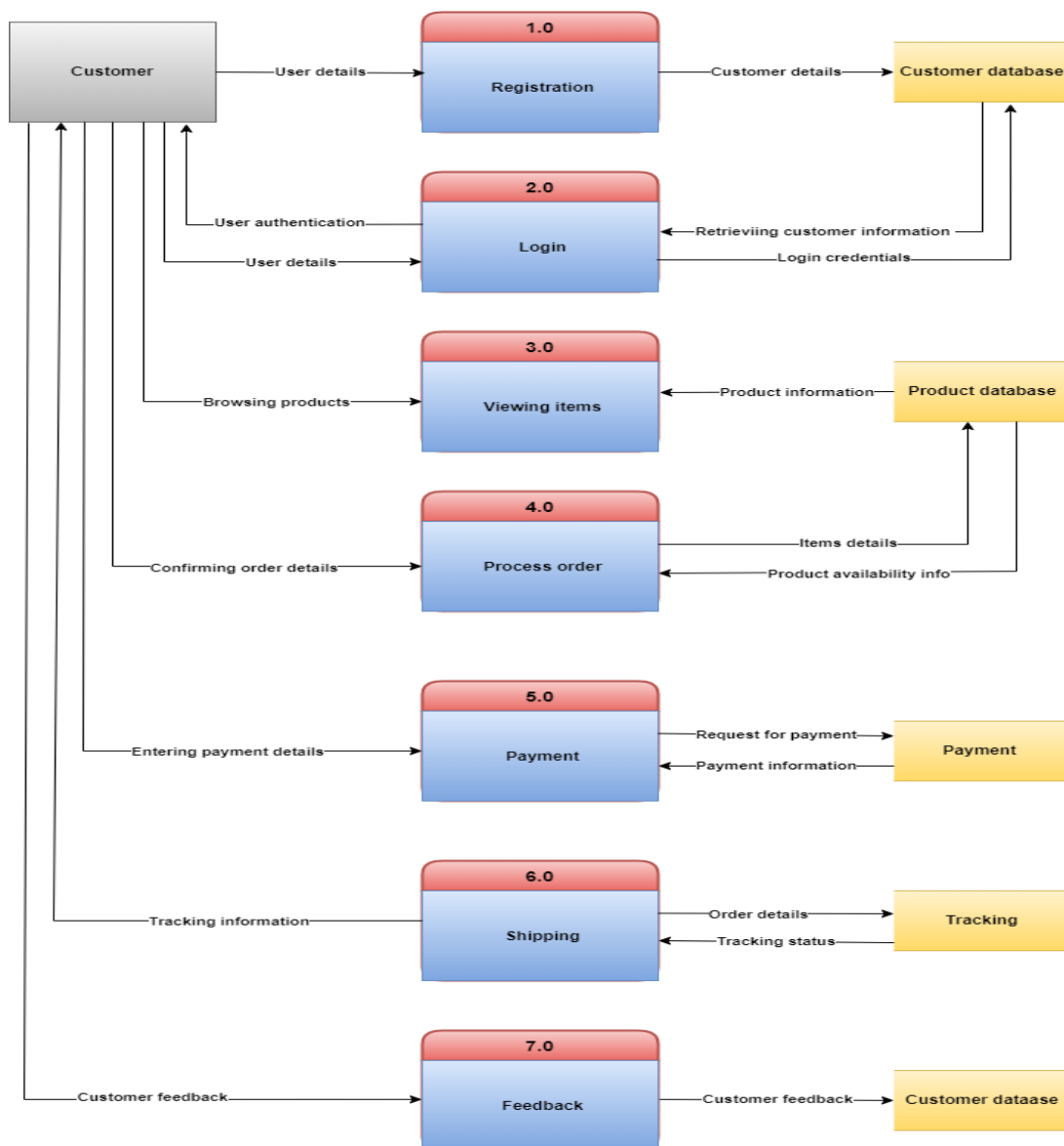


Fig 10: Level 1 diagram for Nykaa

The DFD levels are explained through table format explained below.

| |
|--|
| Process Description |
| Process ID: 1.0 |
| Process Name: Registration |
| <ol style="list-style-type: none"> 1. User must enter his/her details. 2. The user details must saved in customer database for further authentication. |

Table 1: Registration

| |
|--|
| Process Description |
| Process ID: 2.0 |
| Process Name: Login |
| <ol style="list-style-type: none"> 1. User has to enter his/her details for login and then user authentication will be followed. 2. If user enters correct details then login will be successful otherwise the webpage shows error message saying 'Enter valid credentials'. |

Table 2: Login

| |
|---|
| Process Description |
| Process ID: 3.0 |
| Process Name: Browsing |
| <ol style="list-style-type: none"> 1. After successful login user can browse the products. 2. Later user can add the item to cart or wish list. |

Table 3: Browsing

| |
|---|
| Process Description |
| Process ID: 4.0 |
| Process Name: Process order |
| <ul style="list-style-type: none"> • After selecting the chosen products user should enter the address details for shipment. |

Table 4: Process order

| |
|------------------------------|
| Process Description |
| Process ID: 5.0 |
| Process Name: Payment |

1. User has to choose the payment mode.
2. If user chooses debit card/credit card the user should enter card details then followed by payment.
3. If user chooses cash on delivery then he/his should pay to delivery person during delivery.

Table 5: Payment

| |
|---|
| Process Description |
| Process ID: 6.0 |
| Process Name: Shipment |
| <ol style="list-style-type: none"> 1. User can track the shipment. 2. Should ensure quick delivery. 3. No plastic while doing packing. |

Table 6: Shipment

| |
|--|
| Process Description |
| Process ID: 7.0 |
| Process Name: Feedback |
| <ol style="list-style-type: none"> 1. After successful delivery the customer should be prompt to add feedback. 2. The feedback should be saved in database and analyzed properly for better improvement. |

Table 7: Feedback

Entity Relation (ER) diagram for Nykaa

ER diagrams are used to create the relationships between tables. Each entity is considered has a table and attributes are considered as parameters. Nykaa online shopping system is explained through ER diagram. The operations should be followed by Login, Authentication, Product details, Order process, Payment and Shipping. This diagram is drawn to explain the shipment issue. There are different relations are present for Nykaa such as composition, inheritance, association and aggression rules.

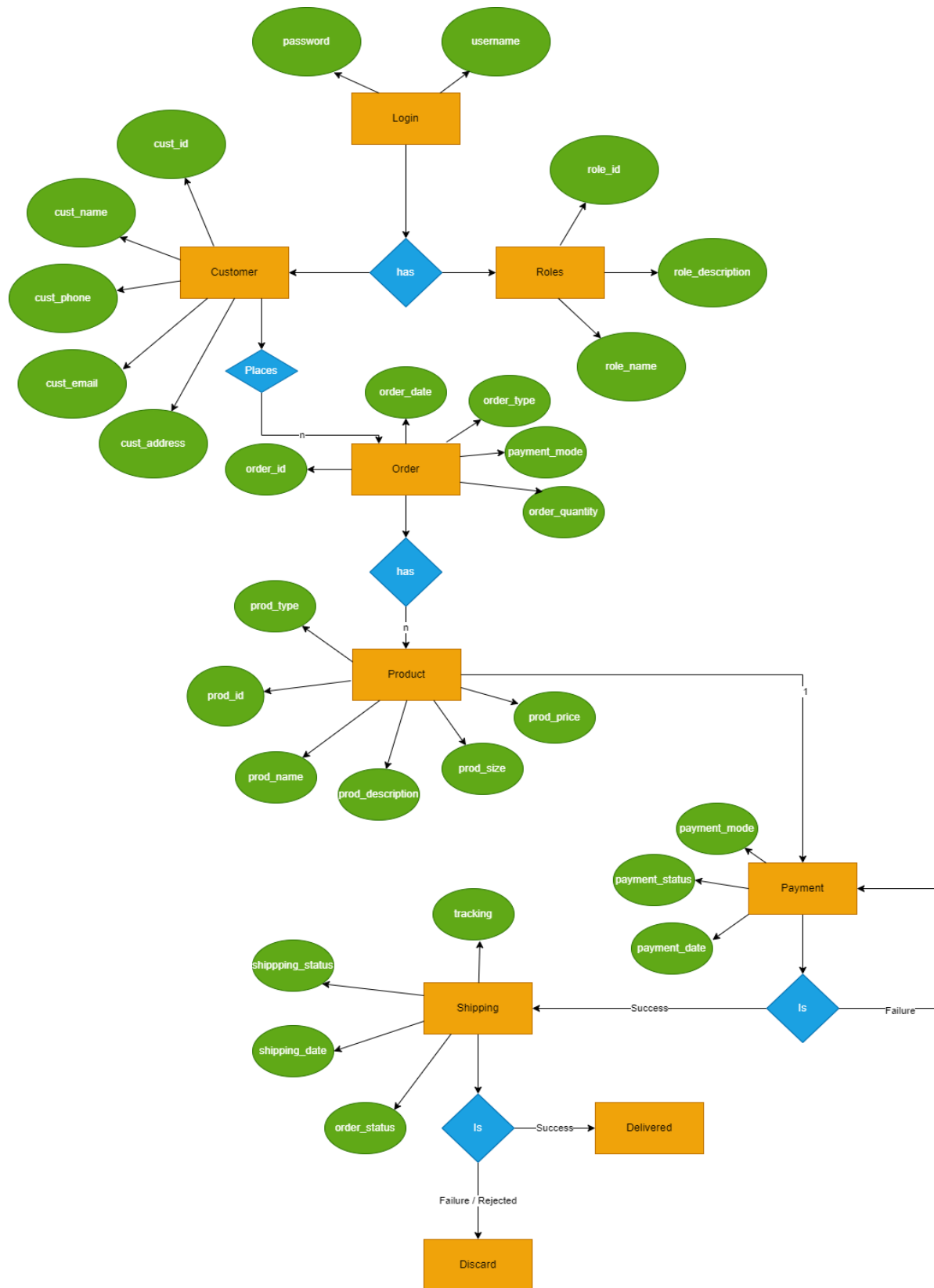


Fig 11: Entity relation diagram for Nykaa

Activity diagram

It is employed to outline business operations and record their execution. This diagram specially designed for exploring CRM issues like discount issue, customer service lack and poor feedback considerations. Nykaa should hire one CRM manager. The manager purpose is to login to service portal and then analysis the permissions of the cases.

The activity diagram shown below

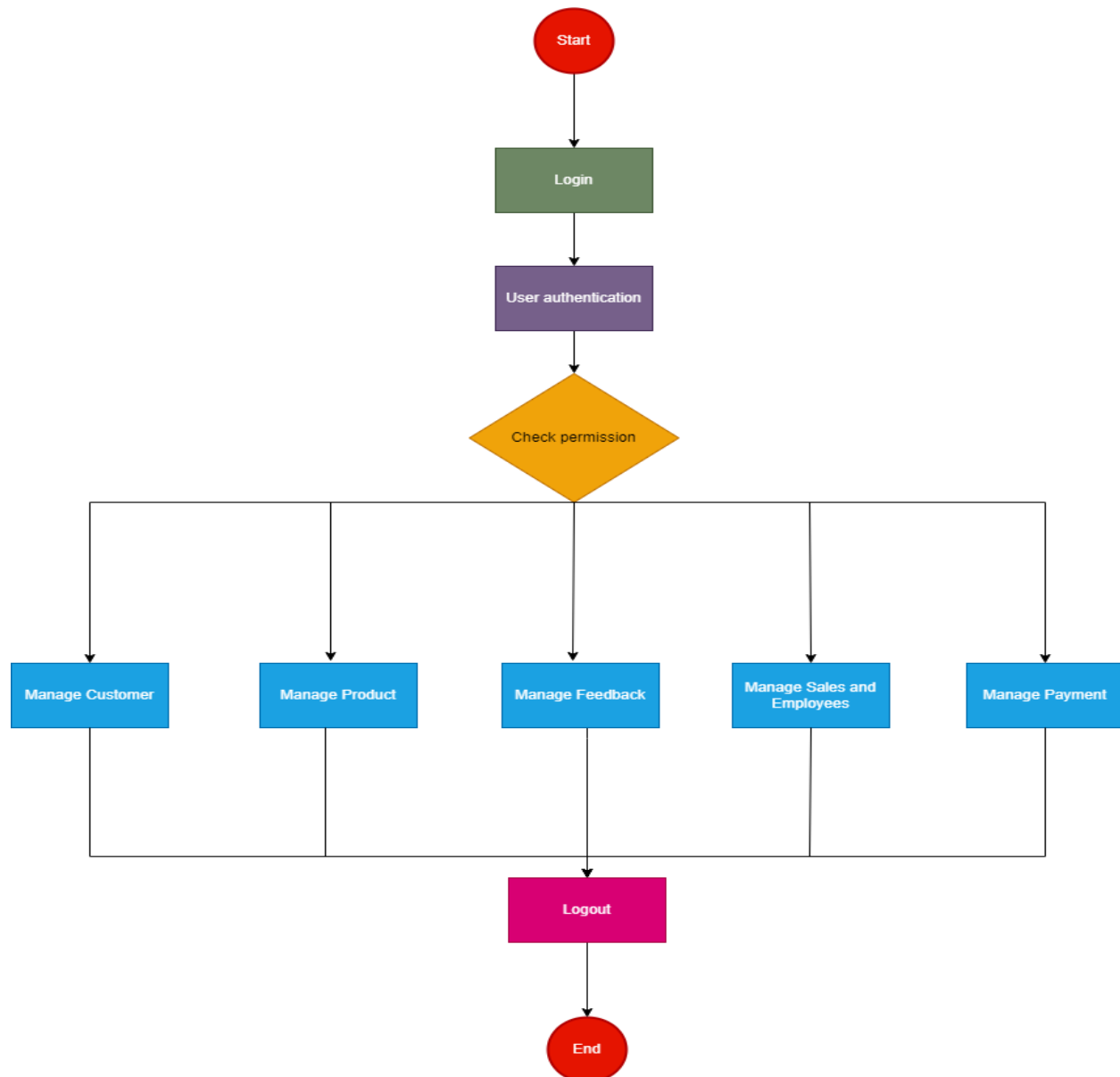


Fig 12: Activity diagram for CRM

Observation and Recommendation

The study of this research results that Nykaa has some positive sites and some negative. After analyzing Nykaa beauty site with various techniques like strategic analysis, consider perspectives, investigation situation, analyzing needs and defining solution it is found that Nykaa has some loyal customers but it is very small organizations with limited resources. By using SWOT and portal 5 force analysis it is found that Nykaa build with strong stake holders and their perspectives are explained with CATWOE and Power grid analysis. During COVID pandemic Nykaa lost many customers because of transport issue. The CATWOE analysis explained how customer and stakeholder perspectives are different. Customer always prefer better quality product with cheap price, but stakeholder wants profits by selling costliest products.

Nykaa uses a business model based on inventory and a content-driven marketing approach. All of its goods come straight from the original product or brand (Panthangi, 2017). An enormous collection of realistic, new goods and services are distributed by Nykaa throughout India (Bhel, 2016).

Rich picture is used to illustrates the entire Nykaa online system with process and later DFD helped to find found the data flow movements. The main purpose of using DFD is to analysis the feedback and discount issue. The issue and solutions are clearly arranged through the UML use case diagrams. The management team at Nykaa should consider how vital it is to satisfy customers' requirements in addition to making a profit.

UML use case, Activity diagrams and structured English all are used for representing business insights through pictorial way which will help non-professional to understand the business process.

Nykaa should maintain proper database where all the customer feedback should contain and take those feedback and consult their with better discounts to attract them. The resources available for Nykaa are less and it should expand their business globally. As per the records Nykaa sales decreased during COVID period because of shipment issue so, Nykaa should think about their transportation team and take action if necessary.

Part 2

Introduction

The purpose of this section is to analysis and take sales report for the business insights from the dataset using visualizations. The author gathered the dataset from external site called Kaggle and this dataset contains 610 rows and 17 columns. Kaggle is one of the big platforms for providing datasets. To analyze the data through visualizations, the author chooses Python programming language which is open source and easy to understand and learn. For the business insights author used some inbuilt functions called Numpy, Pandas and stats for statistical analysis. Through seaborn, matplotlib and pyplot libraries the visualizations are done effectively.

Reading the data from .csv file through pandas and stored in a variable for analysis shown below

```
In [1]: # Importing required libraries
import pandas as pd
import numpy as np
import matplotlib.pyplot as plt
from scipy import stats
%matplotlib inline
import seaborn as sns
```

Step 2 : Reading the data set and allocating it to the variable

Whenever google colab is used the following two lines code should be uncommented.

```
In [3]: # Mounting Google drive to Google Colab

#from google.colab import drive
#drive.mount('/content/drive')

In [4]: # Moving to that particular directory
#%cd "/content/drive/My Drive/Colab"

In [2]: # Reading the file
nykaa_df = pd.read_csv('Nykaa_Product_Review.csv')
```

Fig 13: Reading the file

The describe function is used to get the all the statistical values for the data frame.

```
In [10]: # Finding descriptive analysis for the data frame.
nykaa_df.describe()
```

Out[10]:

| | Product Price | Product Rating | Product Reviews Count | Expected Category Count | Expected Brand Count |
|-------|---------------|----------------|-----------------------|-------------------------|----------------------|
| count | 610.000000 | 551.000000 | 551.000000 | 610.000000 | 610.000000 |
| mean | 1019.014754 | 4.248457 | 364.891107 | 485.768852 | 121.144262 |
| std | 1352.519277 | 0.492113 | 1072.694529 | 667.910666 | 251.212381 |
| min | 25.000000 | 1.000000 | 0.000000 | 0.000000 | 0.000000 |
| 25% | 180.000000 | 4.100000 | 3.000000 | 0.000000 | 0.000000 |
| 50% | 447.000000 | 4.300000 | 22.000000 | 237.000000 | 0.000000 |
| 75% | 1307.500000 | 4.500000 | 146.000000 | 725.750000 | 131.000000 |
| max | 9500.000000 | 5.000000 | 8513.000000 | 3484.000000 | 1530.000000 |

The describe function is used to find the statistical values for the entire data set columns such as mean, count, standard deviation, minimum value, lower quartile, median, upper quartile and maximum value.

Fig 14: Describing the dataset

Data cleaning

As part of the assignment this concept is not necessary but for the better way of analyzing the given data set, this data pre-processing is very important. First check for null values and if there are any values then they need to be dropped or injected with mean or median or zero.

Handling Missing / null / irregular information

If there are null values from the set then for removing those we are using dropna function which deletes entire row which has Nan values.

```
In [15]: nykaa_features = nykaa_df[['Product Brand', 'Product Category', 'Product Description', 'Product Price', 'Product Reviews Count',
```

```
In [16]: nykaa_features.isna().sum()
```

```
Out[16]: Product Brand      0
Product Category    81
Product Description  0
Product Price       0
Product Reviews Count  59
Product Rating      59
dtype: int64
```

```
In [17]: nykaa_features.dropna(inplace=True)
```

C:\Users\USER\AppData\Local\Temp\ipykernel_6988\1007916746.py:1: SettingWithCopyWarning:
A value is trying to be set on a copy of a slice from a DataFrame

See the caveats in the documentation: https://pandas.pydata.org/pandas-docs/stable/user_guide/indexing.html#returning-a-view-versus-a-copy
nykaa_features.dropna(inplace=True)

After removing null values then check for Nan values again.

```
In [18]: nykaa_features.isna().sum()
```

```
Out[18]: Product Brand      0
Product Category    81
Product Description  0
Product Price       0
Product Reviews Count  0
Product Rating      0
dtype: int64
```

Fig 15: Handling null values

As per the above picture it clear that there are some null values and author dropped entire row using drop function. The reason for dropping entire row is because Nan values is no longer useful for analyzing the data so instead of injecting author chose to drop. For parameter consistency all the columns should be in same data type.

Business insights and Observations

After performing data reading, data cleansing, and statistics discovery, Exploratory Data Analysis (EDA) has emerged as the primary concept for understanding business insights. In this part, the author goes over Nykaa's best-selling brands, products, item categorization, and locating product components.

Relation between Product Rating and Price:

As per the results the highest price products are less rated compared to the lowest products. Customers are purchasing products which are low price, and they are satisfied with the product quality as they high rating.

Step 4 : Visualizations

Visualizations are the pictorial representation of the data which can be easily understand by end user without any difficulties.

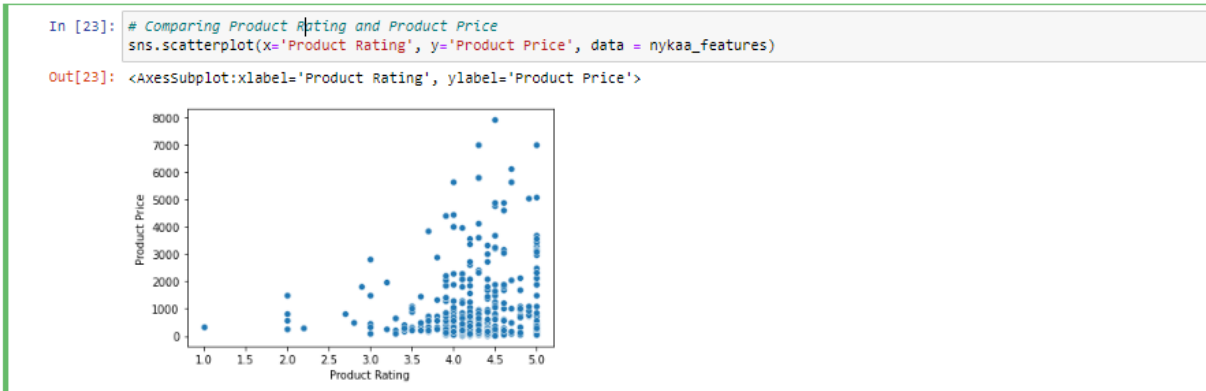


Fig 16: Product Price vs Rating

Relation between product brand and quantity:

The below picture illustrates which brand products are more popular in market.

```
In [57]: # Plotting product brand versus quantity
sns.set(rc = {'figure.figsize':(12,10)})
a = sns.barplot(data = df_nykaa, x='Qty', y='Product Brand', color = None)
a.set_title('Top 10 brands of Nykaa')

Out[57]: Text(0.5, 1.0, 'Top 10 brands of Nykaa')
```

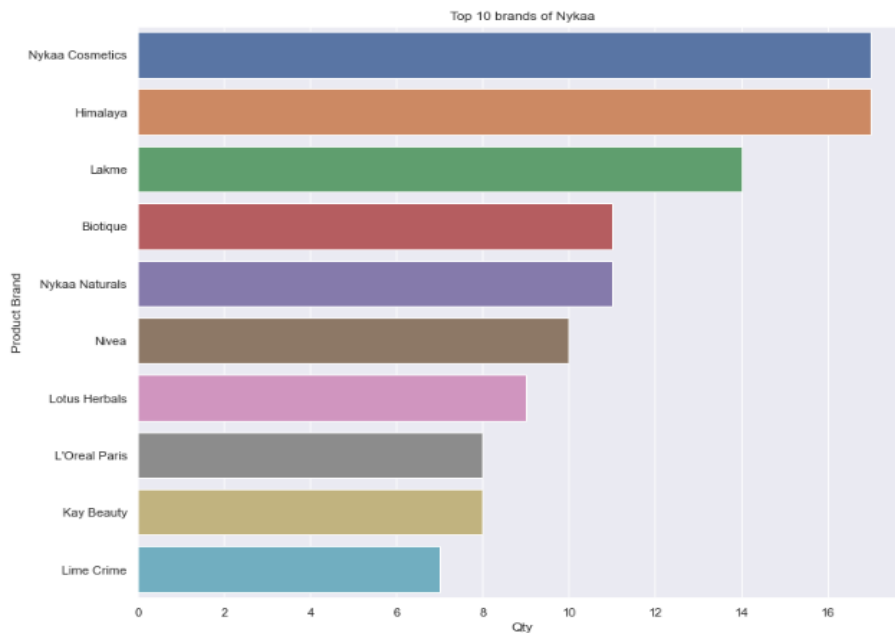


Fig 17: Product brand vs quantity

As per the results Nykaa Cosmetics are more popular in the market along with Himalaya products. The least sold brand is Lime crime which is American cosmetic brand.

Finding costliest brands:

By using seaborn plot, the author found the costliest brand which shown in below.

```
In [75]: # Ordering the product brand based on the price
sns.set(rc = {'figure.figsize':(15,9)})
a = sns.barplot(data = nykaa_no_duplicates, y = 'Product Brand', x = 'Product Price')
a.set_title("Most costliest Brands of Nykaa")

Out[75]: Text(0.5, 1.0, 'Most costliest brands of Nykaa')
```

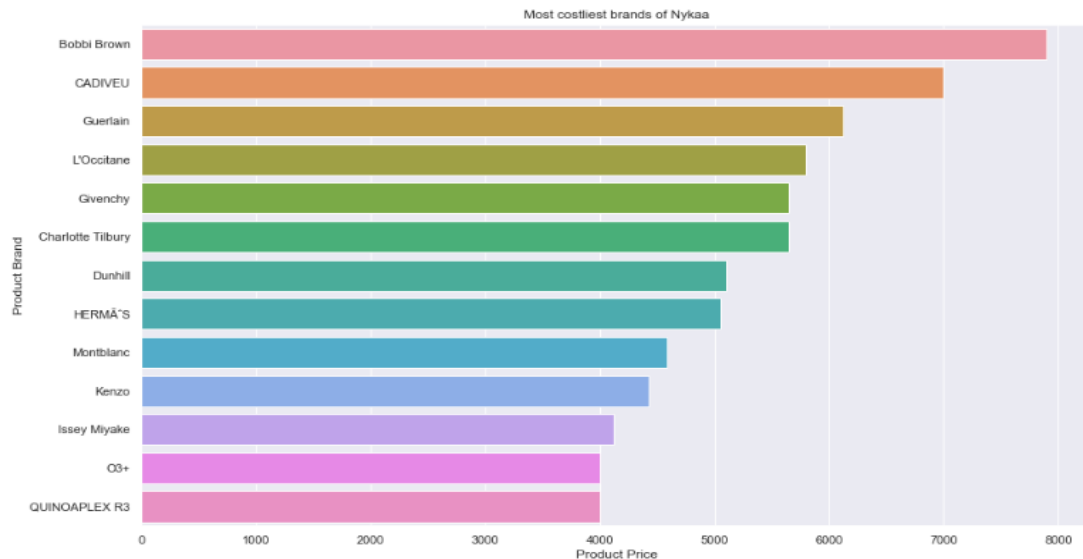


Fig 18: Costliest brands of Nykaa

The costliest brand among all of them is Bobbi Brown (Rs.8000) and low-price brand is Quinoaplex R3 with 4000 rupees.

Finding Ratings for the products

Rating is one which represents the product quality by customers. Based on the rating sales team can analysis the products like which is selling high or do we need to increase the product sale or do we need to look into product quality etc,. Question answers can be noted. Researcher analyzed the quality of the product through the rating column.


```
In [76]: nykaa_df_rating = nykaa_df1.sort_values(by=['Product Rating', 'Product Price'], ascending=False)
nykaa_df_rating
```

Out[76]:

| | Product Brand | Product Price | Product Rating |
|-----|--------------------|---------------|----------------|
| 378 | CADIVEU | 7000.0 | 5.0 |
| 326 | Dunhill | 5100.0 | 5.0 |
| 507 | Burberry | 3880.0 | 5.0 |
| 28 | Burberry | 3880.0 | 5.0 |
| 543 | PRADA | 3569.0 | 5.0 |
| ... | ... | ... | ... |
| 183 | Paese Cosmetics | 1499.0 | 2.0 |
| 134 | IsaDora | 810.0 | 2.0 |
| 113 | As-It-Is Nutrition | 576.0 | 2.0 |
| 142 | First Water | 269.0 | 2.0 |
| 208 | Ellement Co. | 325.0 | 1.0 |

486 rows x 3 columns

Fig 19: Rating variable assign

```
In [81]: # finding ratings using for loop
c = one_star = two_star = three_star = four_star = five_star = 0
for row in nykaa_df_rating.iterrows():
    c+=1
    if (row[1][2]==5.0):
        five_star+=1
    if (row[1][2]>=4.0 and row[1][2]<5.0):
        four_star+=1
    if (row[1][2]>=3.0 and row[1][2]<4.0):
        three_star+=1
    if (row[1][2]>=2.0 and row[1][2]<3.0):
        two_star+=1
    if (row[1][2]>=1.0 and row[1][2]<2.0):
        one_star+=1
```

Star rating in each category

```
In [82]: # Count of each stars
ratings_nykaa_df=pd.DataFrame({
    'Stars':['Five Stars','Four Stars','Three Stars','Two Stars','One Stars'],
    'Count':[five_star, four_star, three_star, two_star, one_star]
})
ratings_nykaa_df
```

Out[82]:

| | Stars | Count |
|---|-------------|-------|
| 0 | Five Stars | 47 |
| 1 | Four Stars | 356 |
| 2 | Three Stars | 74 |
| 3 | Two Stars | 8 |
| 4 | One Stars | 1 |

Fig 20: Star rating count

Based on the above table the four_star rating is more and then three star which means people are satisfied with the products and one_star rating is low.

Top 10 categories

There are multiple beauty products categories offered by Nykaa, out of those the 10 categories are listed below.

```
In [88]: # Keeping category and price in a new dataframe
nykaa_cat_df = nykaa_features[['Product Category', 'Product Price']]
nykaa_cat_df
```

```
Out[88]:
```

| | Product Category | Product Price |
|-----|---|---------------|
| 0 | Makeup > Face > Contour | 600.0 |
| 1 | Brand > L'Oreal Paris | 454.0 |
| 2 | Makeup > Face > Foundation | 1395.0 |
| 3 | Health & Wellness > Good for You > Super Food | 175.0 |
| 4 | Makeup > Lips > Lip Stain | 539.0 |
| ... | ... | ... |
| 603 | Natural > Types of Skin > Combination Skin | 274.0 |
| 605 | Makeup > Nails > Nail Polish | 1000.0 |
| 606 | Makeup > Eyes > Under Eye Concealer | 665.0 |
| 608 | Makeup > Makeup Kits > Eye Palettes | 675.0 |
| 609 | Makeup > Makeup Kits > Customize Your Palette | 1100.0 |

486 rows x 2 columns

```
In [89]: # As the category contains group so splting for deeper analysis
item = nykaa_cat_df['Product Category'][0]
word_array = item.split(" ")
# Printing the array
print(word_array)
# Printing the required value
print(word_array[-1])
```

```
['Makeup', '>', 'Face', '>', 'Contour']
Contour
```

Fig 21: Categorizing the product

```
In [96]: # Plotting the graph
sns.set(rc = {'figure.figsize':(8,8)})
# Sorting the values by price
df_items = makeup_df_items.sort_values(by = 'Product Price', ascending = False)

# Taking top 10 categories
b = sns.barplot(data = df_items[0:10], x = 'Product Price',y = 'Item')
# Title assign
b.set_title('Listing product categories by Price ')

Out[96]: Text(0.5, 1.0, 'Listing product categories by Price ')
```

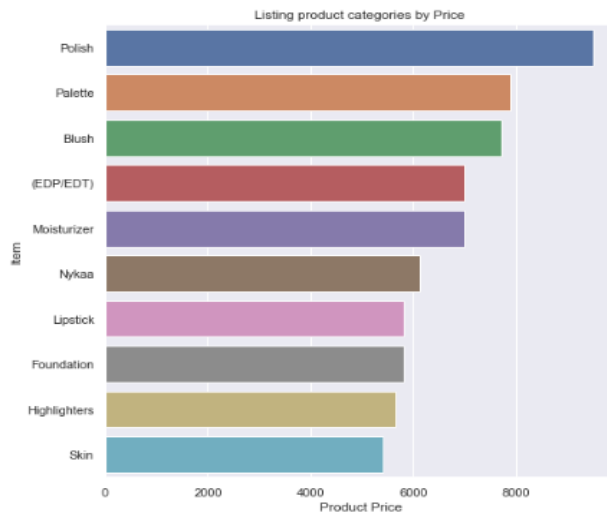


Fig 22: List of products based on category ascending by price

Polish is the top-rated category and Skin related items are under low price section.

Higher sold Products categories

By using barplot the author found the top 15 sold products which shown below.

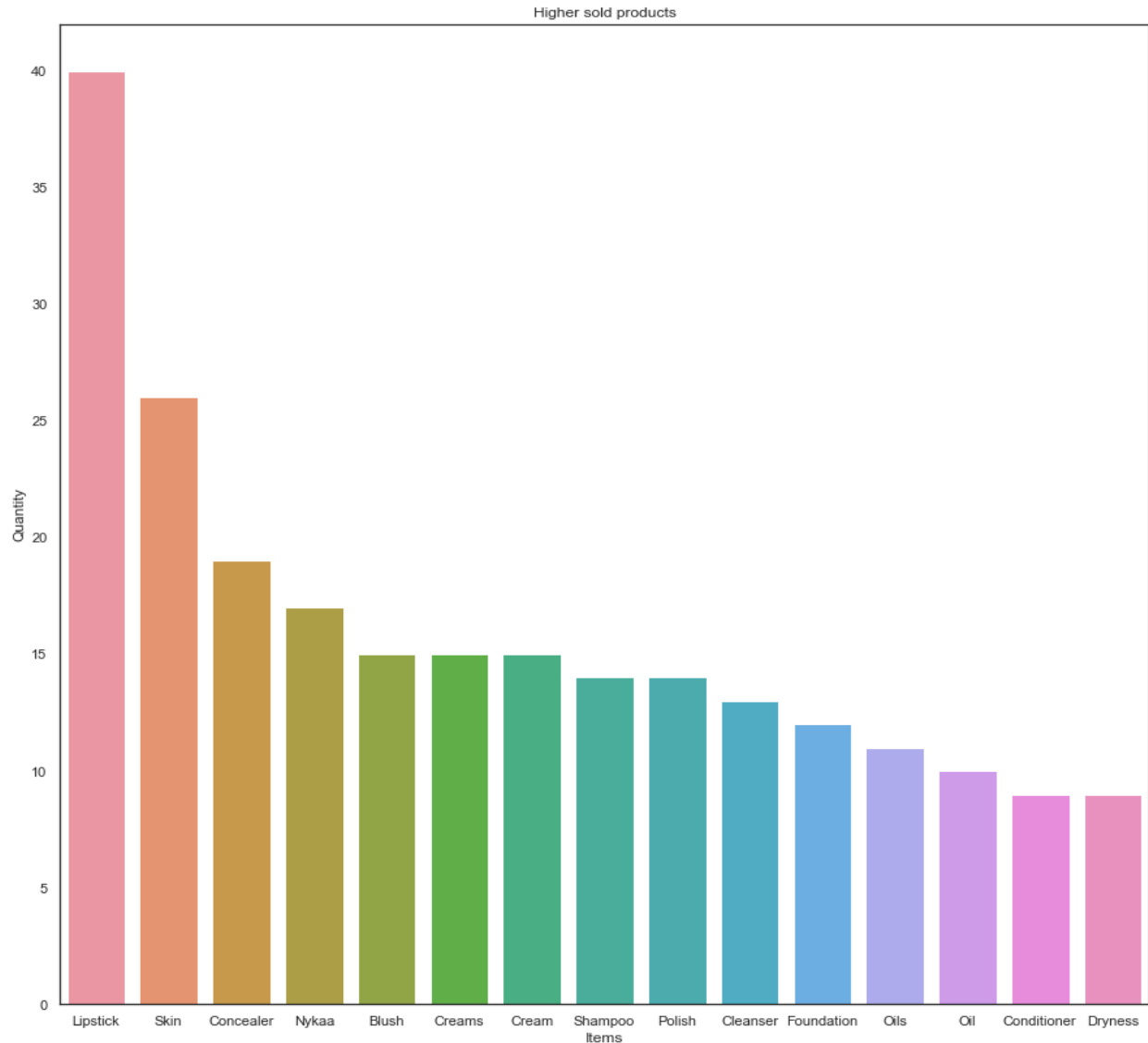


Fig 23: Bar plot for Items category

The most sold product is Lipstick because women preferred lipstick first out of all the makeup.

Highest available component in Nykaa products is *Phenoxyethanol* which is used for synthetic preservative with concentration 1% and it has global approval.

The visualization is below:

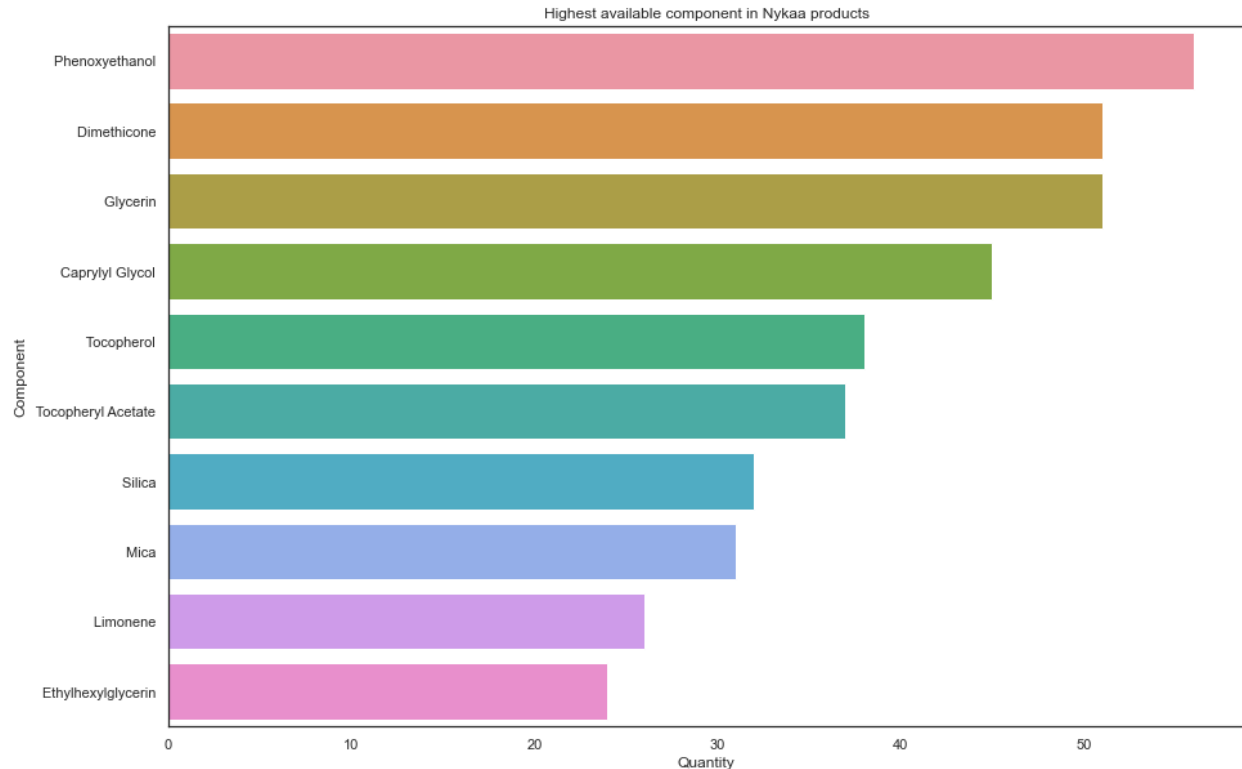


Fig 24: Highest available component in Nykaa products

Conclusion and Recommendations

After performing EDA Nykaa products have higher quality and selling popular brands. The ratings got from customers are good but very less people given five-star rating which means Nykaa must improve the quality of the products. Nykaa should consider the feedback from customer and assign it to the team for further analysis so that they can find their issues in the products and can improve them. Nykaa fashion selling top brands in India which makes the sales growth better. E-commerce industry concentration on attracting customers which can be done through many ways and Nykaa also following a way for attracting customers through maintain their site more interactive. It compares with other beauty markets and selling specified user-friendly protected products. The components used in the items also very safe which made Nykaa best online shopping system.

As per the research Nykaa is small Business compared to Amazon and Flipcart. Nykaa is specially concentrating on women beauty products more than men, if it increases men beauty products also the sales would increase more along with demand. Nykaa should think about the global expansion quickly so that it will become top 10 E-commerce site globally. Since there is less data in this dataset, the author was unable to identify every feature. To better estimate future sales, machine learning can be used. As per the records Nykaa sales decreased during COVID period because of shipment issue so, Nykaa should think about their transportation team and take action if necessary.

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Appendix

Data Source

[https://www.kaggle.com/datasets/susant4learning/nykaacosmeticsproductsreview2021?select=Nykaa Product Review](https://www.kaggle.com/datasets/susant4learning/nykaacosmeticsproductsreview2021?select=Nykaa+Product+Review).