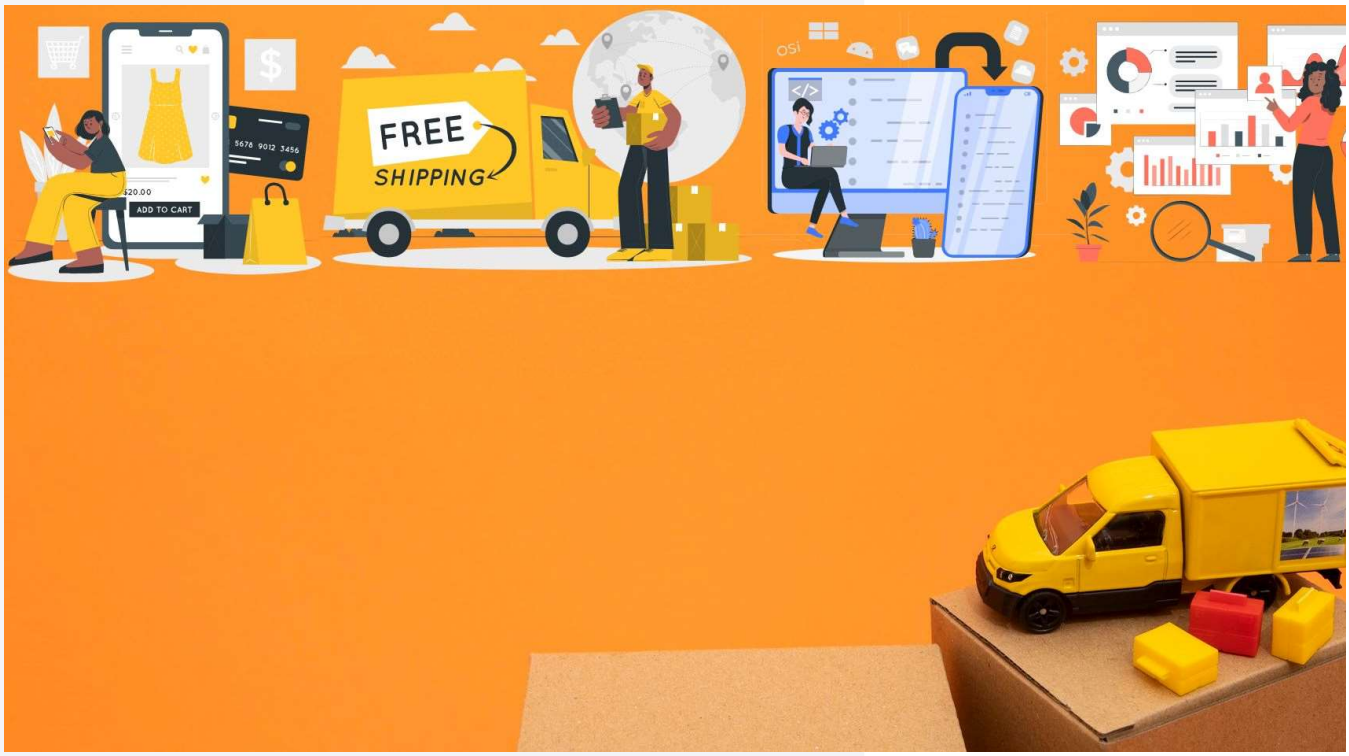
SALES-SHIPMENT ANALYSIS

BY TEAM TECH ORCAS



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Introduction

Embarking on a transformative journey, we created a sophisticated end-to-end application designed to revolutionize the way sales and shipping details are analyzed and managed. This application is being crafted to function as an all-encompassing platform that caters to both customers and staff, to substantially improve the efficiency of order processing and the overall delivery experience. It encompasses two primary modules - operational and analytical. On the operational front, the application is geared towards capturing valuable customer feedback on their orders and providing personalized product recommendations through customer dashboards. The analytical component is engineered to dissect data dynamically, uncovering pivotal insights such as time-based order volumes, the status of deliveries, product categories, and geographic sales distribution, all of which are crucial for informed strategic planning.

Motivation

Recognizing the importance of customer feedback and operational transparency, we've created a platform that empowers users with order tracking capabilities and feedback system and provides staff with robust order management tools.

Data Source

1. Data Source: - **E-Commerce Sales Dataset** Link: https://www.kaggle.com/datasets/thedevastator/unlock-profits-with-e-commerce-sales-data?select=Sale+Report.csv
2. Mockaroo: https://www.mockaroo.com/ (For names, addresses, Phone Numbers and Emails)
3. CHAT GPT When required for cross checking.

Application Design

For the development of our application, we've employed a robust suite of technologies:

- **Python**: Serves as the core programming language.
- **MySQL Workbench**: Our chosen database design tool, allowing for sophisticated ERD (Entity-Relationship Diagram) modeling to structure our database efficiently.
- **PyQt Designer**: Enhances our ability to craft intuitive user interfaces for a seamless user experience.

Our application's functionality is further enriched by integrating several additional Python libraries:

- **Pandas**.
- **Sklearn**
- **PyQt5**

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Operational Module

- **Customer**

The operational module of the application is a customer-centric interface designed to enhance the user experience post-purchase. It includes features that allow customers to:

1. Track Orders: Customers can follow the journey of their purchase from warehouse to delivery, with real-time updates on the progress of their orders.

2. Provide Feedback: A feedback system is integrated into the order tracking page, enabling customers to rate their satisfaction with the product and delivery service. This feedback is vital for continuous improvement.

3. Personalized Recommendations: The system analyzes past purchases and browsing behaviors to offer individualized product suggestions, encouraging repeat business and increased customer engagement.

- **Staff**
  1. For staff, the operational module equips them with tools to: Update Order Status: If there are exceptions such as delays, damages, or lost items, staff can update the order status to keep customers informed.

Basically, we have developed this app mainly for companies which do not have their own shipment service. By enabling these businesses to track and update their order delivery status, this app addresses a critical aspect of e-commerce and logistics sectors.

Analytical Module

The analytical dashboards will provide a comprehensive overview of sales and shipping metrics, crucial for driving business growth and strategic decisions. Through the visualization of data, these dashboards offer insights into customer purchasing behaviors, product performance, and logistical efficiency.Business Questions:

1. Trend Analysis: What are the trends in order and SKU counts over time, and how do this correlate with sales and marketing activities?

2. Order Status Monitoring: How does the distribution of order statuses (shipped, pending, canceled) vary over time, and what can be inferred about the efficiency of the fulfillment process?

3. Product Performance: Which product categories are performing the best in terms of order count, and how does this align with inventory levels?

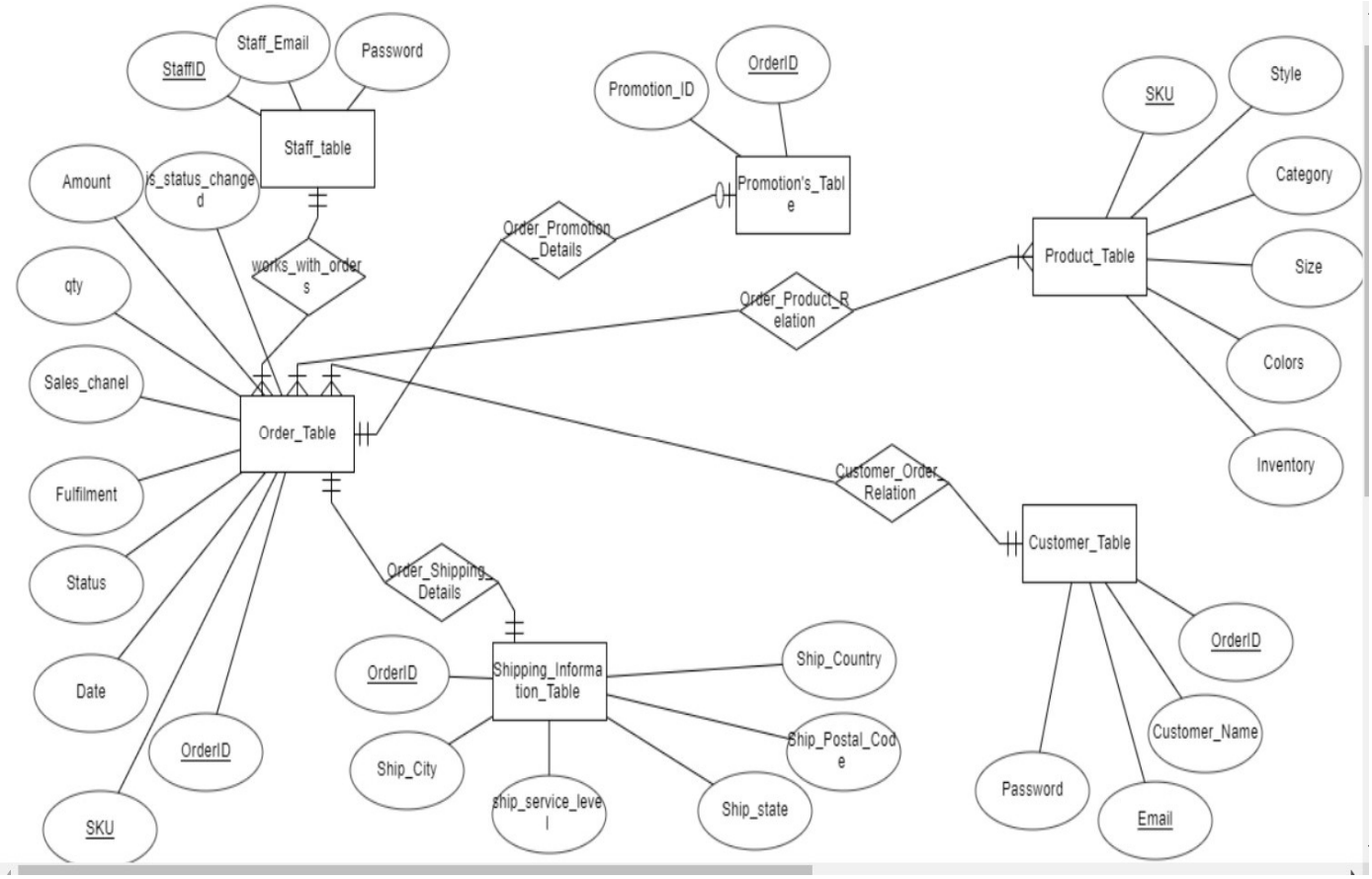
4. Geographic Sales Insights: Which states are generating the most sales, and how might this influence regional marketing strategies and inventory distribution?

5. Customer Preferences: Based on the frequently purchased products and categories, what are the emerging customer preferences, and how can this information be used to tailor future product offerings?

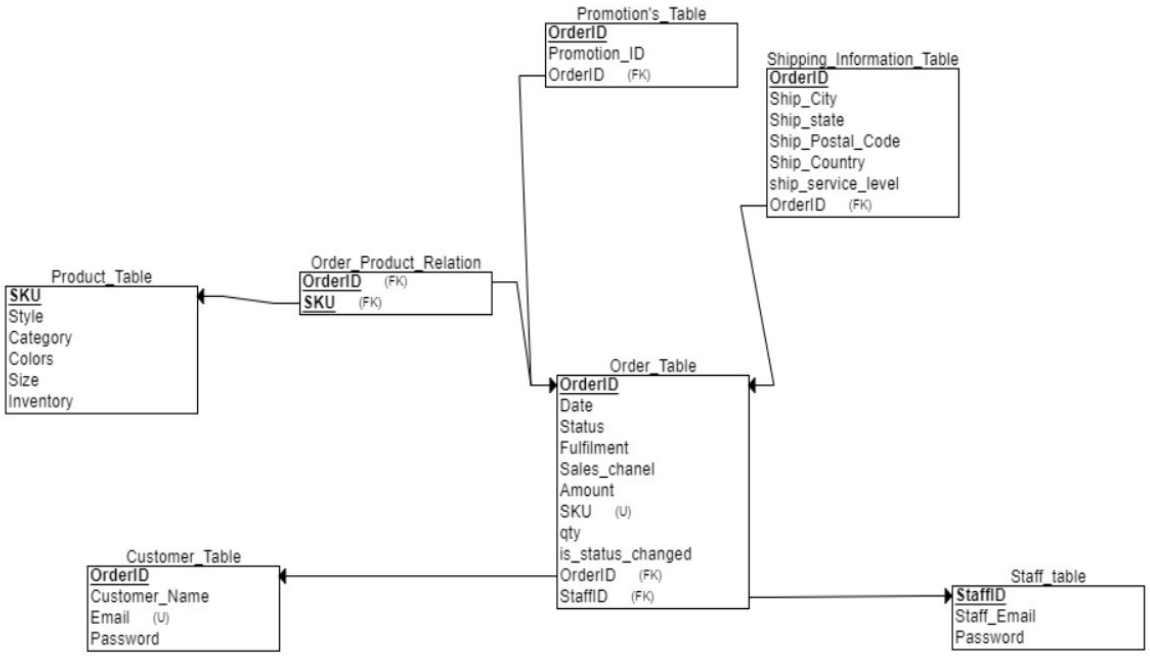
These dashboards empower the business with data-driven insights to fine-tune operations, customize marketing efforts, forecast demand, and enhance customer service.

Database Design

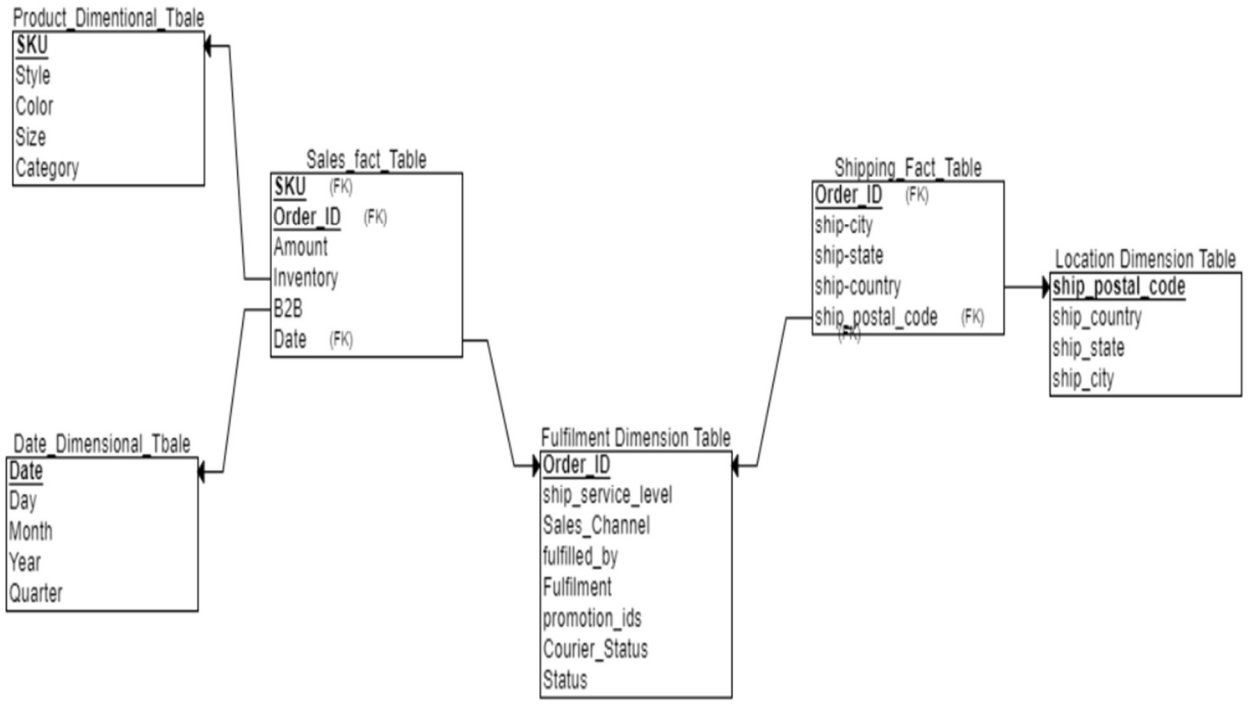
Our database is meticulously constructed to embody a robust data architecture, prioritizing normalized forms to maintain data integrity and facilitate scalability. It is structured to capture and store the most recent 30 days of operational data, ensuring that the day-to-day management reflects the latest trends and transactions. For analytical purposes, the database archives and processes historical data from the past three months, enabling comprehensive analysis and strategic planning. This approach ensures that our system is not only resilient and efficient but also provides a solid foundation for data-driven decision-making and operational excellence.



Our data analysis framework employs precise slicing and dicing operations for targeted data examination, complemented by drill-down capabilities for detailed insights. We ensure fine granularity is maintained for depth and clarity. The ETL process leverages Python and SQL to seamlessly transition data from operational to analytical stages, upholding data integrity and relevance.



Relational Schema



Star Schema

Working on Operational Module

The operational module of the application focuses on enhancing post-purchase user experience and staff efficiency. For customers, it offers features like order tracking with real-time updates, an integrated feedback system, and personalized product recommendations based on past purchases and browsing behavior. This customer-centric interface encourages repeat business and engagement. Staff, on the other hand, are equipped with tools for updating order statuses, especially in cases of delays or issues, ensuring customers stay informed. This module effectively streamlines the interaction between customers and staff, optimizing the overall process of order management and customer satisfaction.

Operational Database:

Relational Schema Overview:

The relational schema provided outlines the structure of an operational database designed to handle order processing and customer management for a business. The tables and their relationships are constructed to enable efficient data retrieval for daily operations.

Tables Overview:

- Order_Table: This is the central table, capturing details about each order, including ID, date, status, and fulfillment specifics.
- Product_Table: Contains details on each product, such as SKU, style, category, colors, size, and inventory count.
- Customer_Table: Stores information about customers, such as names and contact details, linked to orders they have placed.
- Staff_Table: Holds data on staff members, including their involvement with specific orders.
- Promotion's_Table: Manages promotional details that can be associated with orders.
- Shipping_Information_Table: Contains detailed information about shipping logistics for orders.
- Order_product_Table: This is the bridging table between order table and product table.

Relationships:

- Order_Table has a one-to-many relationship with Product_Table and Customer_Table, indicating that each order can include multiple products and a single customer can place multiple orders.
- Staff_Table to Order_Table also reflects a one-to-many relationship, as staff members can work on multiple orders.
- Promotion's_Table and Shipping_Information_Table are related to Order_Table, suggesting that each order may have associated promotions and shipping details.

Data Flow:

Orders are logged in the Order_Table, with product details fetched from Product_Table and customer details from Customer_Table. Staff interactions with orders are tracked via Staff_Table. Promotional details and shipping information are linked to each order, facilitating comprehensive tracking and management of the order lifecycle.

This schema supports a robust operational database system, ideal for managing complex order and customer relations, with a focus on maintaining detailed records of products, staff assignments, promotions, and shipping.

Specifications and Usability of Operational Module

1. Main Login Page

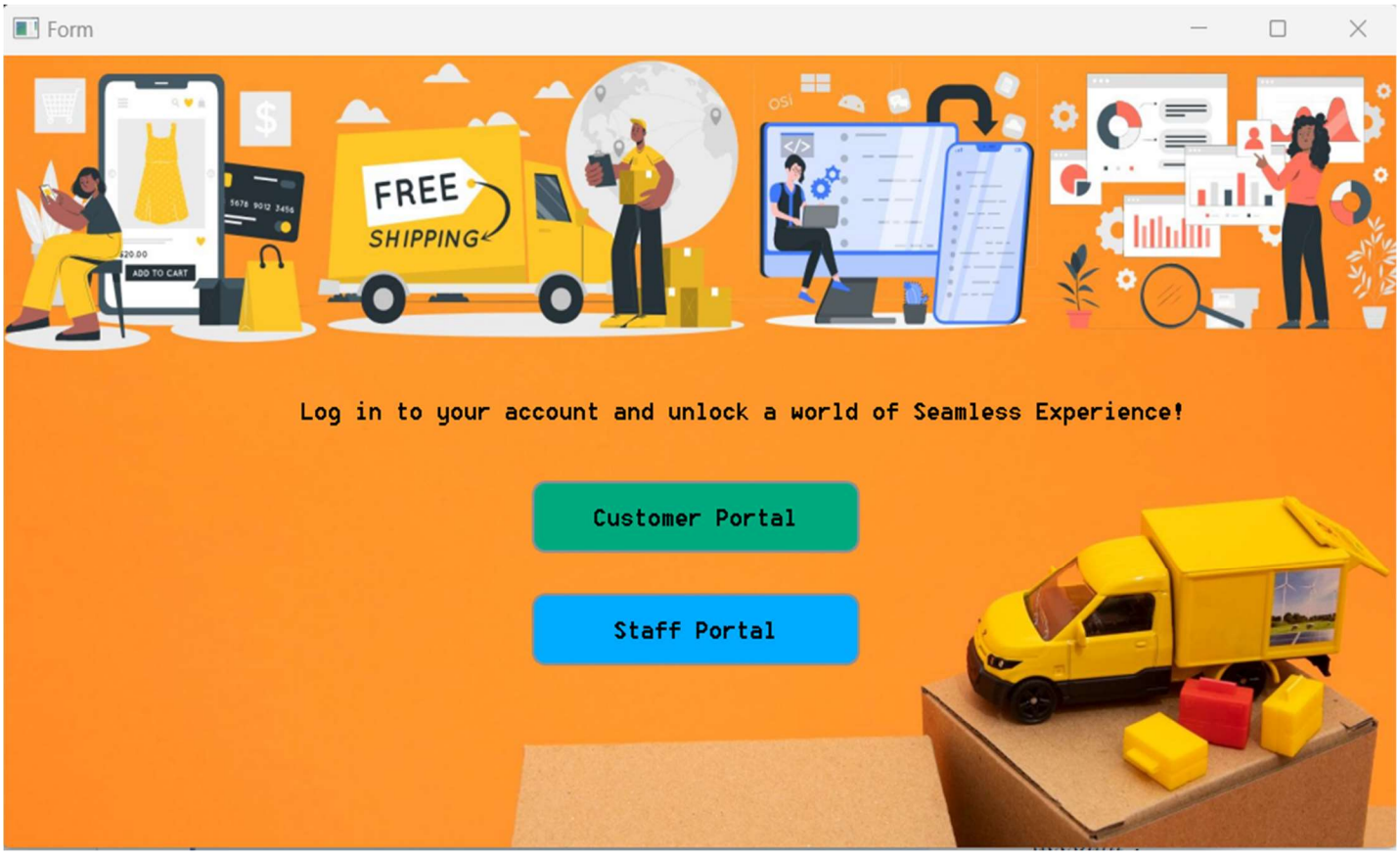


Fig1. Main Login Page

- This is App's main login page. We have two types of users.
- If the user is a customer, they can login with customer portal.
- If the user is staff, they can login with staff portal.

2. Customer Login Page

- A customer can login through an existing account if he has already a registered account.
- User can go through create a new account if he wants to create a new one.

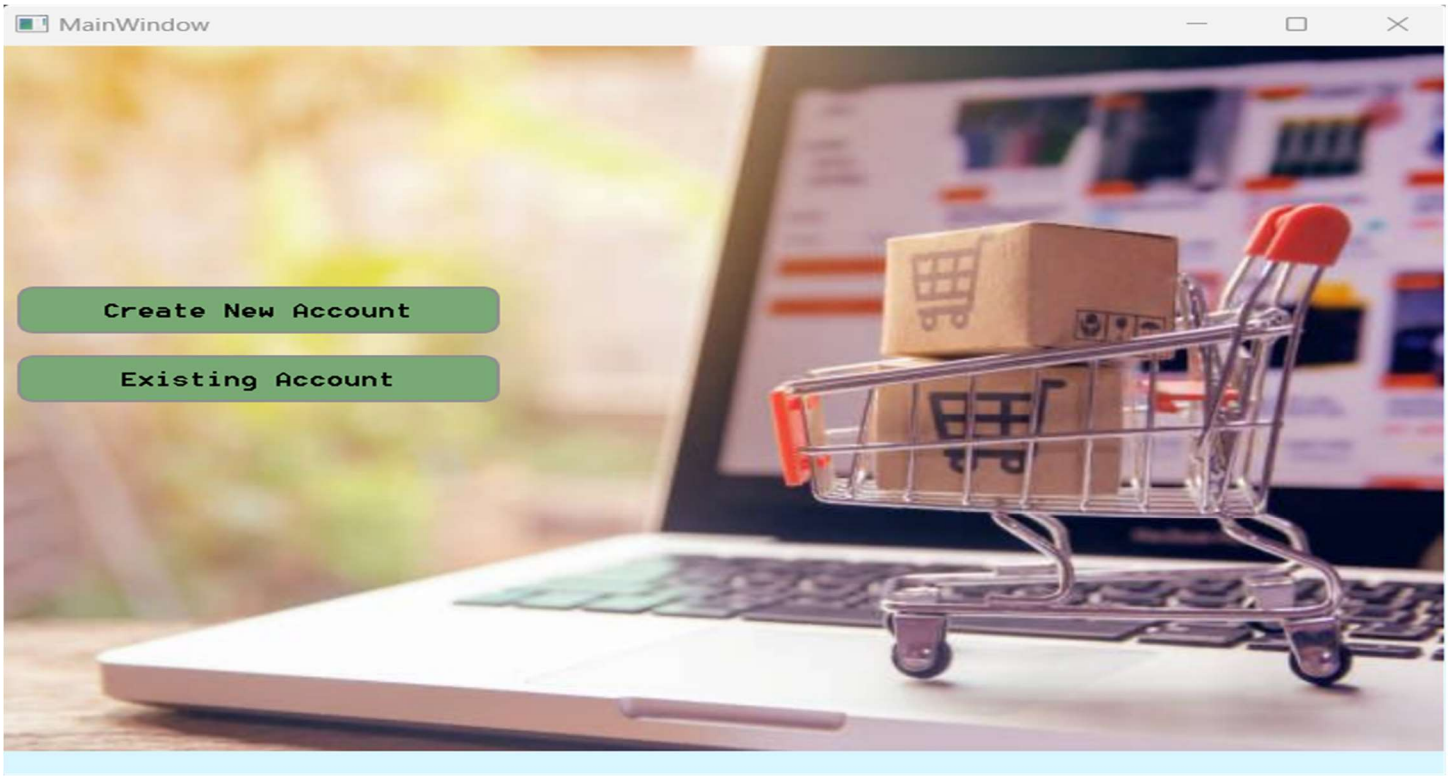


FIG2. LOGIN PAGE FOR CUSTOMER

3. Creating a new account:

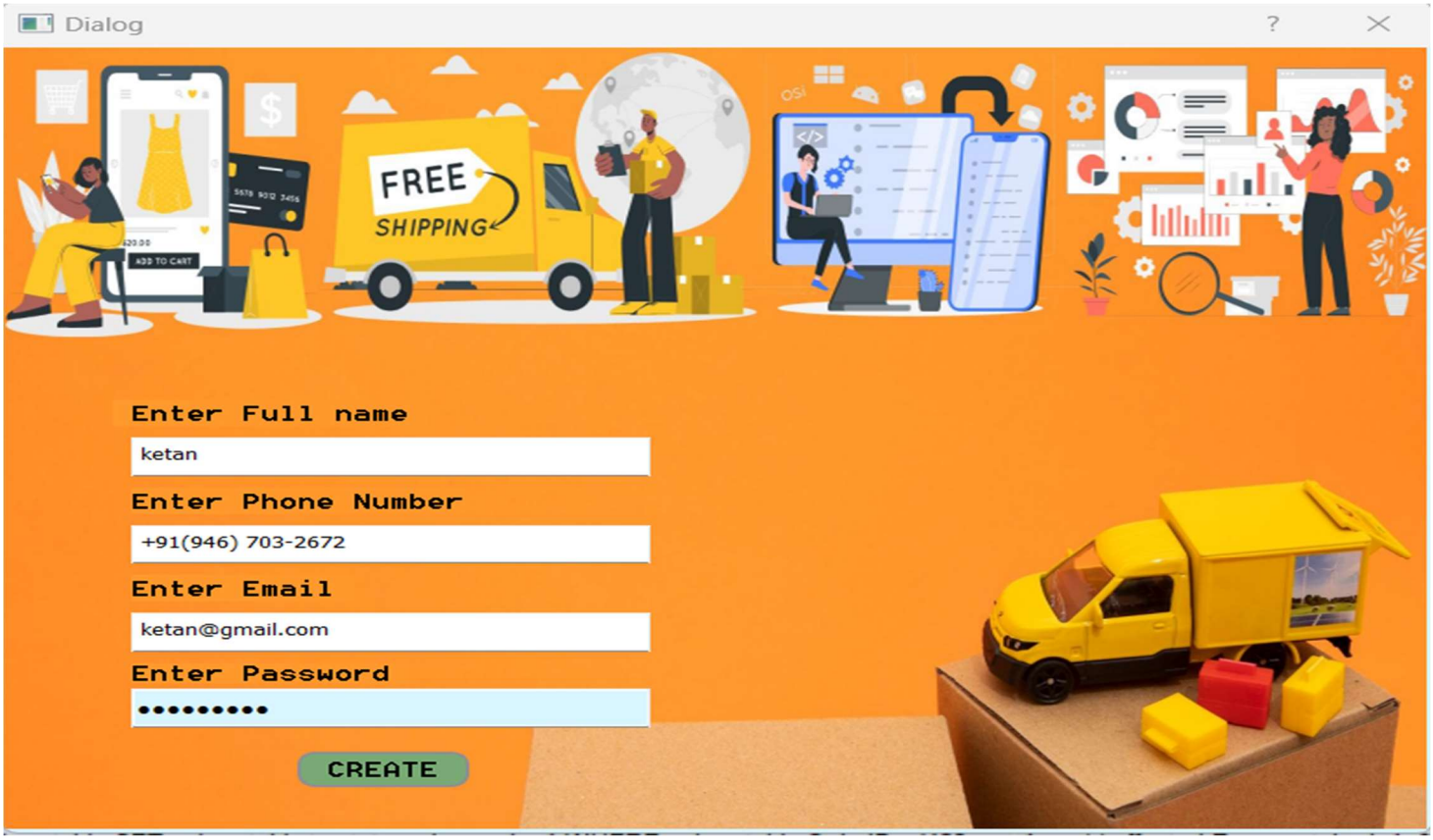


Fig3. Creating a new account

- After selecting create a new account it will take to new page where user can personalize and create an account.
- Here we have created an account for the user name “Ketan”.
- We modelled and built a user registration system using email.
- Passwords are securely hashed & stored using argon2 hasher.

4. Existing customer login Page

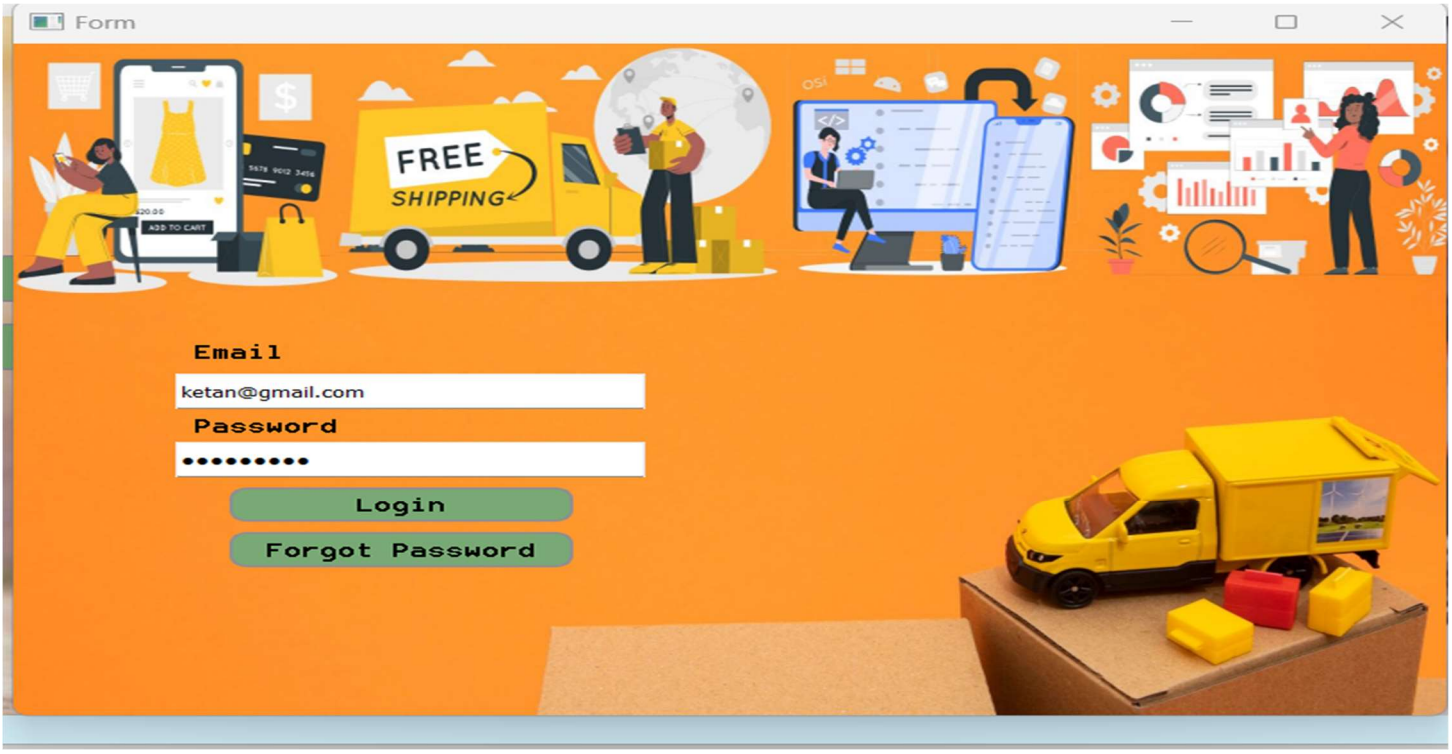


Fig4. Existing account login

- As we modelled and built a user registration system using email, we can login to the account by giving the login email address and password.
- This will take you to the page where user can check his order status and recommendation analysis.

Customer user login ID

Email – ketan@gmail.com

Password – kethan123

UPDATE customers_table

SET Password = "$argon2id$v=19$m=65536,t=3,p=4$s0e8ukAu8eEXoTnOyrAy8g$HoKr2sLPJfn38HACvb66nahxJXO8w1XEbvXD1btlirQ"

WHERE Email = 'ketan@gmail.com';

Hashed password saved in the database:

OrderID	Customer_name	Email	Password
171-0088192-2493940	ketan	ketan@gmail.com	$argon2id$v=19$m=65536,t=3,p=4$s0e8ukAu8eEXoTnOyrAy8g$HoKr2sLPJfn38
171-6431946-7036311	ketan	ketan@gmail.com	$argon2id$v=19$m=65536,t=3,p=4$s0e8ukAu8eEXoTnOyrAy8g$HoKr2sLPJfn38
403-5690062-3076353	ketan	ketan@gmail.com	$argon2id$v=19$m=65536,t=3,p=4$s0e8ukAu8eEXoTnOyrAy8g$HoKr2sLPJfn38
403-7225877-0437959	ketan	ketan@gmail.com	$argon2id$v=19$m=65536,t=3,p=4$s0e8ukAu8eEXoTnOyrAy8g$HoKr2sLPJfn38
404-6269611-5889952	ketan	ketan@gmail.com	$argon2id$v=19$m=65536,t=3,p=4$s0e8ukAu8eEXoTnOyrAy8g$HoKr2sLPJfn38
407-5617652-4425963	ketan	ketan@gmail.com	$argon2id$v=19$m=65536,t=3,p=4$s0e8ukAu8eEXoTnOyrAy8g$HoKr2sLPJfn38

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5. Successful logged in user page

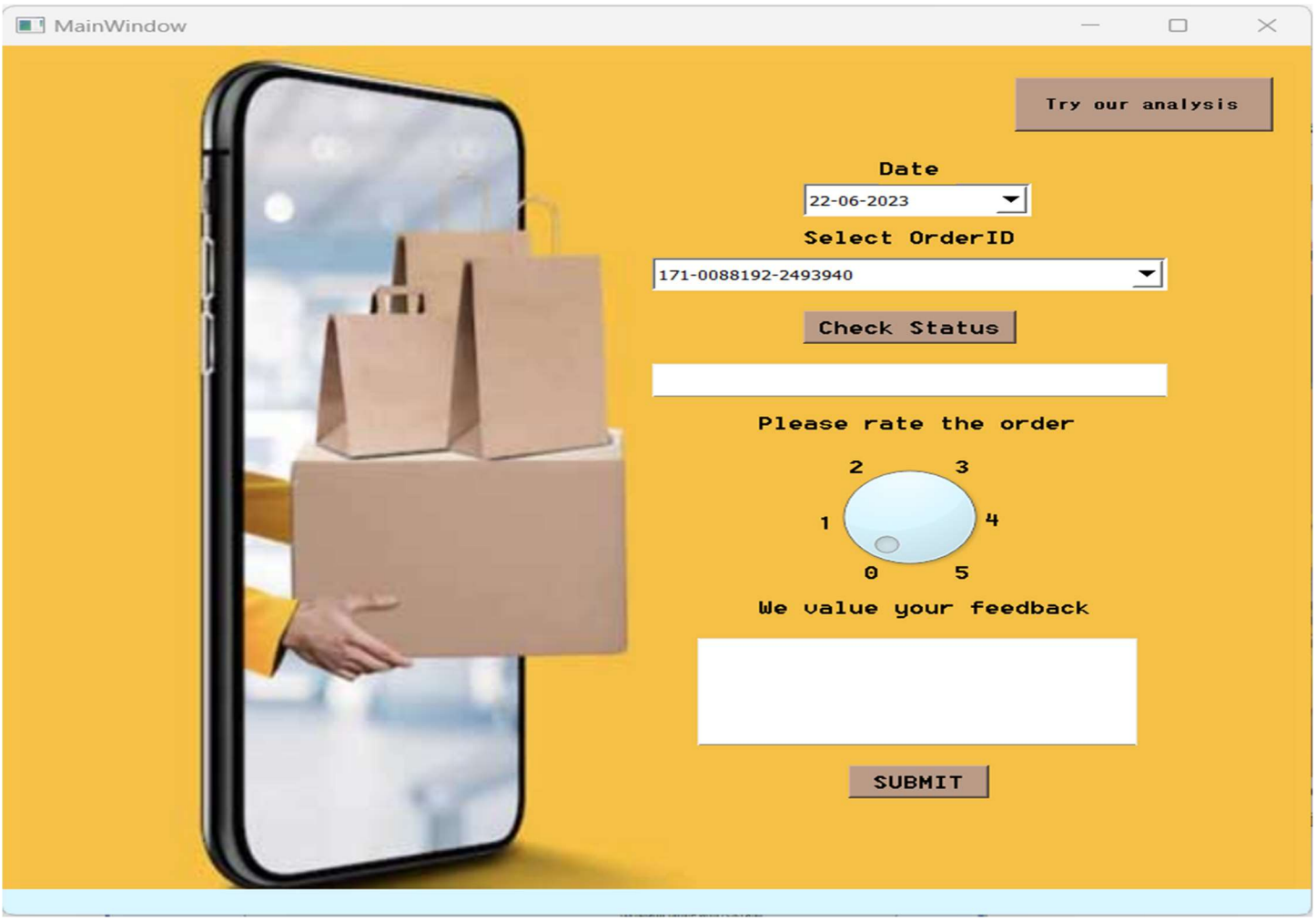

Fig5. User page

- Successfully logged in user account can take to this page where user can check their order status and give the rating and feedback accordingly to the service they provide.
- Here users can also try and check their analysis for recommendations of the products related to the products in their previous order using “Try your Analysis” button.

6. Checking the Status and providing feedback

- Successfully logged in user account can take to this page where user can check their order status and give

- After logging in to the account, select the date of the order in the Date dropdown for which user want to check the status. Here we have selected 16th July 2023.
- After selecting the date, the list of orders ordered on that date can be shown in the select order Id dropdown. Here we have selected the order Id that need to check the status.
- After clicking the check status button, we can see the status of the order that is shipped.
- Users can also give the rating from 0 to 5 to the service the shipping team and the company provided and can give feedback also.
- After entering the submit button the rating and feedback given by the customer can be saved into the database. It can later be used for analysis performed on the services provided by the shipping team.

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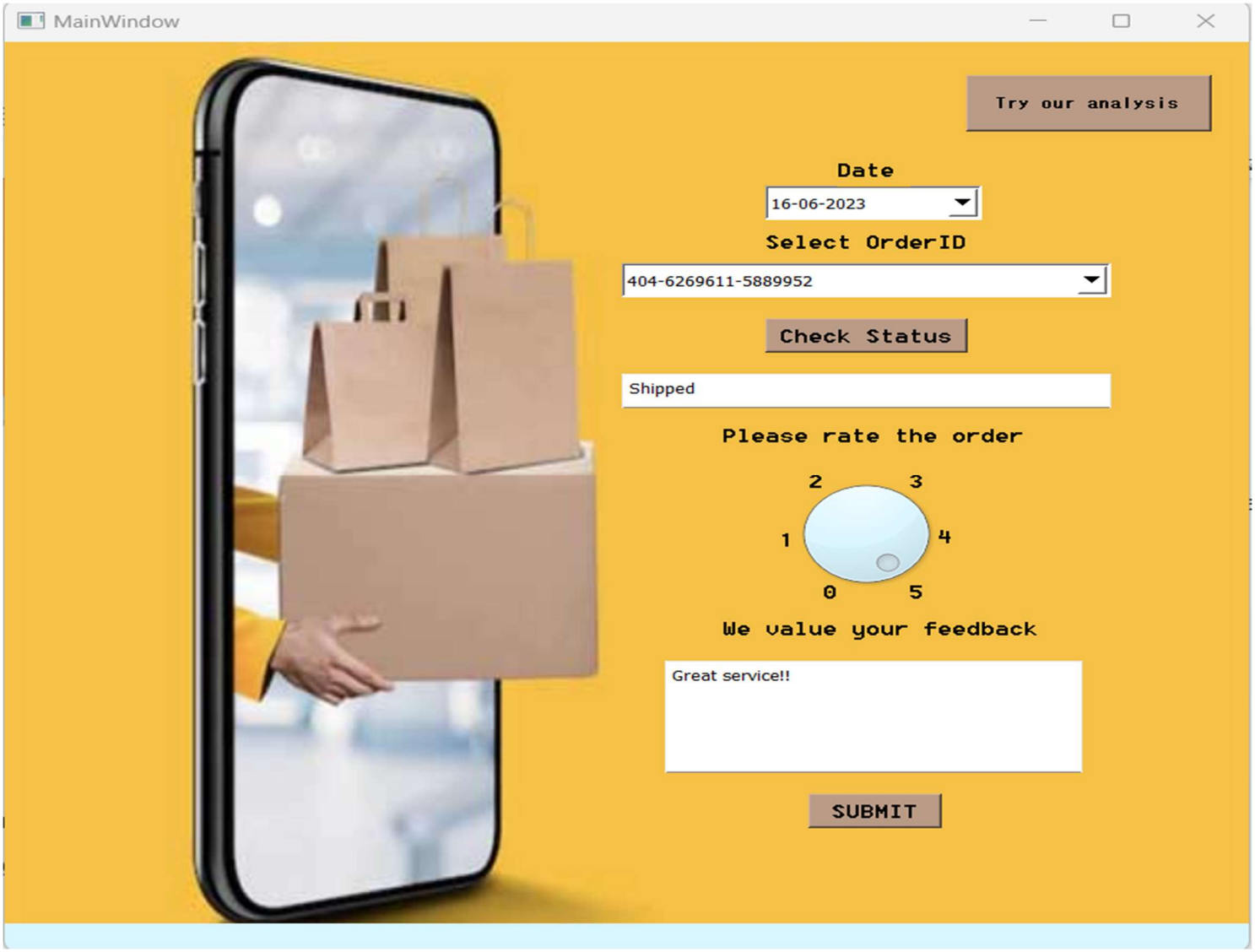

Fig6. Status checking and giving feedback.

Feedback stored in the Backend:

Result Grid | Filter Rows: | Export: | Wrap Cell Content:

sword	PhoneNumber	Rating	Feedback
on2id$v=19$m=65536,t=3,p=4$s0e8ukAu8eEXoTnOyrAy8g$HoKr2sLPJfn38HACvb66nahxJXO8w1XEbvXD1btlirQ	+91(946) 703-2672		
on2id$v=19$m=65536,t=3,p=4$s0e8ukAu8eEXoTnOyrAy8g$HoKr2sLPJfn38HACvb66nahxJXO8w1XEbvXD1btlirQ	+91(946) 703-2672		
on2id$v=19$m=65536,t=3,p=4$s0e8ukAu8eEXoTnOyrAy8g$HoKr2sLPJfn38HACvb66nahxJXO8w1XEbvXD1btlirQ	+91(810) 512-4389		
on2id$v=19$m=65536,t=3,p=4$s0e8ukAu8eEXoTnOyrAy8g$HoKr2sLPJfn38HACvb66nahxJXO8w1XEbvXD1btlirQ	+91(800) 711-5994		
on2id$v=19$m=65536,t=3,p=4$s0e8ukAu8eEXoTnOyrAy8g$HoKr2sLPJfn38HACvb66nahxJXO8w1XEbvXD1btlirQ	+91(442) 875-2991	5	Great service!!
on2id$v=19$m=65536,t=3,p=4$s0e8ukAu8eEXoTnOyrAy8g$HoKr2sLPJfn38HACvb66nahxJXO8w1XEbvXD1btlirQ	+91(892) 110-6005		

Result 9

Fig5b. Feedback and rating saved in database.

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7. Personalized recommendations

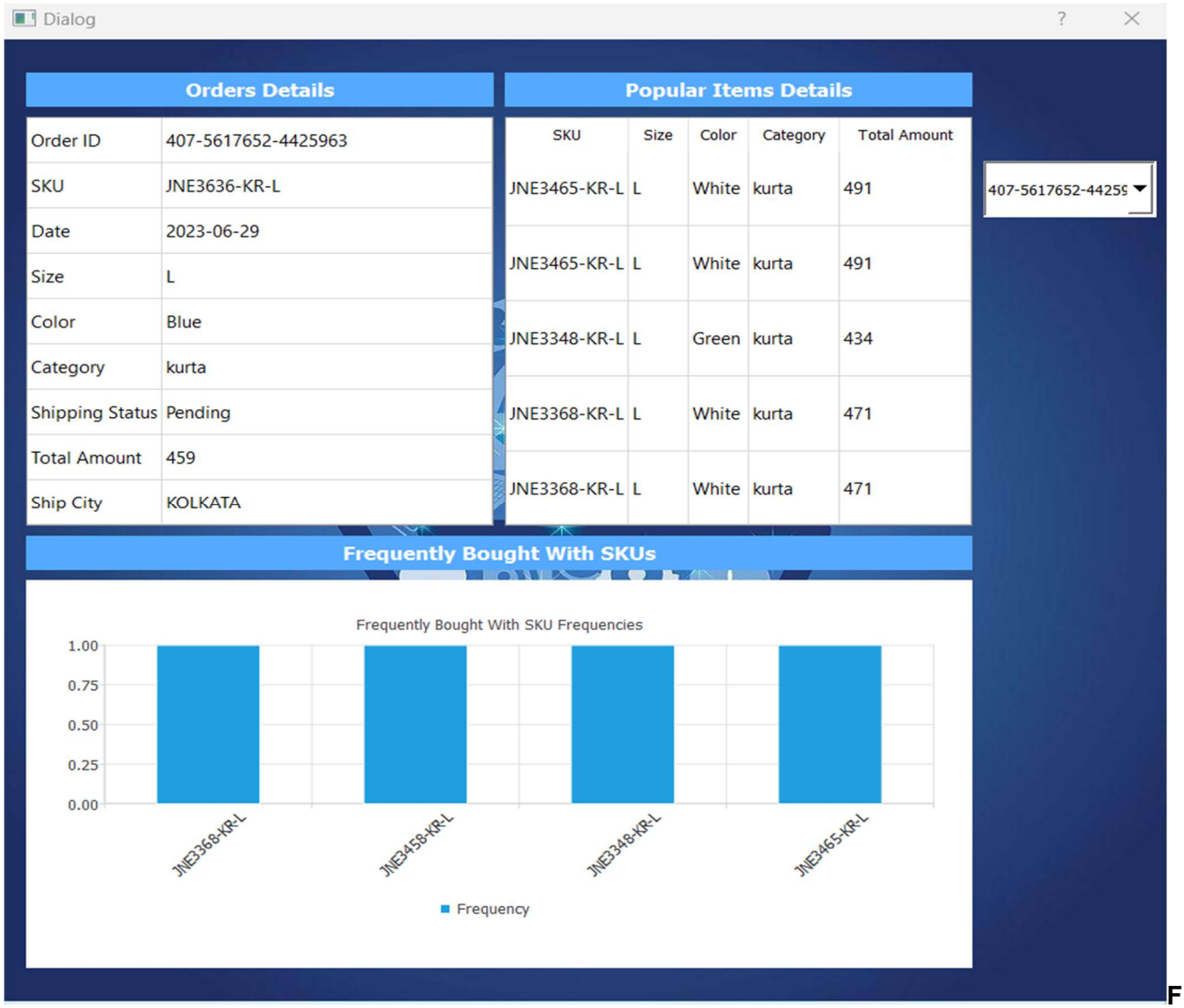

Fig7. Product recommendations page

- After selecting try your analysis button it can prompt to this page. In the dropdown menu, the list of the recent customer orders can be shown, and we can select one.

- After selecting the customer order Id, the page will give the details of the order, popular idem details and frequently bought with respect to product ids (SKU's).
- In the order details, it gives the details of the order like products in the order and their ID's (SKU's), date of the order, color and category of the product, shipping status and total amount cost and the shipping city.
- In the popular item details, it gives recommendations with respect to size of the product that the user already ordered. We can se the top 5 product recommendations here.
- In Frequently Bought with SKUs, we can see the graph analysis for frequently bought products that display in the top 5 recommendations.

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8. Staff Login Page

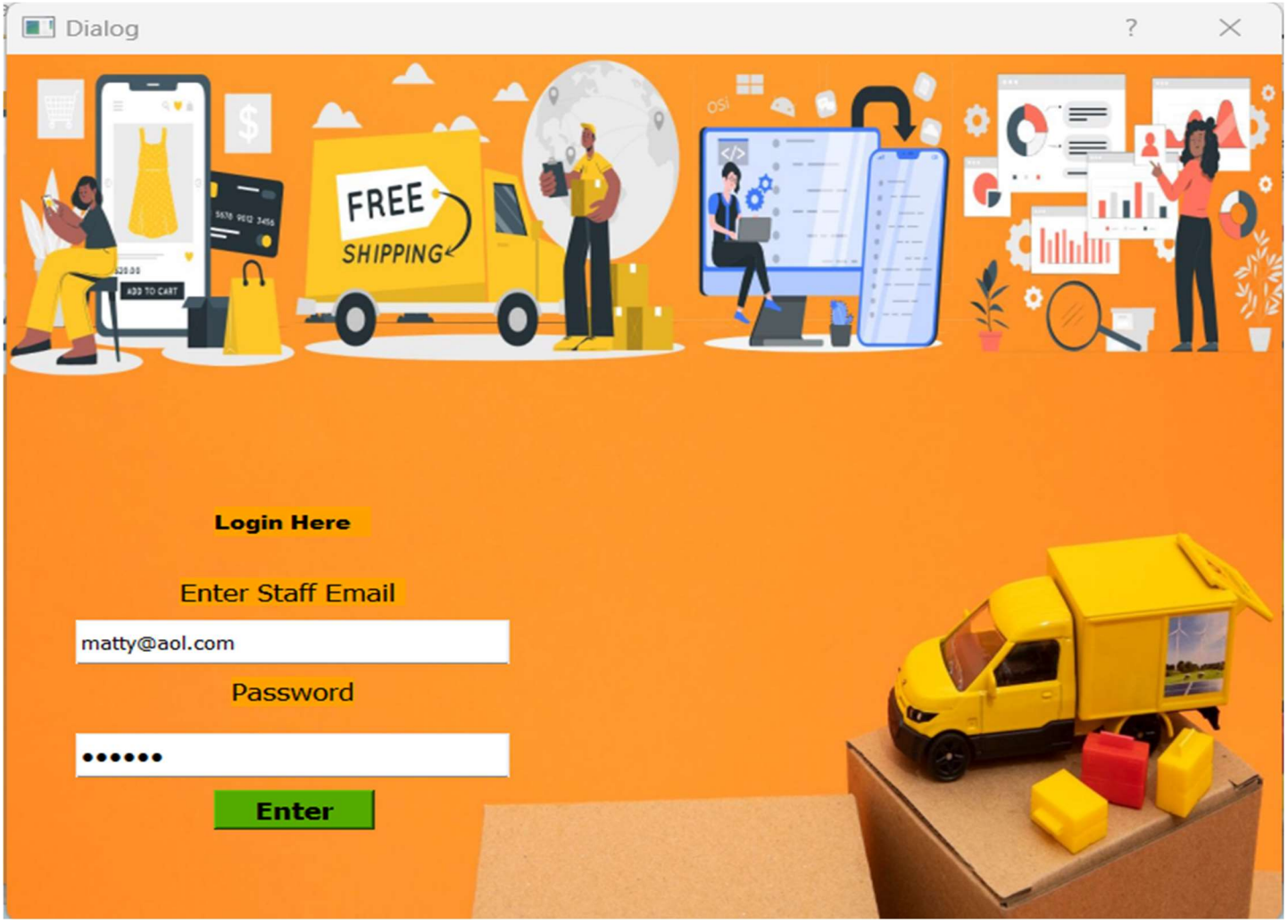

Fig8. Staff login page

- After getting into the staff portal and registering an account using email, this is the login page for the staff user.
- Here we have logged in to the staff page with login and giving the password, Passwords are securely hashed & stored using argon2 hasher in the database.

Staff User login ID

Emai ID – matty@aol.com

Password – 123456

Hashed staff password saved in database:

Result Grid | Filter Rows: | Edit: | Export/Import: | Wrap Cell Content:

StaffID	Staff_Email	Password
111008	matty@aol.com	$argon2id$v=19$m=65536,t=3,p=4$asd15oyJ...
NULL	NULL	NULL

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9. Status update page

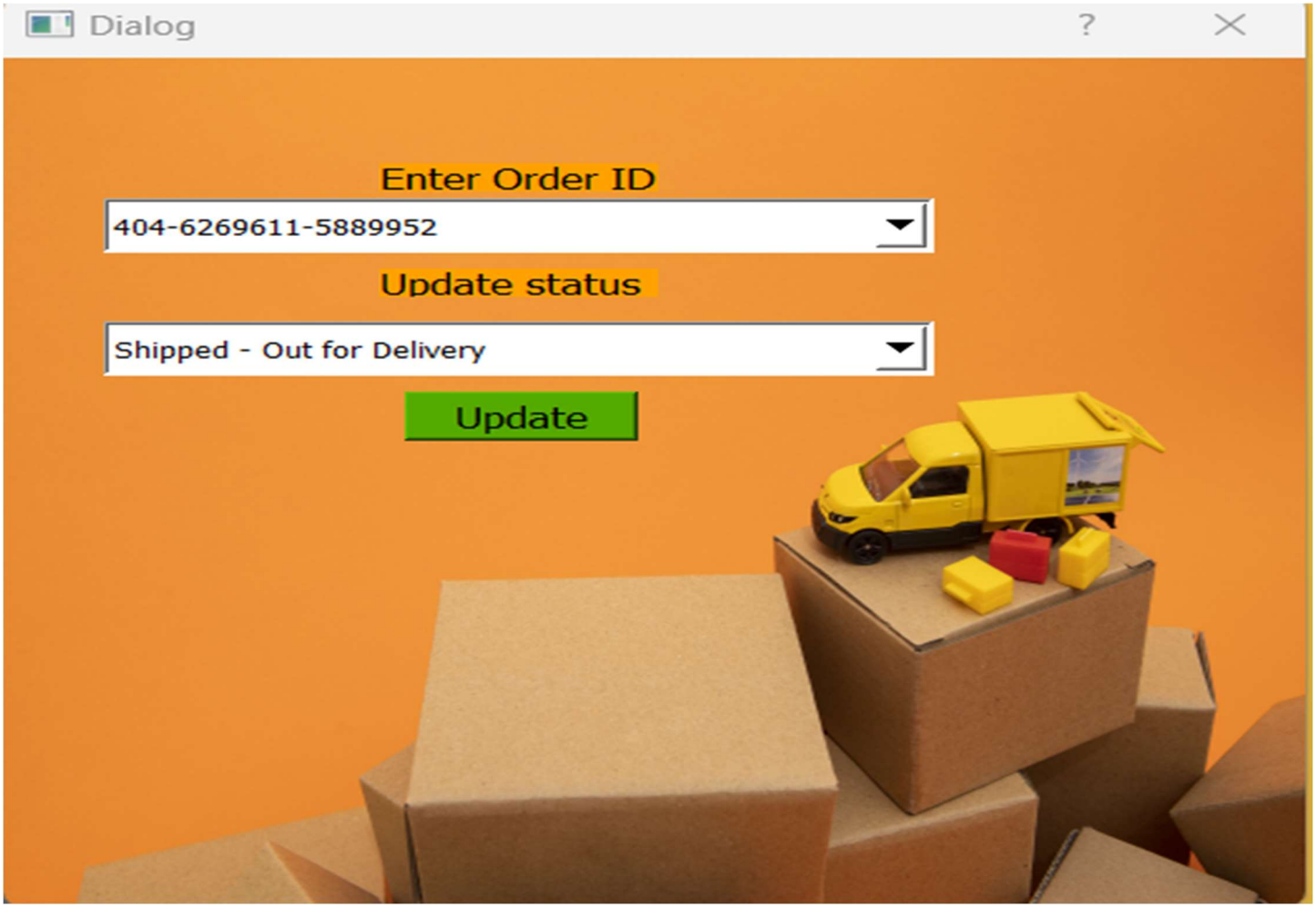

Fig9. Status update page

- After logging into the staff account, staff user can update the order delivery status.
- Once the staff update the order status, it can reflect in the customer login.
- A notification dialog pops up in the customer page after the user logged into account.
- This particular staff dealing with the orderId number 404-6269611-5889952 of ketan's order. Here we are updating the order status of this order of ketan.

10. Order status change Notification

- Once the user logged in to the account, the notification pops up after staff user updated the order status in the staff portal.
- In the notification, here displays the order Id and the updated status. After the staff updating the order status, ketan will get the notification regarding this.

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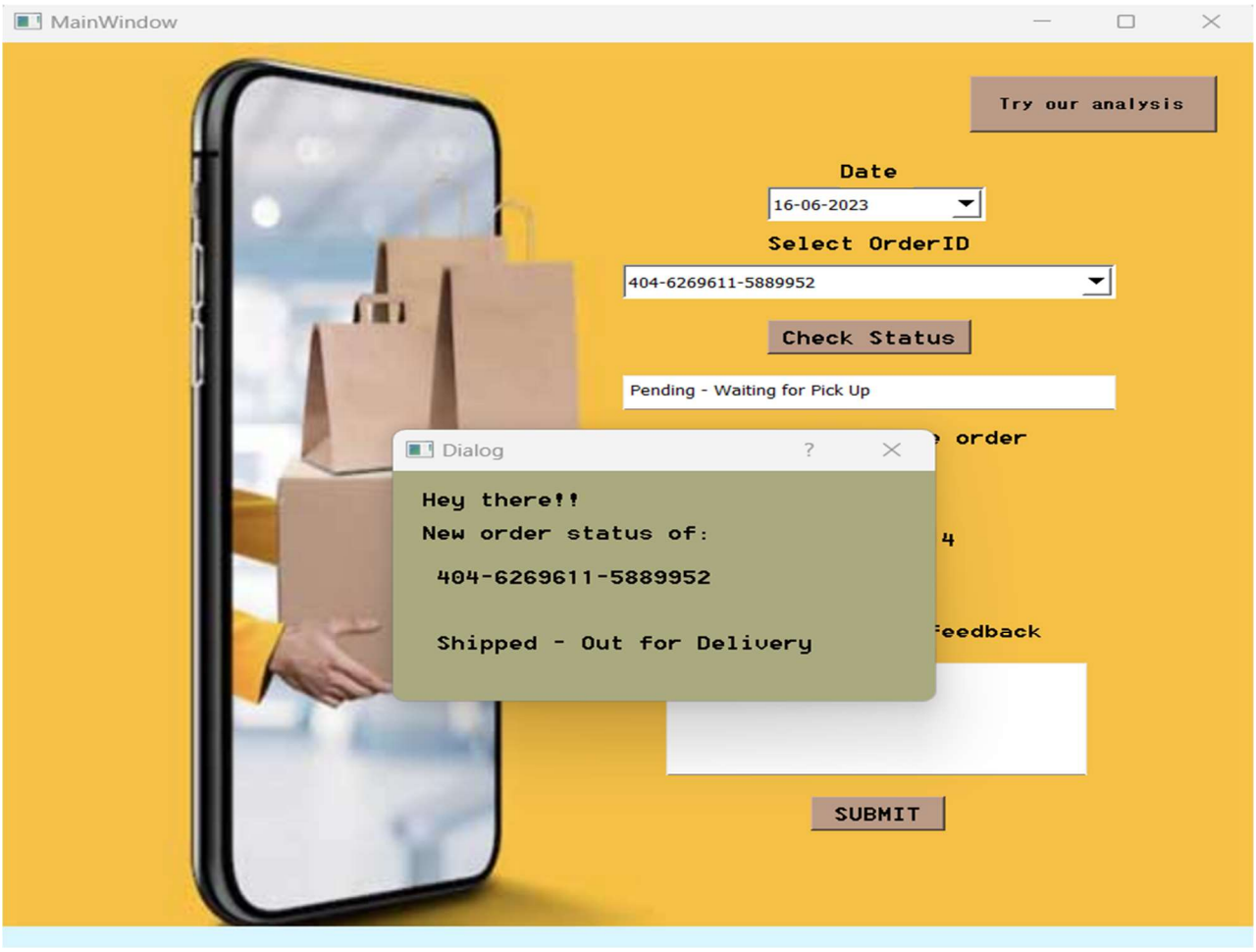

Fig10. Order status change Notification

The status of the order can update with these options:

Shipped, cancelled, pending, Pending- waiting for pickup, shipped-delivered to buyer, shipped- Returned to seller, Shipped- Picked up, Shipped- returning to seller, shipped- Out for delivery, Shipped- Rejected by buyer, shipped- Damaged, Shipping.

Summary For Operational Module

The operational module of this project encompasses a series of interconnected processes and interfaces designed to streamline the customer and staff experience, all while adhering to data governance rules for sensitive information such as passwords.

- **Customer and Staff Portals**: The system offers two distinct portals. The customer portal allows for self-service capabilities like order tracking and feedback submission, enhancing the post-purchase experience. The staff portal is designed for internal use, enabling employees to manage orders and access customer data necessary for service operations.

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- **Account Management:** Both new and existing users can manage their accounts through the system. New users are prompted to create an account with their full name, phone number, email, and a password, which are then governed by data protection rules to ensure privacy and security.
- **Order Tracking and Feedback**: Customers have the ability to track their orders in real-time by selecting the order ID and checking its status. They can also rate their order and provide feedback, contributing to quality control and service improvement.
- **Recommendations**: The system offers analytical tools that display details like order IDs, SKUs, and other relevant data. It also provides information on popular items and the frequency of purchases, which can be used for inventory management and marketing strategies.
- **Staff Interactions with Orders**: Staff members can log in to update order statuses as they change, such as when an order is shipped or out for delivery. This functionality is critical in keeping the customer informed and ensuring that the delivery process is transparent.
- **Data Governance:** Across all these functions, the system implements data governance rules, particularly concerning the handling of passwords and personal information. This ensures compliance with privacy regulations and establishes trust with users by safeguarding their data.

In summary, the app effectively bridges the gap for companies lacking their own shipping services. It offers a robust platform for both customers and staff to interact with the order and delivery process seamlessly. The application's strength lies in its detailed tracking system. This is user friendly for both customer and staff portals and an advanced recommendation engine that enhances the customer shopping experience. By providing real-time updates and comprehensive order details, the app not only improves operational efficiency but also enhances customers satisfaction and trust.

Working of Analytical Module

The analytical part of the application is designed to provide a comprehensive overview of sales and shipping metrics, crucial for driving business growth and strategic decisions. It includes analytical dashboards that offer insights into customer purchasing behaviors, product performance, and logistical efficiency. Key features include trend analysis, order status monitoring, product performance review, geographic sales insights, and customer preferences analysis. These tools empower businesses with data-driven insights to fine-tune operations, customize marketing efforts, forecast demand, and enhance customer service, ultimately leading to improved decision-making and business strategies.

Analytical Database:

Star Schema Overview:

The star schema is a type of database schema that is widely used in data warehousing and business intelligence applications. It is designed to optimize query performance and simplify the reporting and analysis of business data. The schema is named for its resemblance to a star, with a central fact table surrounded by dimension tables.

Based on the provided schema and standard star schema design practices, here's a brief overview of the tables and their relationships:

Tables Overview:

1. sales_fact_table:

- Central to the schema and contains transactional data from sales.
- Records sales amounts, inventory levels, and whether the sale was to a business-to-business client.
- Each record is uniquely identified by an `Order_ID`.

2. product_dimension:

- Descriptive information about each product sold.
- Includes style, color, category, and size.
- Identified by `SKU`, which is a unique identifier for stock keeping units.

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3. date_dimension:

- Time-related data that allows for analysis of sales over time.
- Includes attributes like day, month, year, and quarter.
- Each date is unique, allowing for daily granularity in reporting and analysis.

4. location_dimension_table:

- Geographical data related to where products are shipped.
- Includes postal code, country, state, and city.
- `ship_postal_code` serves as the unique identifier for each location.

5. shipping_fact_table:

- Contains data on the shipping of orders, including quantities shipped.
- Potentially linked to the `sales_fact_table` via `Order_ID`, implying a one-to-one or one-to-many relationship.

6. fulfilment_dimension_table:

- Information on how each order was fulfilled.
- Attributes include the service level of shipment, the entity responsible for fulfilment, the sales channel used, and the status of the courier.

- `Order_ID` is used to link back to the `sales_fact_table`, which can be a one-to-one or one-to-many relationship depending on whether each order ID corresponds to a single record or multiple records in this table.

Relationships:

- The **sales_fact_table** is the central hub of the star schema, with foreign keys linking to all the dimension tables.

- **product_dimension** and **date_dimension** are standard dimension tables, providing context to the quantitative data in the fact table. Each sale has one SKU and one Date.

- **shipping_fact_table** is another fact tables due to the presence of quantitative fields like `Quantity` and `Order_ID`. These are less common in star schemas but can occur when different processes are captured in separate fact tables.

- **location_dimension_table** is linked to **shipping_fact_table**, providing spatial context to the shipping process.

Data Flow:

- A sale is recorded in the **sales_fact_table** with a unique `Order_ID`, referencing a `SKU` from **product_dimension** and a `Date` from **date_dimension**.

- The **shipping_fact_table** captures how each `Order_ID` is shipped, including the `Quantity` and the destination `ship_postal_code`, which is detailed in the **location_dimension_table**.

- The **fulfilment_dimension_table** provides insight into the fulfilment process of each order, potentially offering a more detailed view of the shipping and handling process that could be linked to both **sales_fact_table** and **shipping_fact_table** through the `Order_ID`.

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This schema allows for a comprehensive analysis of sales data, including what products are being sold, when sales occur, where products are shipped to, and how the fulfilment process is managed. It's well-suited for answering business intelligence questions such as sales performance, product popularity, shipping efficiency, and fulfilment effectiveness.

Specifications and Usability of Analytical Module:

The analytical dashboard created using PyQt5, as shown in the screenshots, provides a graphical interface for analyzing e-commerce sales data. The dashboard offers various interactive visualizations to aid in the understanding and analysis of sales trends and patterns. Here's a brief overview of the views and their features:

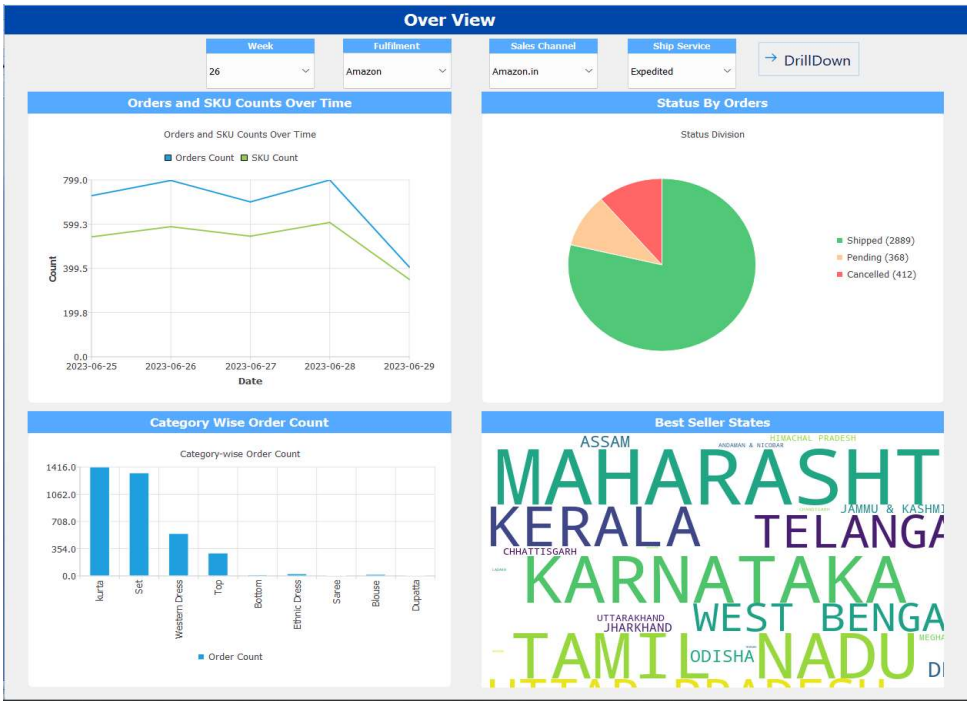
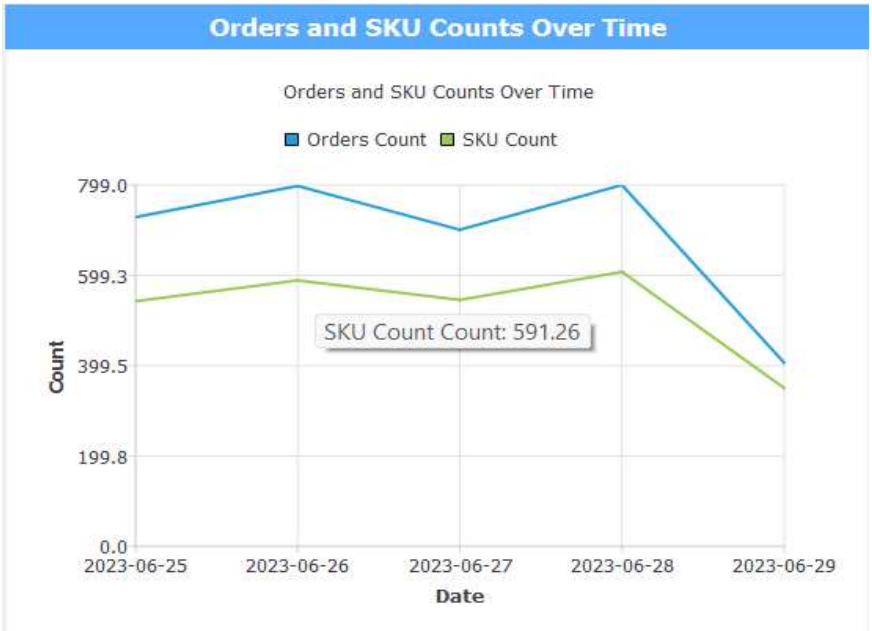


Fig1.Overview Tab

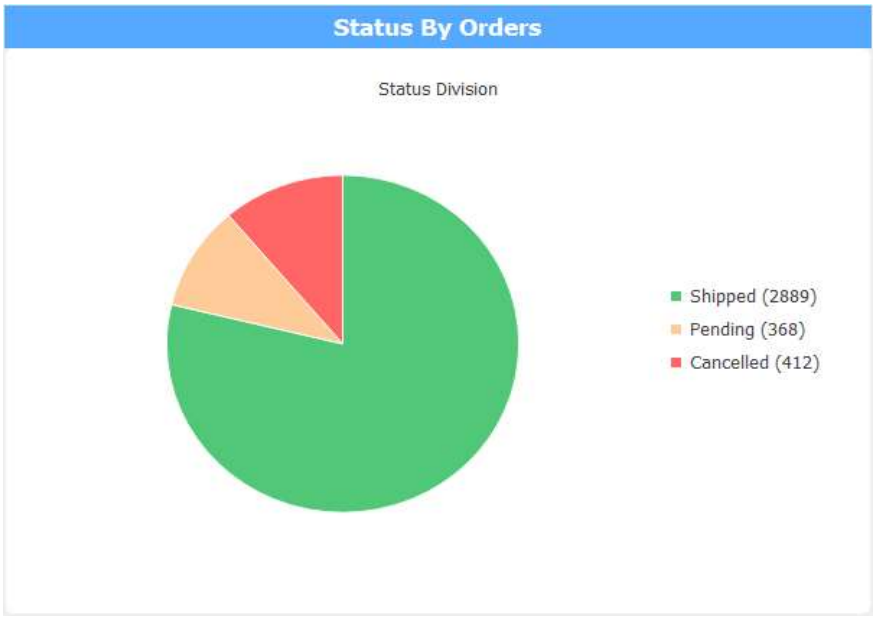
SALES-SHIPMENT ANALYSIS

1. **Line Charts (Orders and SKU Counts Over Time):**



- This visualization shows the trend of order counts and SKU counts over time.
- Users can **hover over** the points to see the specific counts at different times, enhancing interactivity and providing immediate data insights.
- **Analysis**: Helps in understanding sales performance and inventory movement over selected periods.

2.Pie Chart (Status by Orders):



- It displays the proportion of orders by their status, such as Shipped, Pending, or Cancelled.
- Hovering over the segments shows the exact count of orders in each status.
- **Analysis**: Useful for assessing the order fulfilment process and identifying any bottlenecks or issues.

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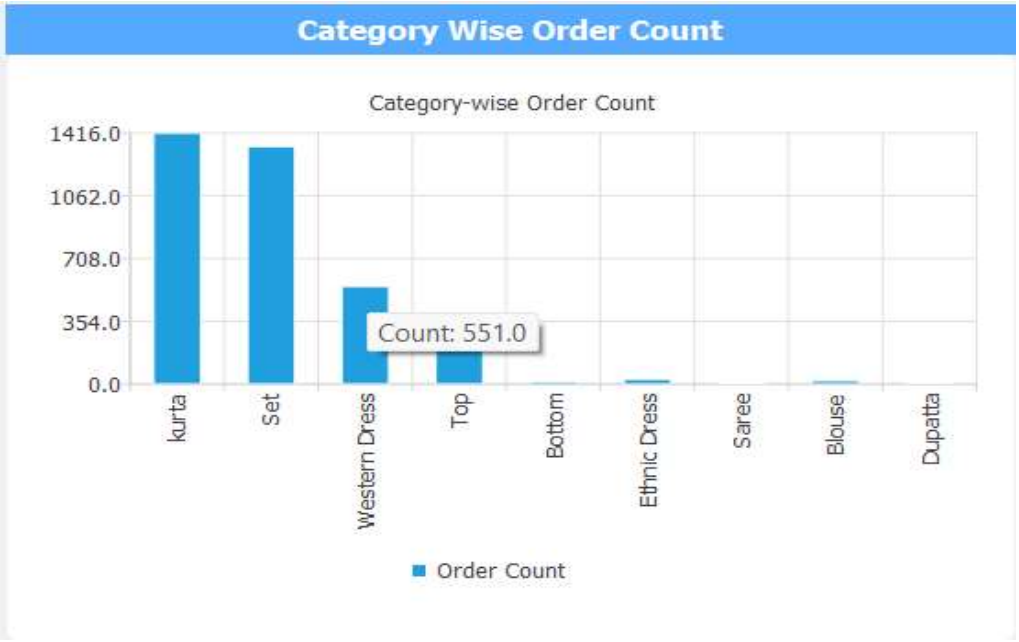
3.Bar Chart (Category Wise Order Count):



- It represents the number of orders per product category.
- Hovering over the bars shows the count of orders for each category.
- **Analysis**: Highlights which categories are most popular or may require additional marketing focus.

4. **Word Cloud (Best Seller States):**

- The word cloud visualization emphasizes the states with the highest order counts by displaying them in larger fonts.
- **Analysis**: Provides a quick visual representation of geographic sales distribution, indicating where marketing and sales efforts are most effective or where there might be potential for growth.

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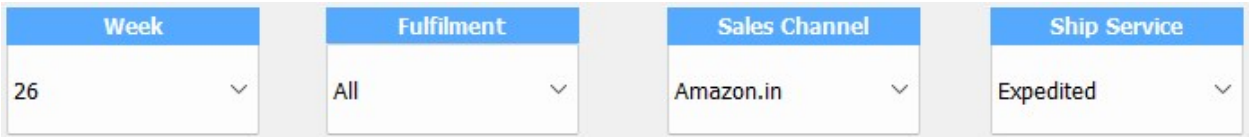
Drilldown Tab:

This tab allows users to drill down into more specific data, possibly allowing them to view sales by individual products, customers, or other detailed metrics by navigating to the Drilldown view.

Features:

5. **ComboBox Filters**: These dropdowns allow the user to filter the data by week, fulfilment method, sales channel, and ship service level, dynamically updating the visualizations to reflect the selected criteria.



6. **Interactive Hover Options:** Custom tooltips display additional information when the user hovers over different parts of the visualizations, such as data points on the line and bar charts, segments on the pie chart, and words in the word cloud.
7. **CommandLinkButton:** A button for navigating to the DrillDown dialog, providing a more detailed analysis.

Overall Analysis Capability:

The dashboard provides a comprehensive view of e-commerce sales operations. It enables stakeholders to monitor performance, identify trends, and make informed decisions based on up-to-date data.

From operational efficiency (e.g., order status and fulfilment) to sales performance (e.g., category popularity and regional demand), the dashboard serves as a decision support tool for various business functions such as inventory management, marketing strategy, and sales forecasting.

By integrating data from different tables into interactive visualizations, the dashboard transforms raw data into actionable insights, thus supporting strategic business analysis and reporting.

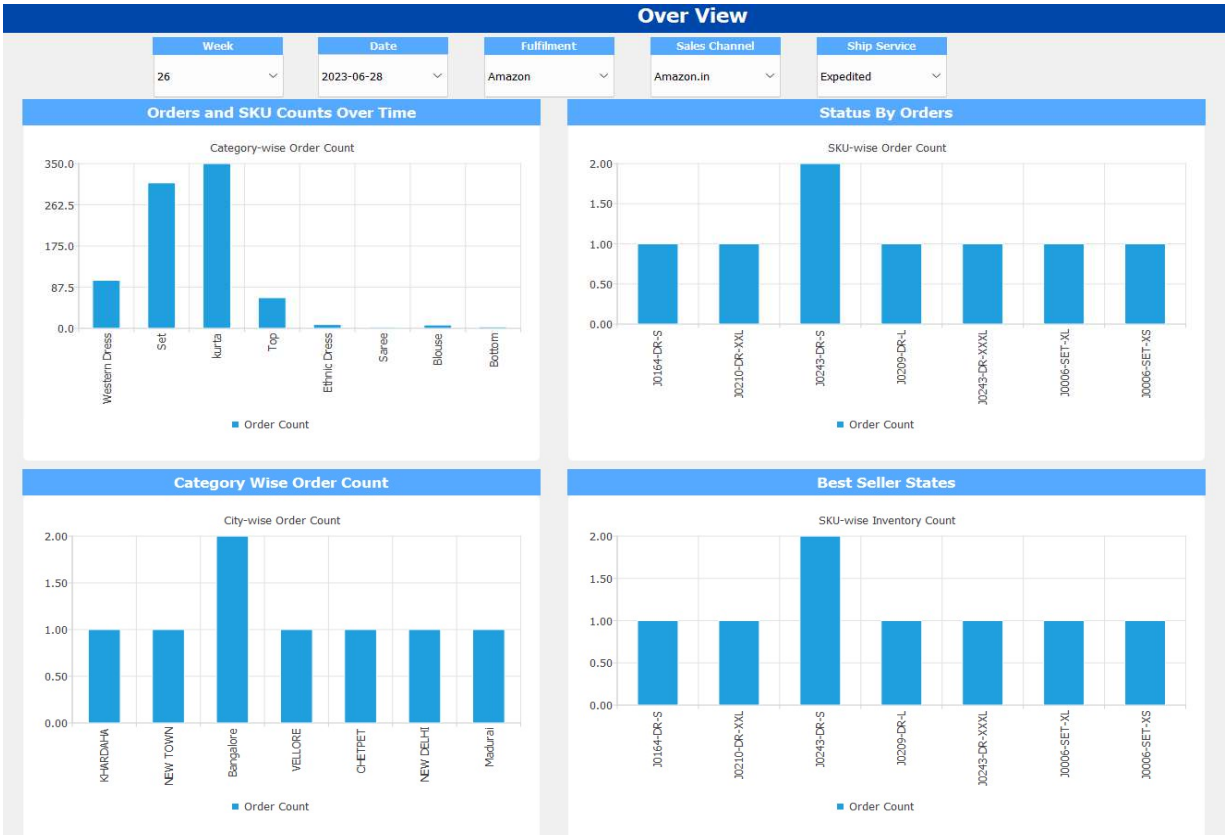


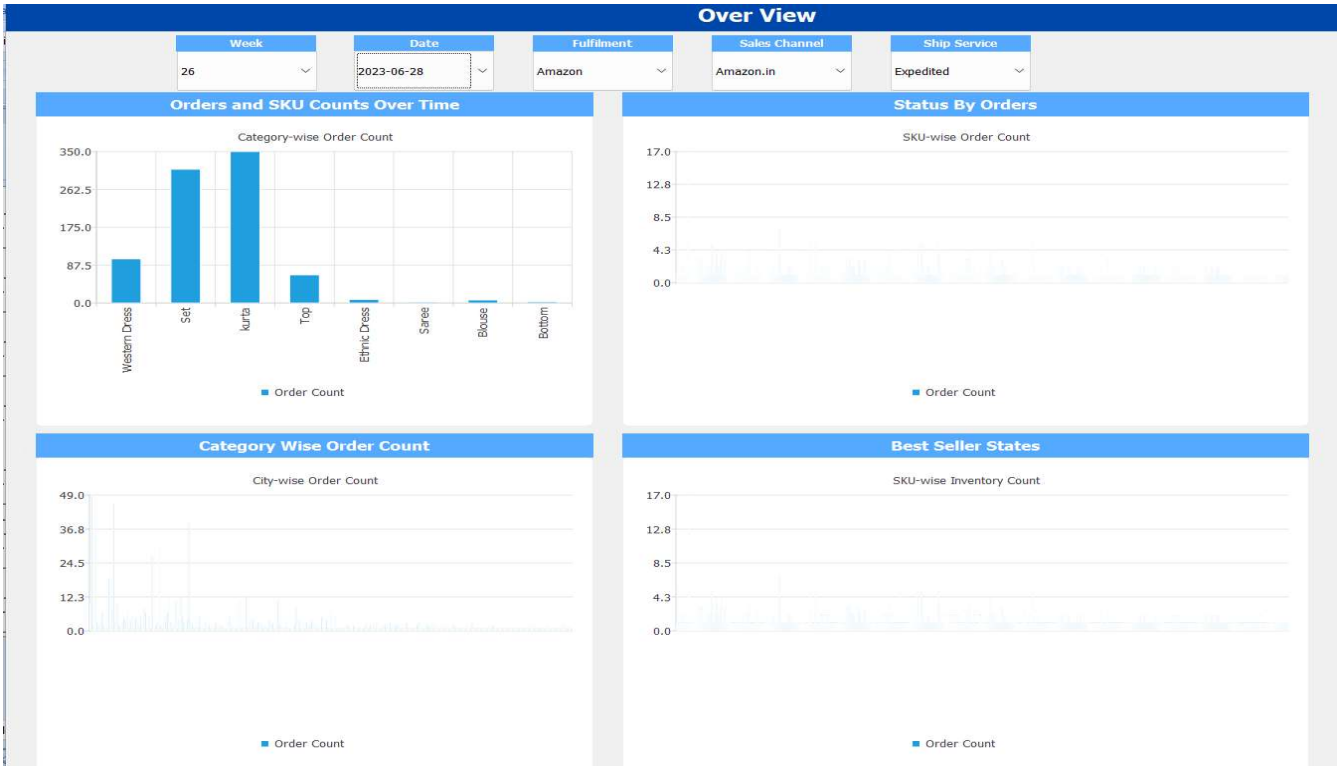
Fig2.Drilldown View

The provided PyQt5 code and the accompanying screenshot depict a detailed analytical view, referred to as "Drill View", within an e-commerce sales report application. This drill-down functionality allows users to perform a more granular analysis of sales data across various dimensions. Here's a breakdown of the view, its features, and the potential analyses that could be drawn:

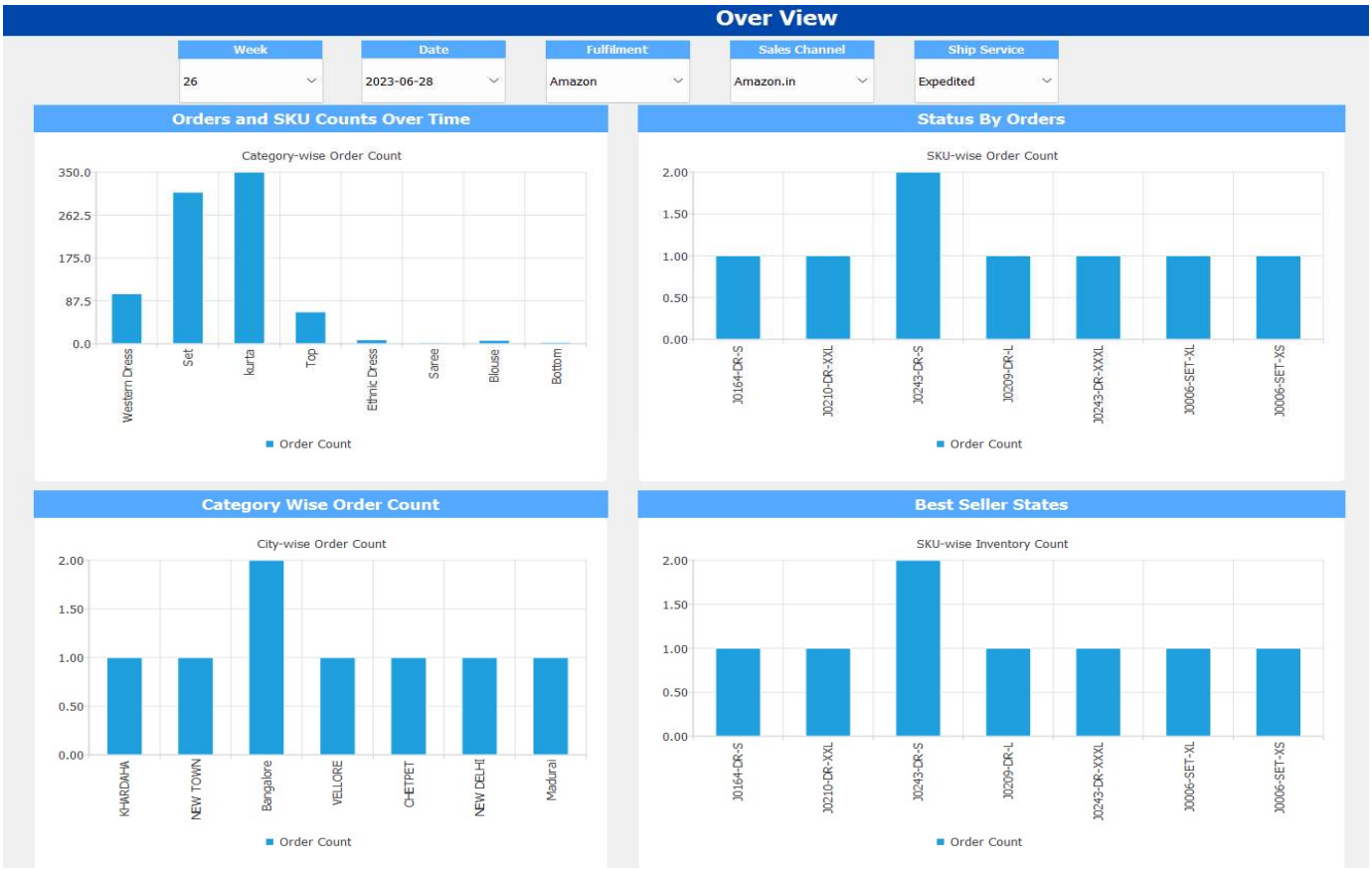
Features:

8. **Filterable ComboBoxes:** Users can filter the data by week, date, fulfilment, sales channel, and shipping service level. These filters dynamically update the visualizations to reflect the selected criteria.

9. **Bar Charts:** There are several bar charts displayed, including category-wise, SKU-wise, city-wise, and inventory counts.



Selecting the **Ethnic Dress** category we'll get:



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10. **Interactivity:** Hovering over the bars on any chart displays a tooltip with the count, which can provide immediate insights into the data. **Clicking events** on the bar charts can trigger other charts to update, showing related data.
11. **SKU and City Drilldowns:** Clicking on a category in the bar chart updates the SKU-wise and city-wise order count charts to reflect the selection, allowing for a drill-down analysis by category.

Analysis from Each View:

12. **Category-wise Order Count:** This chart shows the distribution of orders across different product categories. Analyzing this chart can help identify which categories are performing well and which may require additional marketing efforts or inventory adjustments.
13. **SKU-wise Order Count:** By showing orders per SKU, this chart helps to identify the best-selling individual products. It can be used for inventory planning, identifying stock-outs, or planning promotions for underperforming SKUs.
14. **City-wise Order Count:** This visualization helps to identify which cities are generating the most orders. It's useful for localized marketing campaigns, distribution planning, and understanding regional demand.

15. **SKU-wise Inventory Count:** This chart provides insights into the inventory levels for different SKUs. It's crucial for managing stock levels, preventing overstocking or stockouts, and understanding inventory turnover.

Overall Analysis Capability:

The "Drill View" in the dashboard is a powerful tool for detailed sales analysis. It allows users to:

- Understand the sales distribution across different dimensions such as time, category, SKU, and geography.
- Make informed decisions on inventory management, marketing strategies, and sales targeting.
- Identify trends and patterns at a granular level, enabling proactive business decisions.

In summary, “Drill View" offers a comprehensive analysis platform within the e-commerce sales report application. It provides actionable insights that can help drive business strategy and improve operational efficiency. The interactivity and dynamic filtering capabilities enhance the user experience, making data analysis both efficient and effective.

SALES-SHIPMENT ANALYSIS

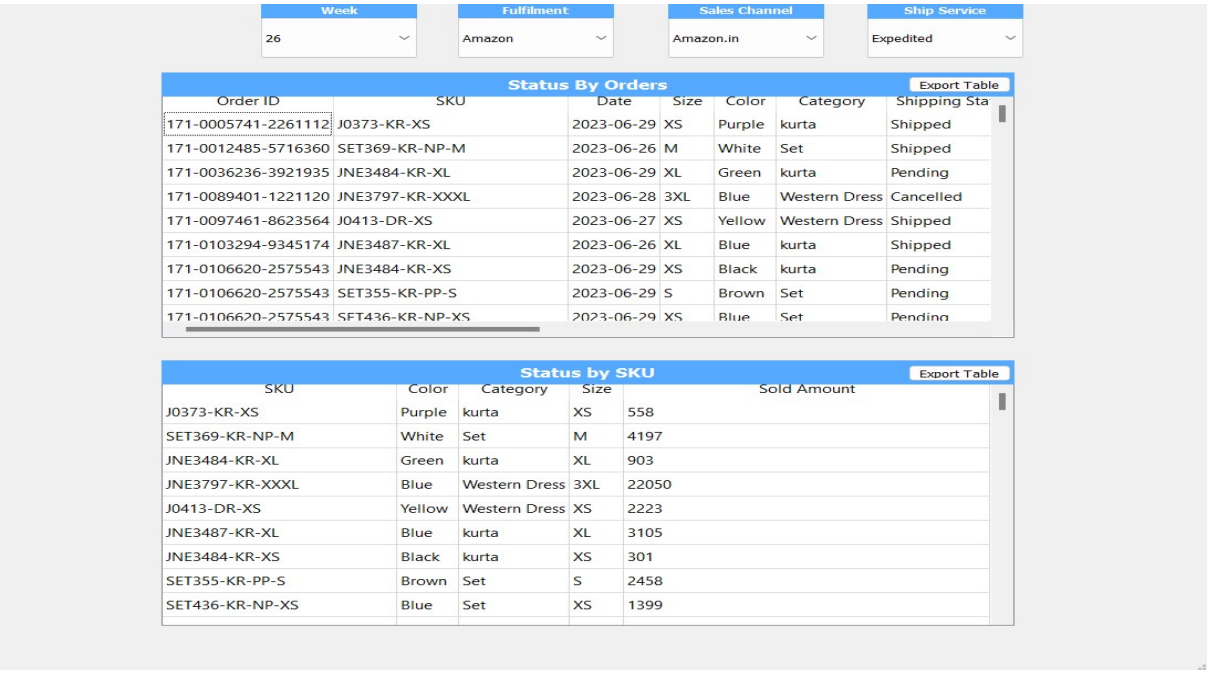

Fig3.Report View:

Features:

- **Dynamic Filters:** The view includes combo boxes that allow users to filter the displayed data by 'Week', 'Fulfillment', 'Sales Channel', and 'Ship Service'. These filters dynamically update the tables based on the selection.

- **Detailed Data Tables:** Two tables display detailed sales data, including information such as 'Order ID', 'SKU', 'Date', 'Size', 'Color', 'Category', 'Status', 'Inventory', 'Sales Channel', 'Ship City', and 'Ship State'.
- **Export Functionality:** There are buttons to export the data from each table into a CSV file, providing users with the flexibility to perform further analysis outside the application.

- **Interactive QTableView:** The tables are interactive, allowing users to sort and thus possibly edit the data.

Analysis from Each View:

- **Status by Orders:** The first table seems to show the status of orders, providing a quick overview of order fulfillment, which can be useful for tracking delivery efficiency and customer satisfaction.

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Status By Orders — Export Table

Order ID	SKU	Date	Size	Color	Category	Shipping Sta
171-0097461-8623564	J0413-DR-XS	2023-06-27	XS	Yellow	Western Dress	Shipped
171-0103294-9345174	JNE3487-KR-XL	2023-06-26	XL	Blue	kurta	Shipped
171-0106620-2575543	JNE3484-KR-XS	2023-06-29	XS	Black	kurta	Pending
171-0106620-2575543	SET355-KR-PP-S	2023-06-29	S	Brown	Set	Pending
171-0106620-2575543	SET436-KR-NP-XS	2023-06-29	XS	Blue	Set	Pending
171-0167969-1989977	SET331-KR-NP-XL	2023-06-28	XL	Green	Set	Shipped
171-0185726-0530766	SET334-KR-NP-L	2023-06-27	L	Brown	Set	Shipped
171-0225809-7729908	SET203-KR-DPT-L	2023-06-27	L	Red	Set	Shipped
171-0229372-1357169	JNE3878-KR-I	2023-06-25	I	Green	kurta	Shipped

- **Status by SKU:** The second table appears to show sales data broken down by SKU, including the sold amount, which is crucial for inventory management and identifying sales trends for specific products.

Status by SKU Export Table

SKU	Color	Category	Size	Sold Amount
J0373-KR-XS	Purple	kurta	XS	558
SET369-KR-NP-M	White	Set	M	4197
JNE3484-KR-XL	Green	kurta	XL	903
JNE3797-KR-XXXL	Blue	Western Dress	3XL	22050
J0413-DR-XS	Yellow	Western Dress	XS	2223
JNE3487-KR-XL	Blue	kurta	XL	3105
JNE3484-KR-XS	Black	kurta	XS	301
SET355-KR-PP-S	Brown	Set	S	2458
SET436-KR-NP-XS	Blue	Set	XS	1399

Overall Analysis Capability:

- **Operational Reporting**: This reporting view is tailored for operational reporting, allowing users to see fine-grained details of sales transactions. It can be used for day-to-day management and immediate action based on sales performance.
- **Data Exporting:** By exporting data, users can perform custom analyses, like trend analysis, forecasting, or even integrate with other data sources for a comprehensive overview.

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- **Custom Filtering:** The ability to filter by different dimensions enables users to narrow down to specific aspects of sales data, such as understanding sales in a particular week or analyzing the performance of a sales channel.
- **Actionable Insights:** The detailed breakdown can help identify issues like stock shortages, popular products, or bottlenecks in shipping and fulfillment, leading to actionable business insights.

In summary, the `TitanicWindowReport` dialog in the dashboard serves as an operational tool that provides detailed insights into e-commerce sales data. The ability to filter, interact with, and export the data makes it a versatile component for users who need to drill down into specific areas of business performance.

Future Scope:
The "Sales-Shipment Analysis" project provides a comprehensive platform for tracking and analyzing sales and shipping data, which is instrumental in enhancing operational efficiency and customer satisfaction. While the current system is robust, there's always room for innovation and growth. Here are some potential areas for future scope and improvement:

1. Real-Time Data: Improve data streams for instant sales and shipping updates.

2. Predictive Analytics: Use machine learning for forecasting and trend prediction.

3. CRM Integration: Embed customer tracking and personalized marketing.

4. Mobile Access: Develop apps for remote access and notifications.

5. Security Upgrades: Strengthen data protection with advanced security features.

6. UX Improvements: Refine interfaces based on user research for better engagement.

7. Enhanced Visual Tools: Integrate interactive, sophisticated dashboard visuals.

8. Cloud Migration: Move to cloud services for scalability and cost efficiency.

9. Feedback Utilization: Automate the incorporation of customer insights into service enhancements.

10. Extensibility: Create a customizable plugin system for tailored functionalities.

These steps will ensure the platform remains cutting-edge in the dynamic e-commerce sphere.

Technical Aspects

The launching of the app can be done from python terminal by selecting the python file of the project saved and executed of the following terminal.

1. **For operational** – python main.py
2. **For analytical** – Run the file “GUIApp.ipynb” in Jupiter notebook

Files: -

1. **Common Files**
   DATA225utils – Utility file that have common function that required all over the project.

2. **Operational**
   Main.py – This is the main file that is used to execute that has all the remaining files related to login and all the operation executions of all the project. We need to run this file for launching the app.
   techorcas_db.ini – Connection to database on the school server
   techorcas_wh.ini – connection to warehouse on the school server

3. **Analytical**
   GUIApp.ipynb – This is the main file used to execute that holds all the executions of the project related to analytical app.
   AppWindow.py - For launching the landing page
   techorcas_db.ini – Connection to database on the school server
   techorcas_wh.ini – connection to warehouse on the school server
4. **ETL**
   Fact_n_Dimensional_Tables.ipynb – For creating dimensional and fact tables for analytical purpose in the database from operational tables.

Report Summary:

The "Sales-Shipment Analysis" report by Team Tech Orcas details an innovative application aimed at enhancing sales and shipping processes in e-commerce. It is designed to improve customer experience post-purchase and empower staff with efficient order management tools.

Key Highlights:

- The operational module offers real-time order tracking, feedback systems, and personalized recommendations, bolstering customer satisfaction and loyalty.
- The analytical module provides a strategic view of sales and shipment data through dynamic visualizations, supporting informed decision-making.
- A well-architected database ensures data integrity and supports a robust ETL process with Python and SQL.
- Technical tools like Python, MySQL, and PyQt5, along with interactive features, create a seamless user experience.
- Detailed reporting and drill-down capabilities allow users to scrutinize sales data minutely.

In essence, this application represents a harmonious blend of operational functionality and analytical intelligence, catering to both immediate customer needs and long-term business strategies. It sets a benchmark for future advancements in e-commerce analytics and customer engagement.