WINE E-COMMERCE APPLICATION

TEAM – BOSSBUNCH

IMPORTANT LINKS

Links to the Screen Recordings of the Demos (Operational Application),

1. Login & SignUp - https://drive.google.com/file/d/1AUq4PH0SrC0biTLrYJm-d5YGrc2Gk1K4/view?usp=share_link

2. Main Application - https://drive.google.com/file/d/1J-Et2TWn8UisXzJVcFLBHfHvJ0dlqFkc/view?usp=share_link

3. Cart & Checkout - https://drive.google.com/file/d/1v6GjMUVgRzny3QtUMS1XfT-A5tZ_e6gA/view?usp=share_link

Links to the Screen Recordings of the Demos (Analytical Application),

1. Analytical App- https://drive.google.com/file/d/1FkS5aZmHDSWNgG2MThfatZbJDA96Y_xI/view?usp=share_link

INTRODUCTION

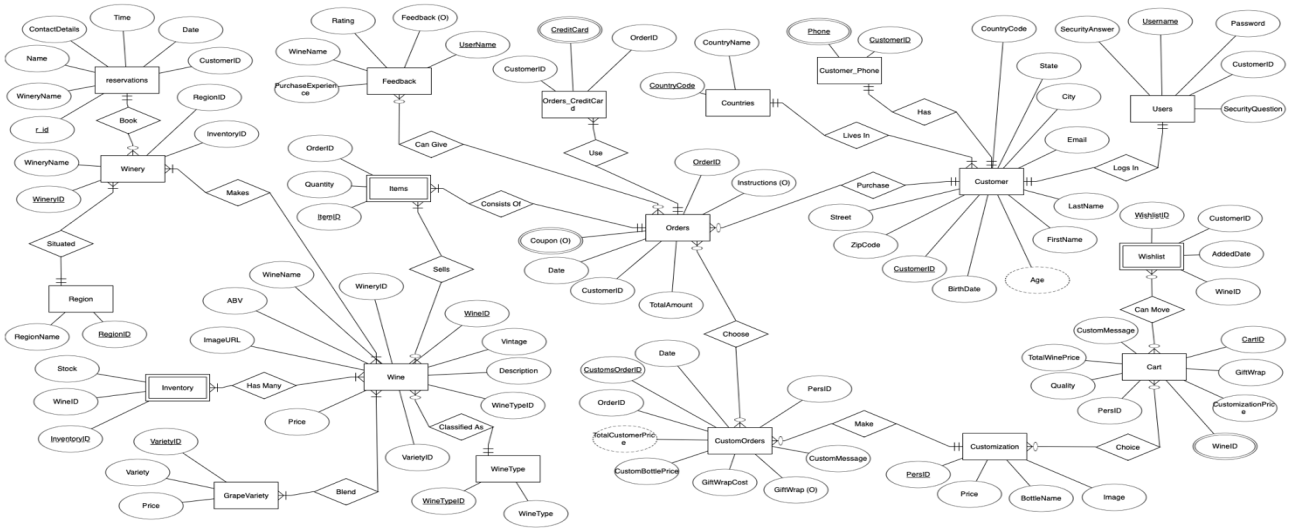
Our comprehensive wine e-commerce solution offers an intuitive GUI for users to browse, make reservations, customize purchases, and manage their wine collection. With an operational database and an analytical database, our application provides insights into user behavior, marketing events, revenue flows, and wine sales. It caters to wine enthusiasts and wineries, enhancing wine-related experiences and enabling informed decision-making.

Application Features and Functionalities

- User Registration and Authentication: Secure account creation and login.
- Product Catalog: Detailed descriptions, prices, and ratings for wines.
- Search and Filtering: Find wines based on criteria like type and price.
- Shopping Cart and Checkout: Add wines, review the cart, and complete purchases.
- Reservations and Tastings: Book wine tastings and manage reservations.
- Feedback and Ratings: Write reviews and rate purchased or tasted wines.
- Customization for Special Occasions: Customize wine labels or packaging.
- Coupons and Discounts: Apply codes for discounts during checkout.
- Analytics and Reporting: Generate insights on sales and customer behavior.
- Admin Panel: Manage inventory, and user accounts, and generate reports.

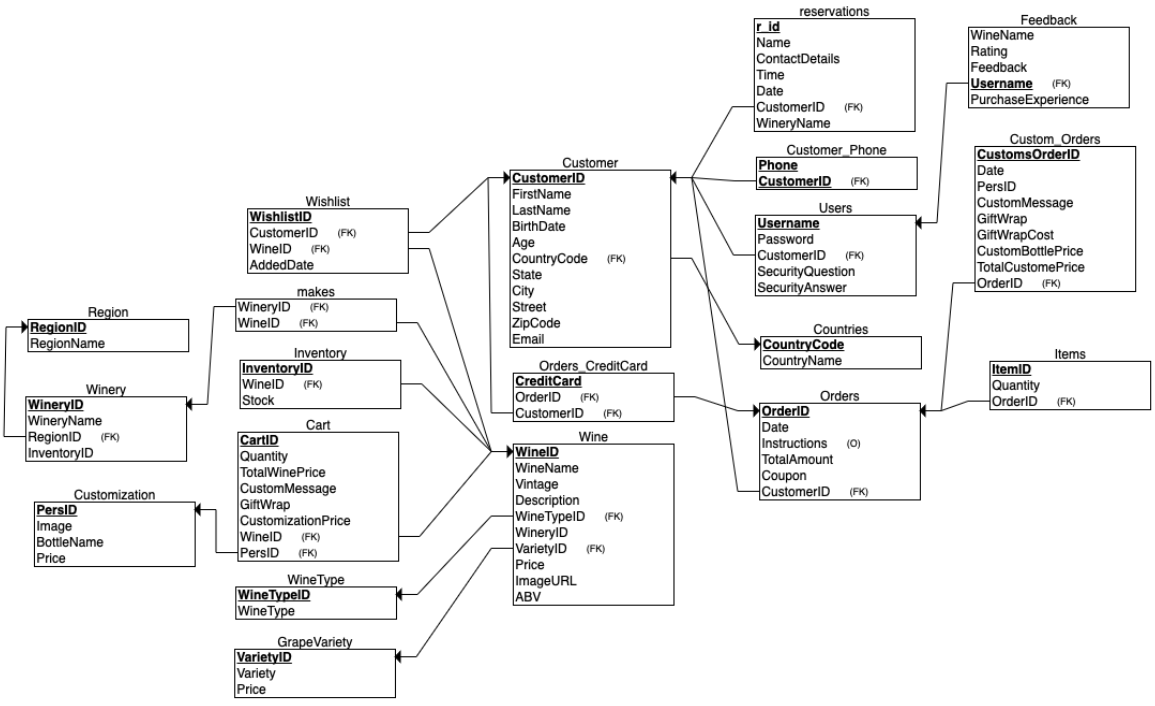
ER DIAGRAM

- OPERATIONAL- ER Diagram

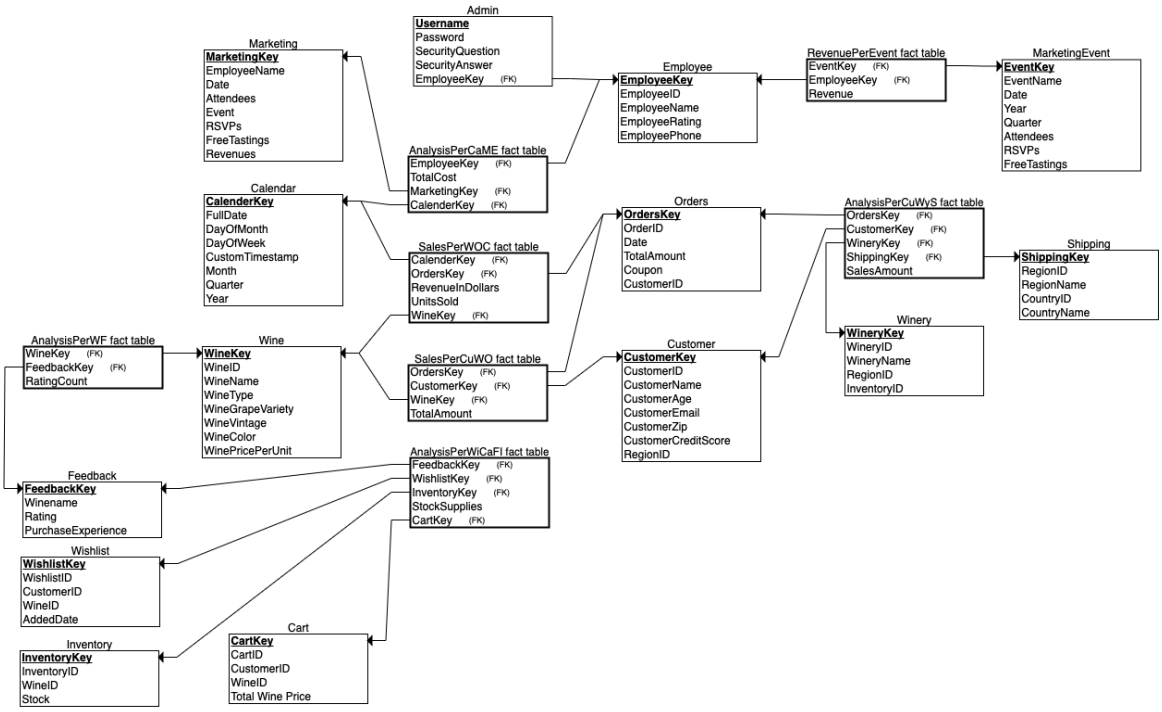


The ER diagram depicts the structure and relationships of entities in the operational database of the wine e-commerce application. It includes entities like Customers, Wine, Winery, Orders, Feedback, Reservations, and Inventory, along with their attributes. The diagram represents the connections and associations between these entities.

- OPERATIONAL- Relational Schema



- ANALYTICAL - Star Schema



The ER diagram illustrates the structure and relationships of entities in the Analytical Database for reporting and analytics. It includes entities like Sales, Customers, Products, Feedback, and Orders with their attributes, emphasizing the connections necessary for data analysis. The diagram supports data-driven insights into user behavior, wine sales, and relevant metrics through fact and dimensional tables.

SYSTEM ARCHITECTURE

Database Design

- Data Extraction: Data is extracted from the Operational Database, including relevant information such as sales data, customer details, product attributes, reviews, and ratings.
- Data Transformation: The extracted data undergoes a transformation process to cleanse, format, and prepare it for analytical purposes. This may involve data normalization, aggregation, calculations, and other transformations based on the requirements of the analytical database.
- Data Loading: The transformed data is then loaded into the Analytical Database, where it can be stored in a format optimized for analytical processing, such as a star schema or a data mart.
- Querying and Reporting: With the integration in place, we can leverage the Analytical Database to perform complex queries, generate reports, and derive insights from the consolidated data. This supports decision-making processes, identifies trends, and helps in understanding user behavior, sales patterns, and overall business performance.

ETL PROCESSES

Integration between the Operational and Analytical Databases plays a crucial role in ensuring a seamless flow of data and enabling comprehensive analysis for the wine e-commerce application. The integration allows for the extraction, transformation, and loading (ETL) of relevant data from the Operational Database to the Analytical Database.

The ETL (Extract, Transform, Load) process is essential in data warehousing to integrate and organize data from various sources into fact and dimensional tables. In the first step of the process, data is extracted from operational tables such as "feedback," "calendar," "customers," and "orders" using SQL SELECT queries. This extracted data is then transformed using SQL queries to apply any necessary data manipulations, join tables, aggregate data, and enforce business rules. During this transformation phase, the data is prepared to fit into the desired structure of the fact and dimensional tables such as SalesPerWOC, AnalysisPerWF, etc. Once the data is transformed, it is loaded into the data warehouse using SQL INSERT INTO queries, ensuring that the transformed data is organized and stored efficiently for querying and analysis.

By leveraging notebooks with SQL queries, the ETL process becomes more manageable and reproducible. These notebooks allow for seamless execution of the extraction, transformation, and loading steps. The SQL queries within the notebooks extract data from operational tables, transform it to match the structure of fact and dimensional tables, and then load it into the data warehouse. This structured approach ensures data integrity and consistency throughout the ETL process, enabling organizations to efficiently update their fact and dimensional tables with data from operational sources, making it readily available for analysis and decision-making in the data warehousing environment. There is an ETL folder for each application where all the concerned notebooks and the their respective SQL scripts can be found.

DATA SOURCES

For our application, we have integrated data from external sources to enhance its functionality and provide accurate and valuable information to users. The following external data sources have been utilized:

1. *WINE and Winery Data from https://buywinesonline.com/*: We have fetched comprehensive wine and winery data from the website https://buywinesonline.com/. This includes some wine descriptions, pricing, winery profiles, regions, and varietals.
2. *Customization details from https://www.personalwine.com/labels*: To offer a personalized experience, we have extracted customization details from https://www.personalwine.com/labels. This website specializes in personalized wine labels and packaging. Our application accesses customization options, including customization choices, and pricing information.
3. *Mockup data from https://www.mockaroo.com/:* During the development phases, we utilized https://www.mockaroo.com/ to generate realistic mockup data. This allowed us to simulate various scenarios and test the application's functionality with sample data.

IMPLEMENTATION

Technologies Used

- Relational Database Management System (RDBMS): MySQL
- Entity-Relationship Modeling Tools: ERD Plus

This tool assisted in creating and visualizing the ER diagrams and the Star Schema.

SQL (Structured Query Language): SQL was used for managing relational databases. It is utilized to define and manipulate the database structure, perform queries, and manage the data stored in the database.

- Python and PyQt5 GUI- For building the front end of our application.
- CSS

OPERATIONAL APPLICATION - `WINEHAVEN'

- **LOGIN PAGE**

The Winehaven Login page is a user-friendly interface created using the Qt framework. It features a well-structured layout with the company logo, input fields for username and password, and buttons for signing in, resetting passwords, and signing up. Key features of the Login page include the "Remember Me" option, which allows users to choose whether their login information should be remembered for future sessions.

The page also provides a "Forgot Password" feature that prompts users to answer a security question and reset their password if needed. Additionally, there is a "Sign Up" button for new users to create an account. The interface incorporates security measures and displays a security notice at the bottom of the page, ensuring users feel confident about their information's protection.

- **SIGNUP PAGE**

The Winehaven Signup page is a GUI dialog window that allows users to create a new account. It features fields for personal details, account details, and address details, as well as buttons for submitting and canceling the form. The form fields are implemented using various Qt widgets such as QLineEdit, QComboBox, and QDateEdit, and they are arranged in groups using QGroupBox and QFormLayout. The code also includes helper functions for interacting with a database, such as adding a new user account and retrieving security questions.

- **HOME PAGE**

The HomePage class represents the home page of the Winehaven app. It is a QDialog subclass that displays various tabs and content to provide a user-friendly interface for the app. Upon initialization, the class sets the window title and fixed size. It creates a QTabWidget to hold the tabs and defines several tab widgets such as Home, View Products, Make Reservation, Reviews, Offers, and Cart. Each tab is created as a QWidget with its own layout. The Home tab consists of an image banner and a label with a welcome message. The About Us section is displayed in a QGroupBox, which contains a QLabel with detailed information about Winehaven, including its selection of wines, passion for wine appreciation, and commitment to quality. A logout button is also added to the home tab, allowing users to log out and return to the login page. Other tabs, such as View Products, Make Reservation, Reviews, Offers, and Cart, are populated with additional widgets or pages relevant to their respective functionalities.

View Products Tab

This page displays a window of all the wines available. The UI has a vertical layout with a label, filter button, and scroll area to show wine widgets. When the filter button is clicked, the show_filter_dialog function is called. The wine data is fetched from a MySQL database and displayed in wine tiles that include the wine name, description, price, and image. Each wine tile has a WineTile widget that provides more details about the wine and allows the user to add it to their cart. The WineTile widget includes a wine image, wine name, description, price, and an Add to Cart button. The urllib.request.urlopen method fetches the image from the image URL, and the QPixmap method displays the image. The image is resized and cropped to fit in the wine tile widget.

For a more detailed look at a wine product, the quicklook method opens a dialog window displaying additional information about the wine, such as its vintage, type, grape variety, and an enlarged image. This allows users to make informed decisions and explore wines of interest.

Offers Tab

The "Offers" page in the application showcases a range of discounts and promotions available to customers. With a clean and user-friendly layout, the page presents the discounts dynamically retrieved from the database. Each discount is displayed as a label, providing the discount code and the associated amount. Terms and conditions specific to each offer are presented in a separate group box, emphasizing important details such as eligibility criteria, order value requirements, seasonal limitations, and usage restrictions.

Reservation Tab

The Reservation tab within the winery application serves as a user-friendly interface for customers to select their preferred date and time for a delightful wine-tasting experience at their chosen winery. Utilizing components such as QLabel, QPushButton, QCalendarWidget, and Time Edit label, the page offers intuitive input fields for users to provide their personal details, as well as select their desired date and time slot.

Moreover, the Reservation tab establishes a connection with the operational database by fetching the customer ID from the customer's table. This ensures that each reservation is associated with the appropriate customer, allowing for accurate record-keeping and personalized service. Once a reservation is made through the application, all relevant details, including the customer ID, date, time, and any additional notes, are stored in the reservations table of the database. This central repository of reservation information simplifies management and enables wineries to efficiently organize their wine-tasting schedules. To cater to the dynamic nature of reservations, the application also allows users to modify their existing reservations or cancel a reservation they made, if the need arises.

- **CUSTOMIZATION PAGE**

The customization page in the Winehaven application is a feature designed to enhance the user experience by allowing them to personalize their wine bottle labels with custom messages and choose gift wrap options. This report outlines the key features and functionalities of the customization page in the application developed using PyQt.

The customization page incorporates various functionalities of PyQT to provide users with seamless customization options.QFrame along with QVBoxLayout is used to put the base layout of the page.

The Frame holds the images of the customization bottle images along with the QLabel to display the price for each bottle querying the customization table from the mysql database.

The "Is It a Gift?" QCheckbox provides users with additional QLineEdit to enter the message and the option (checkbox to select gift wrap option. If the user selects the gift wrap QCheckbox, the QDialogButtonBox shows the notification that additional charges will be applied. The random custom_order id is generated, and Cart table is updated with the customization details. The Cart page is refreshed with the latest details fetched from the Cart table in the database.

- **CART PAGE**

The cart page allows users to view and manage their selected items before proceeding to checkout. It includes a refresh button to query the cart table in MySQL and update the cart page with any new changes. Additionally, each item displayed in the QTable provides a "Remove Item" button, which allows users to delete specific entries from the cart table and update the page accordingly. The cart page is designed with a QTable to display the cart items, along with the relevant information such as name, quantity, price, and the "Remove Item" button. Additionally, a refresh button is placed on the page.

PROCEDURE:

```
drop procedure get_cart_details;

CREATE PROCEDURE get_cart_details(IN cust_id INT)
BEGIN
   select w.WineName, sum(quantity),sum(w.price) as total_wine_price,
   case when bottle_name is not null then bottle_name else '' end as bottle_name ,
   case when sum(c.customization_price) is not null then ROUND(sum(c.customization_price),2) else
0.00 end as customization_price,
   sum(case when gift_wrap is True then 3.99 else 0 end ) as gift_wrap_cost,null
   from bossbunch_db.Cart c
   inner join bossbunch_db.Wine w
   on c.WineID = w.WineID
   left join bossbunch_db.customization pers
   on c.pers_id= pers.pers_id
   where CustomerID={cust_id}
   group by CustomerID,w.WineName,bottle_name
   ;
END //
```

- **CHECKOUT PAGE**

The checkout page allows users to review their selected items, apply customization options, calculate the final amount, and enter coupon codes for discounts. The page dynamically adjusts the QGridLayout based on the number of items in the cart, includes customization bottle costs and gift wrap costs, and validates birthday coupons based on the user's birth month.
To accommodate the variable number of items in the cart, the checkout page implements a QGridLayout that dynamically adjusts its size and layout based on the number of items. The QGridLayout adapts to display the necessary information for each item, such as its name, quantity, price, and customization options. The checkout page includes selected customization options and

associated costs are displayed. Additionally, if the user opts for gift wrap, the corresponding cost is also displayed. These costs are factored into the final amount calculation.

The checkout page provides a QLineEdit field where users can enter coupon codes to apply discounts. The application validates the entered coupon code to ensure its authenticity and applicability. Once the user has reviewed and customized their order and entered a valid coupon code, the checkout page calculates the final amount to be paid.

- **ORDER PAGE**

The order page allows users to view and update their personal information, select a payment method, enter credit card details, and place their order. The page fetches and displays the user's name and address from the customer table, along with the total amount to be paid calculated on the previous checkout page. It also provides a list of previously used credit card details, allows users to enter a new credit card, validates the entered credit card information, and securely displays the credit card details.

The order page fetches the user's name and address for review from the customer table. It prominently displays the total amount to be paid, including item costs, customization, gift wrap, and coupon discounts. Users can conveniently select previously used credit card details or enter new ones, with validation for accuracy and security. The order page validates the entered credit card information, ensures the correct card number format, identifies the card type, and displays the CCV in a masked format for enhanced security.

- **REVIEW PAGE**

The "Reviews" page features two buttons, "My Reviews" and "Provide Your Feedback," styled with white text on a black background. "My Reviews" allows users to view their own reviews, while "Provide Your Feedback" directs them to a separate feedback page for submission. Below the buttons is a wine dropdown menu labeled "Select a wine," enabling users to choose a specific wine and dynamically update the displayed reviews. An average rating label displays the selected wine's average rating, and a scrollable area showcases the reviews fetched from a database. At the bottom of the page, a security notice emphasizes user security and includes the WineHaven copyright notice.

The page also includes a QLabel widget for the wine dropdown prompt and a QComboBox widget for wine selection. The average rating label is displayed using a QLabel, while the reviews are organized in a scrollable area using a QVBoxLayout and QWidget. A QLabel is added for the security notice, and the wine names for the dropdown menu are populated through a method connected to the database.

- **FEEDBACK PAGE**

The "Feedback" page provides a user-friendly platform for users to share valuable feedback and ratings for wines and their purchase experience. It includes input fields and dropdown menus for selecting the wine, rating the experience, and providing additional comments. The page dynamically populates the wine dropdown menu and rating options, ensuring accurate and comprehensive feedback. The submitted feedback securely connects to the database, storing relevant information such as wine name, ratings, feedback, and the user's username. A confirmation message appears after submission, and the page emphasizes security and support with a notice reassuring users and inviting them to contact support if needed.

The page layout incorporates various widgets, including the wine dropdown (QComboBox), rating dropdowns (QComboBox), feedback form (QTextEdit), and submit button (QPushButton), all organized within a QVBoxLayout. The fill_wine_names method connects to the database to populate the wine dropdown menu. The submit_review method is connected to the submit button's clicked signal, handling the retrieval and insertion of feedback into the database, with form fields cleared after submission. Overall, the "Feedback" page ensures a seamless and satisfying experience for users to provide detailed feedback on wines and their purchase experiences, while maintaining data security and customer support.

- **MY REVIEWS PAGE**

The "My Reviews" page offers users a visually appealing and user-friendly interface to view and manage their submitted reviews. The page initializes a table using the QTableWidget class, displaying columns for wine names, ratings, feedback, and a delete button. The table is populated with the user's reviews retrieved from the database, and the delete button allows users to remove specific reviews, ensuring accurate reflection of their feedback. A security notice at the bottom of the page emphasizes data security and invites users to address any concerns.

The table's initialization involves creating a QTableWidget and configuring its columns and labels. The retrieved reviews are then added to the table, adjusting column widths for readability. Each row in the table includes a delete button connected to the delete_review method for handling review deletion. The page layout is organized using a QVBoxLayout, with the table and security notice added to the layout. The delete_review method removes the selected review from both the table and the database.

ANALYTICAL APPLICATION – 'CELLAR INSIGHTS'

- **LOGIN PAGE**

The Login class in the Cellar Insights Winehaven application is a QWidget that serves as the login page for administrative users. The Login class in the Cellar Insights Winehaven application is a QWidget serving as the login page for administrative users. It features a clean and intuitive interface with elements such as the Winehaven logo, username, and password fields, a sign-in button, a "Remember me" checkbox, a "Forgot Password" button, and a security notice. The username and password fields collect user credentials, the sign-in button triggers the login function for verification, and the "Remember me" checkbox allows users to save their login details for future sessions. The "Forgot Password" button enables users to reset their password through a security question system. Data persistence is handled using the QSettings class, storing and retrieving the username, password, and "Remember me" status.

The sign-in button triggers the login function, which verifies user credentials against the database. The "Remember me" checkbox offers convenience for subsequent logins, and the "Forgot Password" button allows users to reset their password. A security notice reinforces the importance of user security.

- **HOME PAGE**

The home page of Winehaven includes several tabs with different analytical features. The tabs consist of:

1. Home: It provides an overview of the tool's purpose, highlights key features, and displays a welcome message and an image related to Winehaven.
2. Revenue Tracking: Users can track Winehaven's financial performance over time, gaining insights into revenue drivers and making informed decisions to enhance profitability.
3. Marketing Insights: Users can evaluate the effectiveness of marketing campaigns and events, analyzing different strategies and optimizing efforts based on gained insights.
4. Inventory Management: This tab focuses on monitoring and managing Winehaven's wine inventory, enabling users to track stock levels and meet customer demands while avoiding stockouts.
5. Wine Sales Analysis: Users gain insights into customer ordering patterns and preferences through rating and feedback data, helping Winehaven improve offerings and enhance customer satisfaction.
6. Offers & Promotions: Users can analyze the success of offers and promotions, understanding customer preferences and behavior to plan future strategies for attracting and retaining customers.

DASHBOARD 1 - Revenue Insights

The Revenue Insights tab in the Cellar Insights Winehaven app offers a user-friendly dashboard for comprehensive revenue data analysis in wine businesses which includes,

- Year and Quarter Selection: Users can choose a specific year and quarter to analyze revenue data, providing flexibility in exploring trends over different time periods.
- Revenue or Units Sold Selection: Users can analyze either revenue or units sold, with a breakdown table showing detailed information on wine revenue or units sold for the selected year, quarter, and wine.
- Revenue Analysis Table: This table displays a detailed breakdown of wine revenue or units sold, allowing easy comparison and identification of top-performing wines.
- Maximum Revenue Wine Label: The label dynamically shows the wine with the highest revenue or units sold for the selected year and quarter.
- Yearwise Analysis Button: Users can access a separate dialog window for an in-depth analysis of revenue and units sold trends over multiple years.
- Visualize Data Button: Clicking this button generates a line graph visualization of revenue or units sold trends for each wine, facilitating pattern identification and comparisons.
- The Revenue Insights tab utilizes a live database connection for accurate and up-to-date revenue analysis. Users can explore revenue trends, identify top performers, and make informed decisions based on the provided insights.

DASHBOARD 2 - Marketing Insights

The Marketing Insights tab in the Cellar Insights Winehaven app offers a comprehensive overview of marketing data and insights for the wine business which include,

- Total Marketing Revenue Over Years: A line chart that provides a snapshot of revenue trends over time.
- Total Attendees and RSVPs: A horizontal stacked bar chart displaying the number of attendees and RSVPs for each event, giving insights into event interest and turnout.
- Top 4 Employee Performance: A horizontal bar chart showcasing the top-performing employees based on revenue generation, with color intensity representing average ratings.

- Correlation between Free Tastings and Revenue: A scatter plot showing the relationship between the number of free tastings and revenue generated, including a regression line for correlation analysis.
- These visualizations utilize live data from the database, ensuring accuracy and real-time representation of marketing performance. The Marketing Insights tab also provides interactive filter widgets for selecting specific years and events, empowering users to focus on their areas of interest. The filters are seamlessly connected to the charts, updating the displayed data accordingly. Error messages are displayed when selecting an event that was not conducted in the chosen year, ensuring data availability and clarity for users.

DASHBOARD 3 - Inventory Alert

The Inventory Alert page in the Cellar Insights Winehaven app provides a convenient and efficient way to monitor wine inventory which include,

- Querying Inventory Table: The page utilizes the callproc method to execute a stored procedure in the database, fetching the stock details of all wines from the inventory table. This ensures efficient retrieval of the required information.
- Displaying Stock Details: The stock details of all wines are presented in a QTableWidget using PyQt. The table provides a tabular representation with columns for wine name, current stock count, and other relevant information. Each row corresponds to a wine, giving a comprehensive overview of the stock status.
- Highlighting Low Stock Wines: Wines with a stock count below 20 are highlighted in red, drawing attention to low stock levels. This visual alert system enables quick identification of wines that require immediate action, such as restocking, to maintain adequate inventory levels.

```
CREATE PROCEDURE get_stock_details()
BEGIN
        SELECT Winename, Stock FROM bossbunch_wh.`Inventory` I
         inner join bossbunch_wh.`Wine` w
         on I.WineID = w.WineID
         ORDER BY Stock ASC;
END //
DELIMITER;
```

DASHBOARD 4 - Wine Analysis

The Wine Analysis Dashboard in the Cellar Insights Winehaven app offers valuable insights into the wine industry through four graphs through a dashboard,

- Top-Selling Wines Bar Graph: This graph displays the top-selling wines based on revenue. Wine IDs are shown, and a dropdown list allows users to fetch the corresponding wine names. This visualization helps identify the most successful wines in terms of revenue.
- Grape Variety Distribution Pie Chart: This chart visually represents the distribution of grape varieties across all wines. It provides a clear understanding of the composition and prevalence of different grape varieties used in winemaking.
- Wine Sales Trends Line Graph: This graph illustrates the sales trends by showing the number of units sold over a specific period. It helps identify patterns, trends, and potential sales opportunities for wineries.

- Customer Ratings Donut Chart: This chart offers an overview of customer ratings provided in the feedback table. It summarizes the ratings given by customers, providing wineries with valuable insights into customer satisfaction and preferences.

The Wine Analysis Dashboard employs a QSplitter widget, allowing users to adjust the size and view two graphs simultaneously. By dragging the splitter, users can resize the graphs and compare data side by side, enhancing usability and enabling a more comprehensive analysis of the wine-related data. The QSplitter widget contributes to a flexible and user-friendly interface, empowering users to explore and interact with the graphs effectively.

DASHBOARD 5 - Discount Analysis

The Discount Analysis tab in the WineHaven application provides valuable insights for strategic decision-making and optimization of discount campaigns. It includes two graphs:

- Bar Chart - Revenue by Coupon Codes: This chart displays the revenue generated by different coupon codes over the past three years. Each bar represents a specific coupon code and its associated revenue. The chart allows for a quick understanding of the popularity and effectiveness of different codes.

```
create view bossbunch_wh.coupon_analysis as
select Coupon,year,round(sum(TotalAmount),2) from bossbunch_wh.SalesPerWOC sp
inner join bossbunch_wh.Orders o
on sp.OrdersKey= o.OrdersKey
inner join bossbunch_wh.Calendar c
on sp.CalendarKey = c.CalendarKey
group by Coupon,year
order by Coupon,year
;
```

- Line Chart - Overall Coupon Revenue: This chart shows the overall coupon revenue for each year since 2018.

```
create view bossbunch_wh.overall_coupon_rev as
select year,month,round(sum(TotalAmount),2) from bossbunch_wh.SalesPerWOC sp
inner join bossbunch_wh.Orders o
on sp.OrdersKey= o.OrdersKey
inner join bossbunch_wh.Calendar c
on sp.CalendarKey = c.CalendarKey
    group by year,month
    order by year,month;
```

CUSTOM STYLESHEETS

We have implemented a custom stylesheet and color palette to ensure a cohesive and visually appealing appearance for both the Winehaven shopping app and the Cellar Insights - Winehaven Analytics app. This process involves defining a color palette with primary, secondary, tertiary, background, and text colors using hexadecimal codes. We create a QPalette object in PyQt to manage and assign colors to different parts of the application's widgets, ensuring consistency by setting the color roles to the corresponding colors from our defined palette.

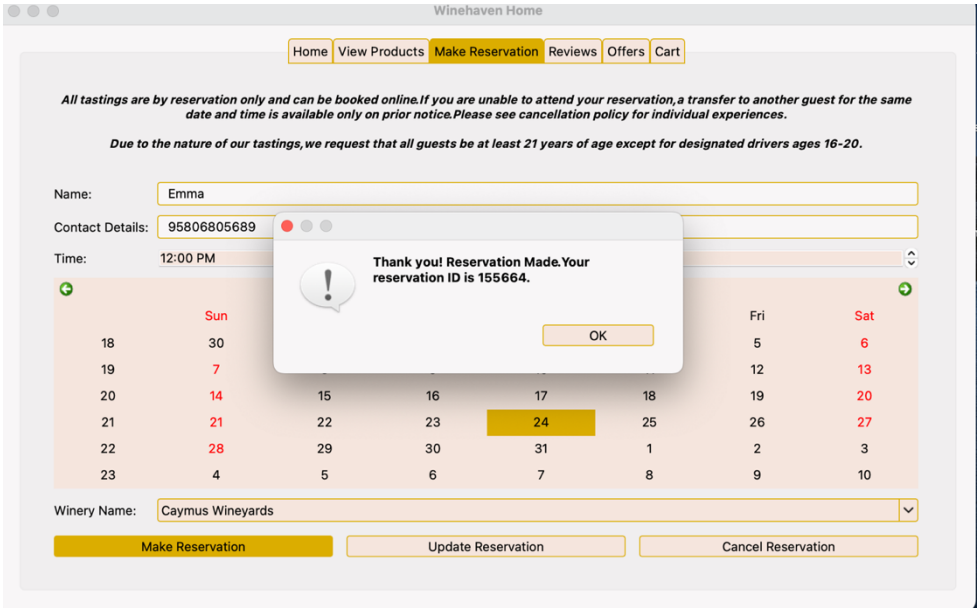
To further customize the visual aesthetics, we define a stylesheet as a multi-line string, inspired by CSS stylesheets, to finely customize the appearance of various widget types. We utilize the colors from our palette, along with additional style properties, to achieve the desired visual effects. By applying the customized palette and stylesheet to the applications using the setPalette and setStyleSheet methods of the QApplication object, respectively, we ensure that the defined styles and colors are uniformly applied to the widgets, resulting in a consistent and visually pleasing user interface.

Through the integration of this custom stylesheet and color palette, we have successfully achieved a unified and visually pleasing design across both the Winehaven shopping app and the Cellar Insights - Winehaven Analytics app. The flexibility and versatility of PyQt's styling capabilities have allowed us to create personalized and aesthetically pleasing user interfaces for our applications, enhancing the overall user experience.

USER SCENARIOS AND SCREENSHOTS

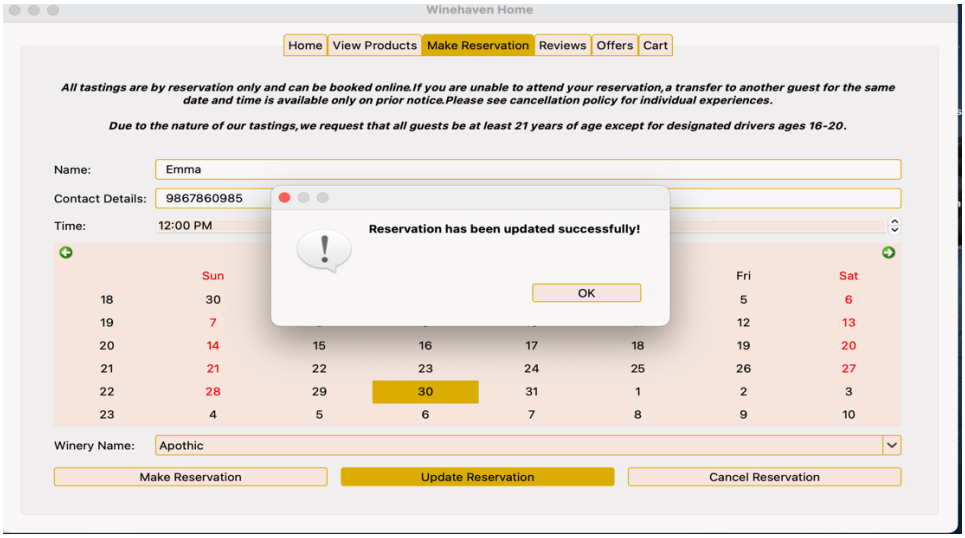
- Scenario: Making a Reservation

  User: Emma, a wine enthusiast
  Details: Emma wants to visit the Caymus Wineyards for a wine-tasting experience. She opens the winery application, selects the Make Reservation tab, and chooses a preferred date and time from the available options. She enters her contact information and completes the reservation. Emma then receives a confirmation message with a unique reservation ID.



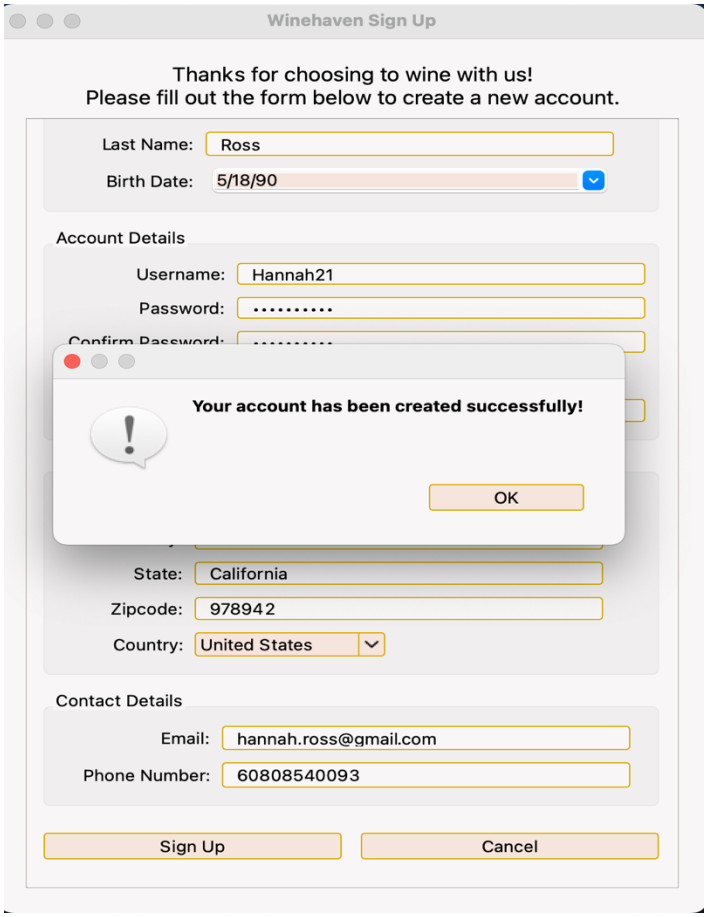
- Scenario: Updating a Reservation

  User: Emma, a winery customer
  Details: Emma needs to update her existing reservation at a winery. He opens the application and navigates to the reservation section. He selects the option to update a reservation and is prompted to enter the reservation ID and the other details necessary to update the reservation.



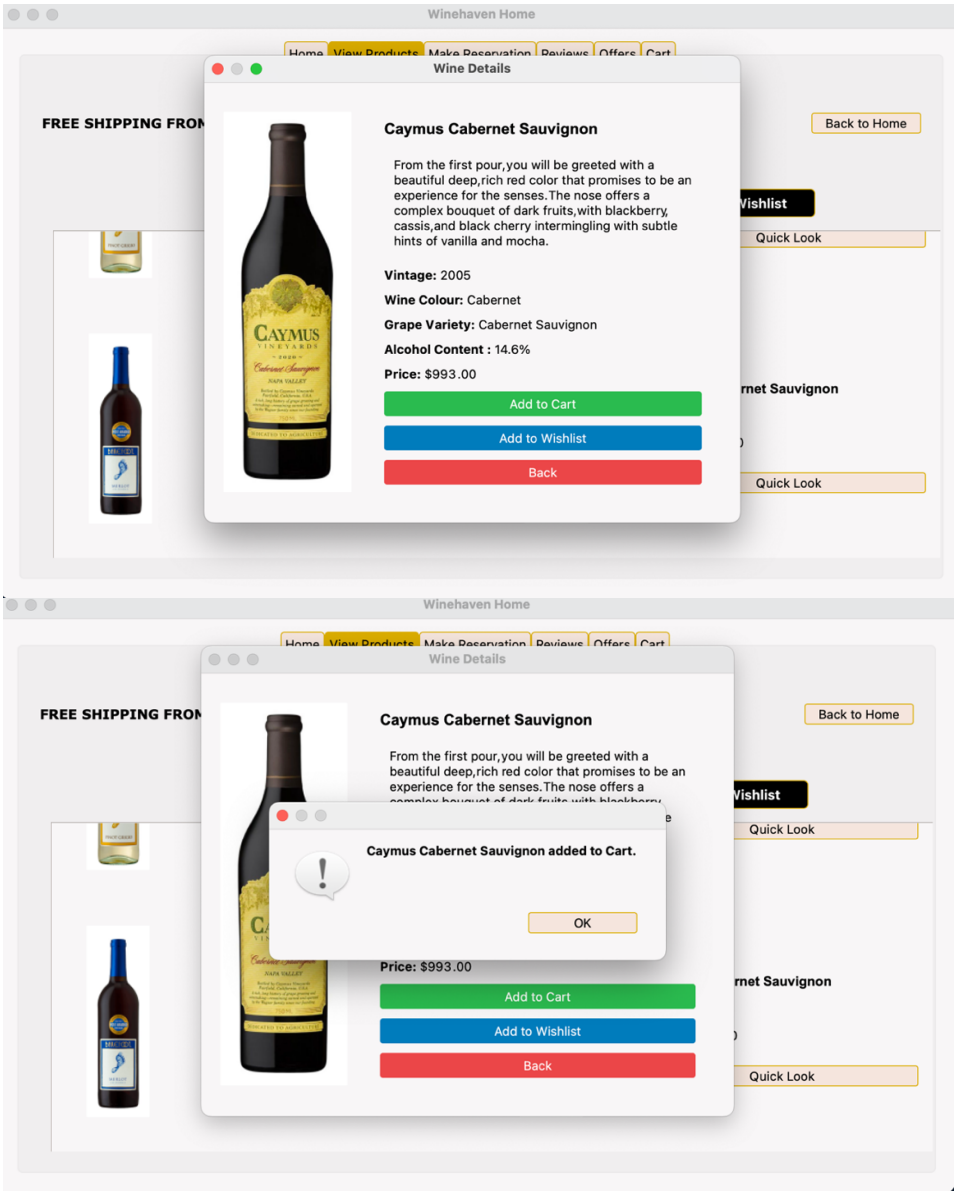
- Scenario: Creating an Account

  User: Hannah, a wine enthusiast
  Details: Hannah discovers the Winehaven application and decides to create an account to start using its features. She visits the Winehaven website and clicks on the "Sign Up" button. Emily is directed to the registration page where she enters her personal details After filling in the required information, Hannah clicks on the "Create Account" button. Hannah can now access all the features and benefits that Winehaven offers, including browsing wines, making reservations, leaving reviews, and enjoying a personalized wine experience.



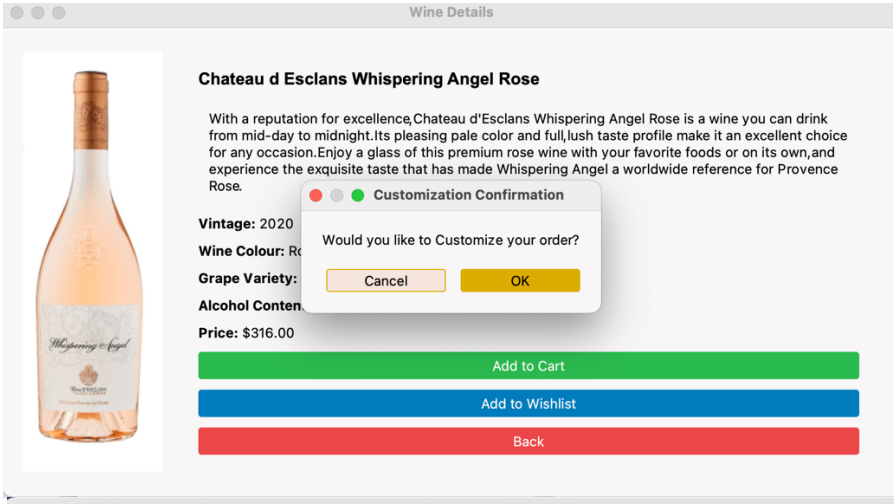
- Scenario: Adding a Wine to the Cart

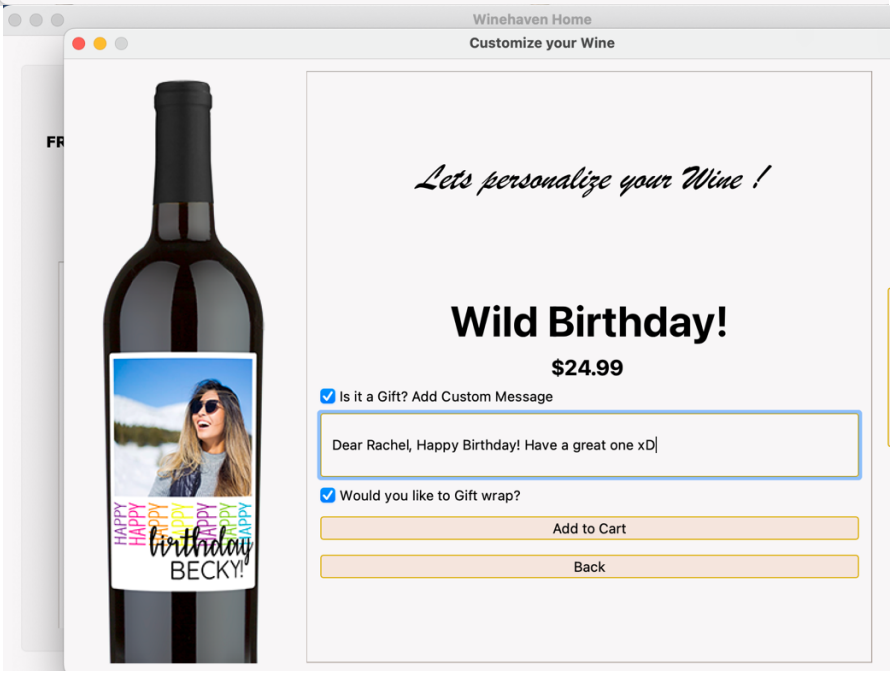
  User: Maria, a wine enthusiast
  Details: Maria is browsing the application to explore and purchase wines. She comes across a wine that catches her interest. She navigates to the View Products section of the application and selects the desired wine from the available options. She reads the wine's description and pricing information. Impressed by the details, Maria decides to add the wine to her cart. She clicks on the "Add to Cart" button. The application promptly confirms the addition of the wine to her cart and displays a message notifying her of the successful addition. Maria can now proceed to the Cart section of the application to review her selected wines and proceed with the checkout process.



- Scenario: Customizing Wine Labels

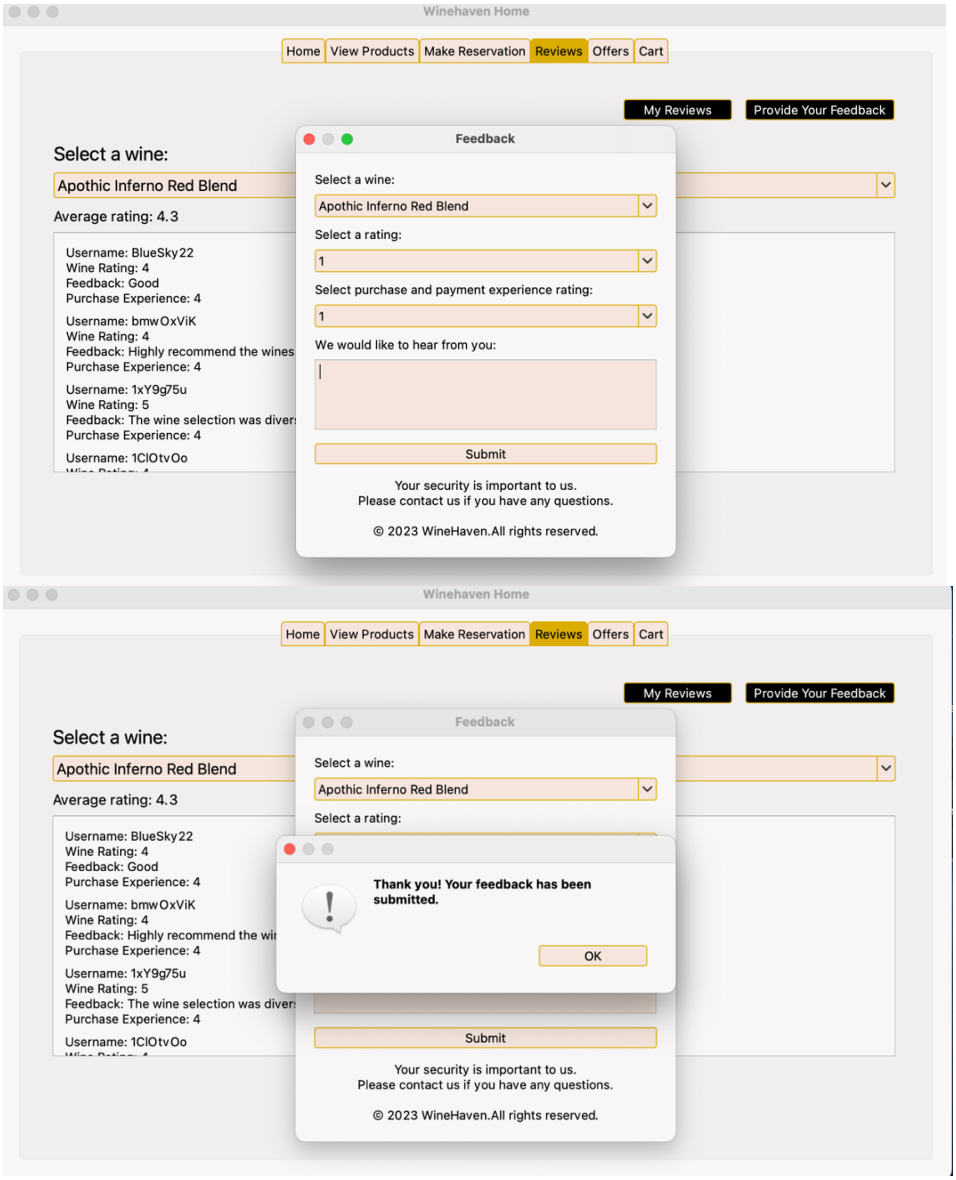
User: Lisa, a gift shopper
Details: Lisa wants to purchase a bottle of wine as a gift for her friend's birthday. She visits the winery application and selects wine from the catalog. As an added touch, Lisa utilizes the customization feature to design a personalized wine label with her friend's name and a birthday message. The application provides design options and previews the customized label. Lisa completes the purchase, knowing that the wine will have a unique and meaningful touch.





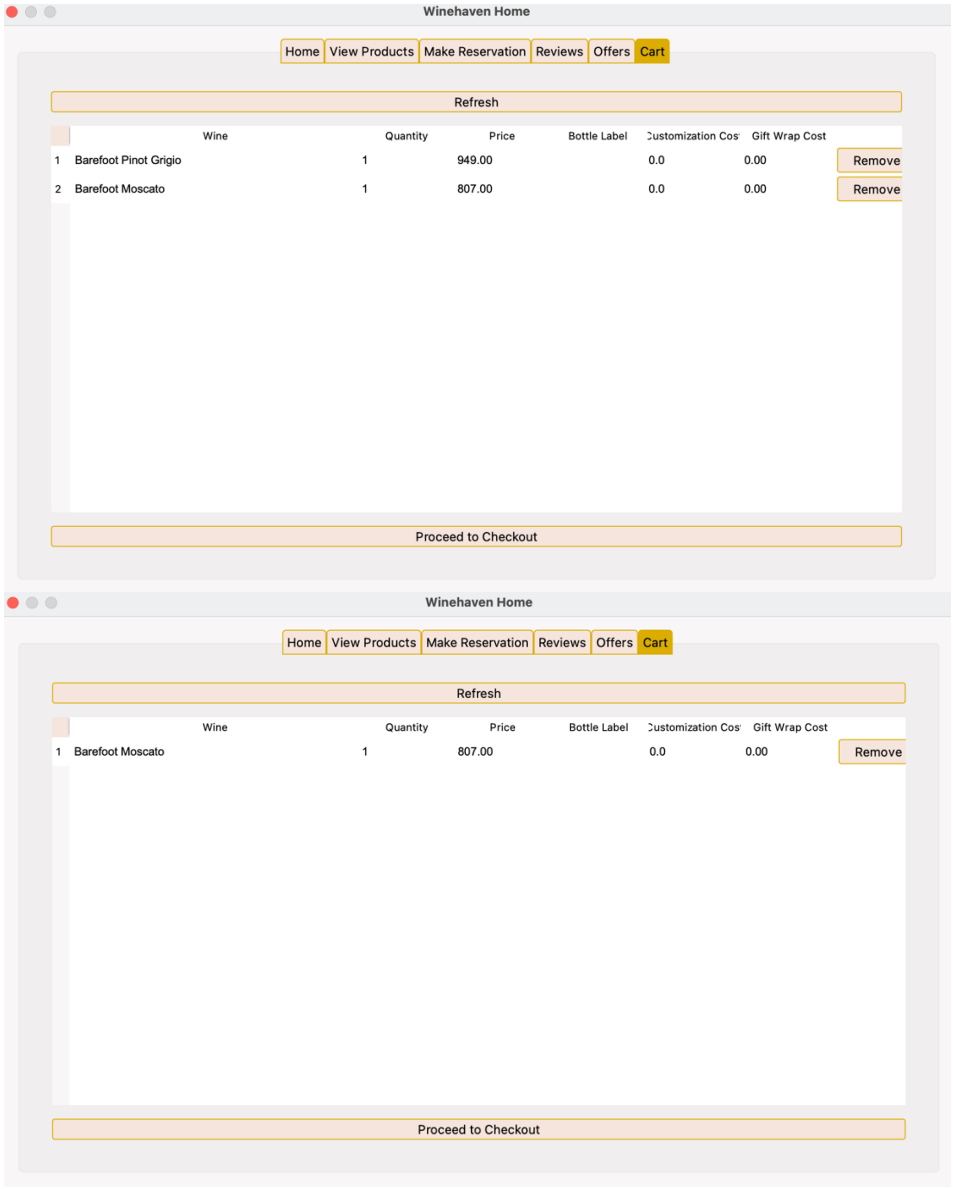
- Scenario: Providing Feedback and Reviews

User: Sarah, a frequent wine consumer
Details: Sarah recently purchased a bottle of wine from the winery application. She accesses the Reviews section and shares her experience by writing a detailed review and providing ratings for the wine. Sarah's feedback helps other users make informed purchasing decisions and provides valuable insights to the winery for quality improvement.



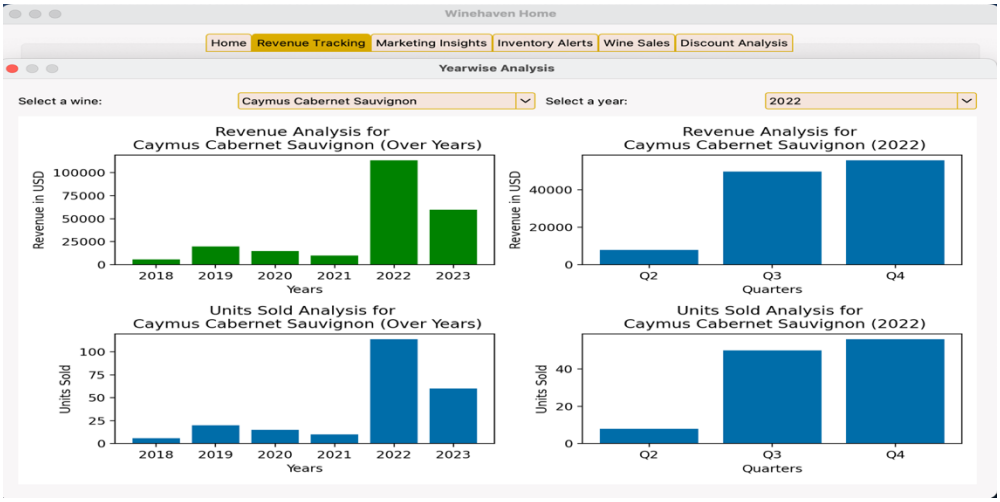
- <u>Scenario: Removing Selected Wines from the Cart</u>

  User: Sarah, an avid wine enthusiast
  Details: Sarah opens the Winehaven shopping app, selects specific wines from her cart for removal, and confirms the deletion. The app promptly removes the selected wines from the cart, updating the view accordingly. Sarah proceeds with her revised cart, either continuing to shop or proceeding to the checkout.



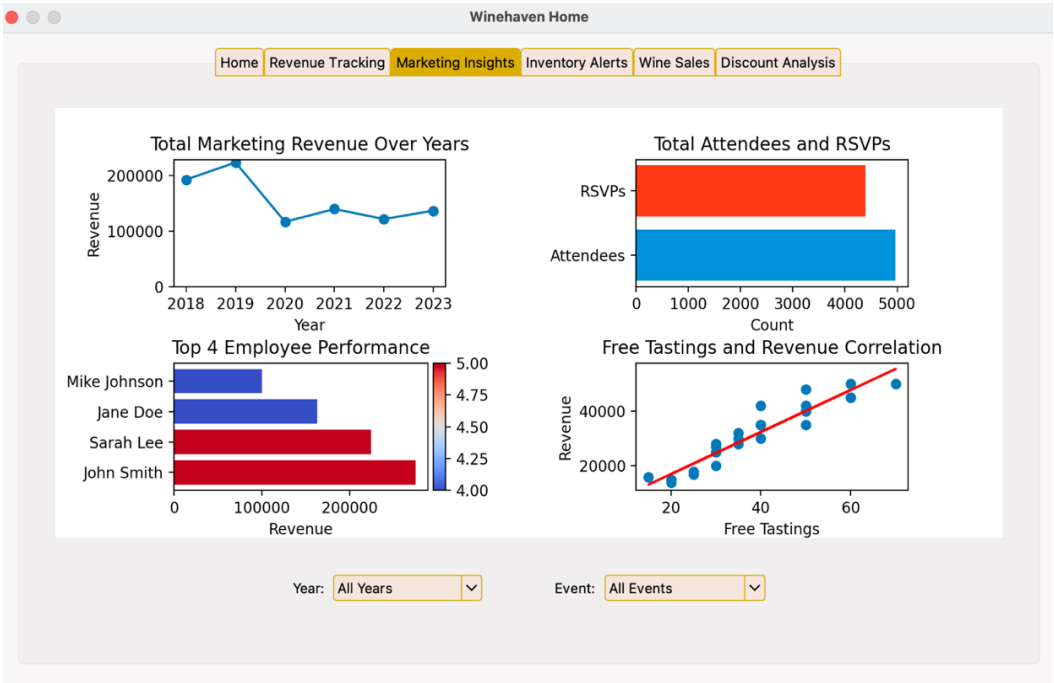
- <u>Scenario: Analyzing Wine Sales Trends</u>

  User: David, a winery owner
  Details: David wants to assess the sales trends of his winery's products. He logs into the winery application, accesses the Wine Analysis Dashboard, and views the line graph illustrating the Wine Sales Trends. David analyzes the Rating Overview and the Variety Distribution of specific wine varieties over time.



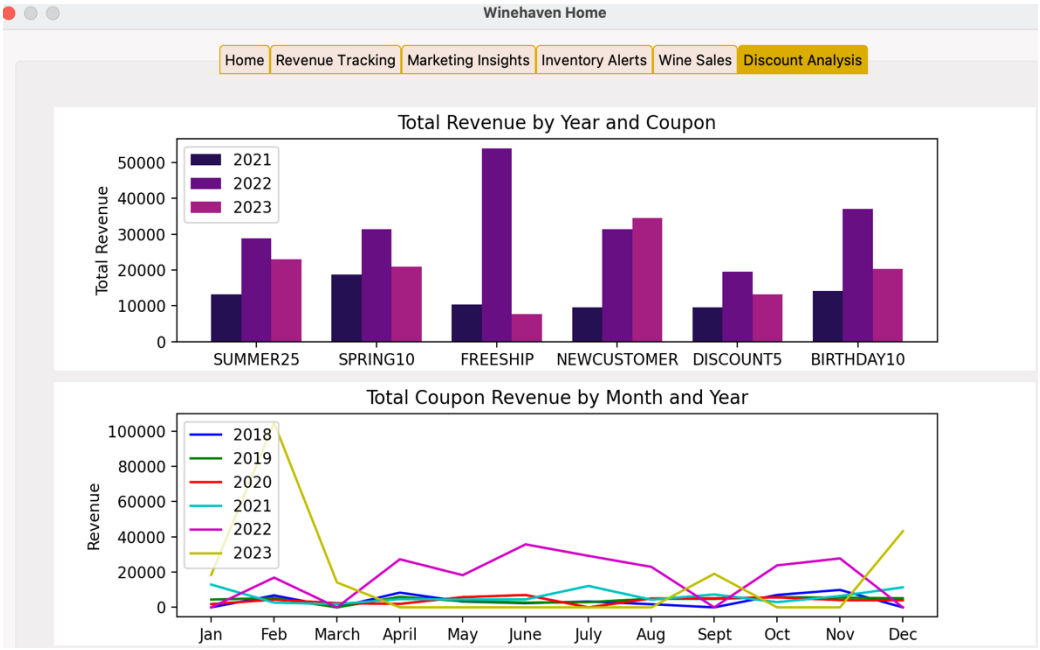
- Scenario: Analyzing Marketing Events Data

  User: Alex, a marketing manager at a winery
  Details: Alex is responsible for managing and analyzing marketing events conducted by the winery. They want to gain insights into the effectiveness and success of various marketing campaigns such as Free tastings and events, and top employees. Alex logs into the winery application and accesses the Marketing Events Dashboard.



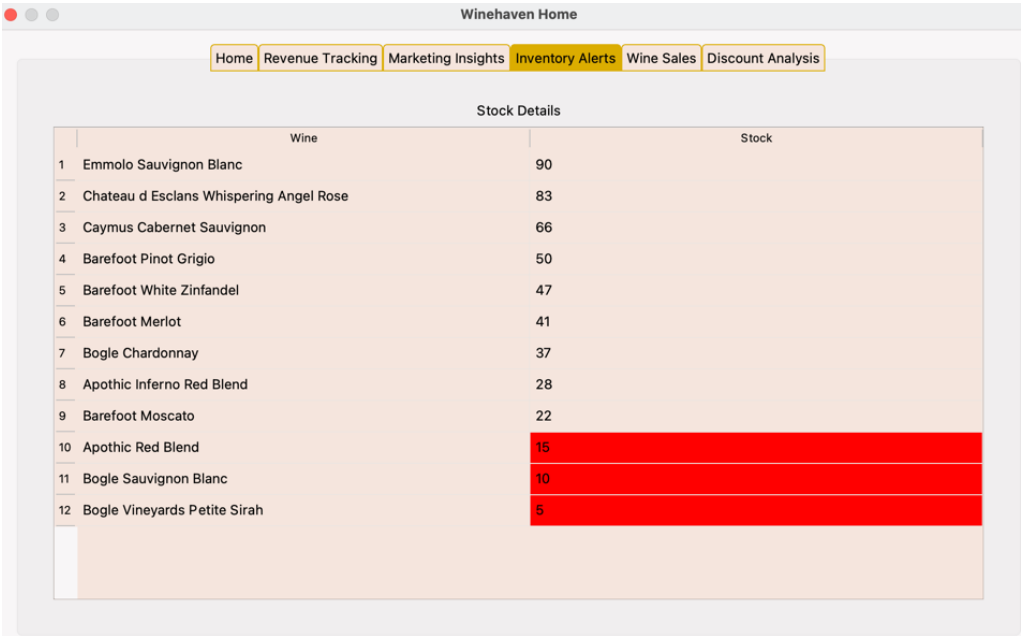
- Scenario: Analyzing Discount and Coupon Usage

  User: Laura, a marketing analyst
  Details: Laura is responsible for tracking the effectiveness of discount campaigns and coupon usage. She utilizes the winery application's analytics dashboard to analyze the impact of various discounts and coupon codes on sales. Laura can identify trends, evaluate the success of different promotions, and make data-driven decisions to optimize future marketing strategies.



- Scenario: Managing Wine Inventory

  User: Jessica, a winery manager
  Details: Jessica needs to update the winery's wine inventory. She logs into the winery application's Inventory Management tab and reviews the current stock levels to ensure accurate and up-to-date inventory information.



	Wine	Stock
1	Emmolo Sauvignon Blanc	90
2	Chateau d Esclans Whispering Angel Rose	83
3	Caymus Cabernet Sauvignon	66
4	Barefoot Pinot Grigio	50
5	Barefoot White Zinfandel	47
6	Barefoot Merlot	41
7	Bogle Chardonnay	37
8	Apothic Inferno Red Blend	28
9	Barefoot Moscato	22
10	Apothic Red Blend	15
11	Bogle Sauvignon Blanc	10
12	Bogle Vineyards Petite Sirah	5

RESULTS AND ACHIEVEMENTS

The winery application fulfilled the project requirements and goals by providing the following features,

- Inventory Management: Efficient tracking of wine quantity and availability.
- Sales and Customer Management: Tools to manage sales transactions, customer information, and order history.
- Effectiveness and Usability Analysis: User feedback and ease of use are indicators of effectiveness.
- User Feedback: Gathered to assess customer satisfaction and effectiveness.
- Ease of Use: User-friendly interface and intuitive workflows enhance usability.

FUTURE ENHANCEMENTS

To further enhance the winery application, the following recommendations can be considered:

1. Advanced Analytics: Integrate advanced analytics and Machine Learning, such as recommendation systems, to personalize user experiences, increase engagement, and improve customer retention.
2. Mobile Application: Develop a mobile version of the application to provide convenient access and management of information on the go, catering to the growing use of mobile devices.

CONCLUSION

The winery application successfully provided a comprehensive platform, achieving streamlined operations, enhanced customer experience, improved data management, and effective sales tracking. It brought value to both customers and wineries, improving efficiency and decision-making while offering a user-friendly experience.