

THE CRUSADERS

AN ONLINE TRAVEL AGENCY
MANAGEMENT SYSTEM PROPOSAL

TEAM

THE CRUSADERS

STUDENTS

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PROJECT BACKGROUND

Topic

The project's topic is a management system of an online travel agency named The Crusaders, embarked at Ho Chi Minh City. The Crusaders is a web-based service provider specializing in ecotourism, which offers cultural and natural experience tours, and accessories rental such as backpacks or tents. This project will facilitate the executive team including managers, marketing & sales team, and the customer support team of The Crusaders in overseeing their business operations effectively, while enhancing the interaction between their customers and their team significantly.

Looking at the tourism outlook of Vietnam, according to Asia Perspective (2020), the past decade witnessed the boom of Vietnam's tourism industry and successfully establish a large market share compared to other ASEAN rivals with robust growth up by 33% compared 2019, from both domestic and international travelers. The fact that Vietnam has successfully controlled COVID-19 boosts the domestic tourism and is the key factor to not only recover the tourism industry but also the national economy. Especially, Vietnam has the diverse natural and cultural tourism assets that is suitable for ecotourism development, as it ranks 32nd out of 120 countries and 3rd within the Southeast Asia region in terms of the attractiveness and volume of natural and cultural resources with 13,000 floral species and over 15,000 faunal species (World Economic Forum 2017).

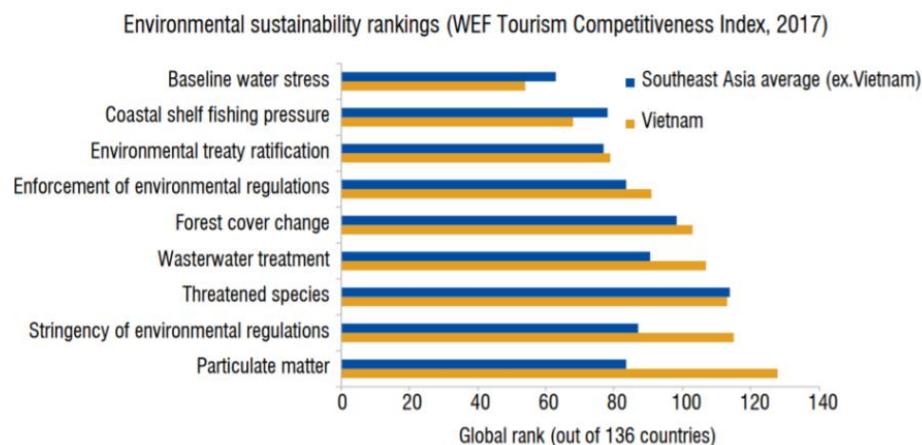


Figure 1. Vietnam lags the region in multiple dimensions of environmental sustainability
(World Economic Forum 2017)

damage from floating fishing villages significantly impact the marine wildlife; Son Doong cave is in fear of the cave ecosystem being damaged if the construction of cable car is allowed.

The Crusaders believes in the potentials of ecotourism that was yet to be deployed in Vietnam and wishes to become the leader of this market, which is the motivation for this project to be executed. The team wants to offer a better model for tourism development in Vietnam, which will not only bring the societal value as it minimizes the effects of human on natural and cultural environment, but also the economic value for the locals/minority ethnics in a sustainable way.

Despite such natural resource along with cultural integrity potentials, destinations which are the main tourism attractions are at risks, in accordance with World Bank (2019): Tourist-related constructions such as resorts or cable car in Sapa led to deforestation, traffic congestion and pollution; In Hanoi, heritages are replaced by modern infrastructure; In Ha Long Bay, emission from tourist boats and

People

Phan Le Minh An (s3878456)

With her background as an Economics and Finance first-year student having many organizational experiences, she is interested in the science of data and how to leverage it to make business decisions. Therefore, in this project, she plays the role of progress-tracking as well as developing an Oracle APEX application with a smart and efficient interface for the eco-tourism online travel agency.

Mai Doan Ngoc Han (s3751639)

Han is a student majoring in Economics & Finance who is interested in the sustainable growth of tourism in Vietnam and learning about the database management system. With experiences in both organisation management and data architecture design, Han is responsible for designing the database system as well as the entity-relation diagram, look after the business logic and check for the sensitivity and completion of relation schemas.

Pham Minh Viet (s3695319)

Viet is majoring in electrical and electronics engineering, who takes a keen interest in overcoming challenges. Despite lacking skills related to building a website prior to taking this course, Viet is willing to design and build a web application, especially taking charge of the front-end.

Tran Trong Tin (s3694839)

Tin is a final-year student in electrical and electronic engineering. Although he does not have any experience in MySQL, he still has good skills on coding and logical thinking skills and experiences on coding languages such as C/C++. Therefore, Tin is going to work with Han to construct and organize the database for the Travel Agency website for this project.

Scope

The Crusaders' website includes three main user types: customer, sales & support staff, and manager. Manager is the user type which has not only the same feature with staff user type, but further advanced permissions.

The table below demonstrates all features of the website. All features are assigned to a specific topic and prioritized differently.

- Basic activities: Customers, Partners, Staffs, Managers, Flight, Tour, Accessories, Booking bill
- Advanced activities: Sales Management, Inventory Management, Item Management, Provider Management, Employee Management, Customer Management

Priority level: High, medium, low.

Topic	Features	Priority
IN SCOPE		
N/A	<ol style="list-style-type: none"> 1. Go to homepage and other pages of the website using navigation bar and sections attached on the homepage. 2. Login using their registered usernames with corresponding passwords. 	High
User	<ol style="list-style-type: none"> 1. Create a User 2. View User List 3. Edit a User 4. Delete an user 	High
	<ol style="list-style-type: none"> 5. Search user by id, name, account, country, email, phone 6. Sort user list by id, name, account, country 	Medium
	<ol style="list-style-type: none"> 7. Calculate: <ul style="list-style-type: none"> • Total user • Number of male/female user • Number of user from different country 8. Find: <ul style="list-style-type: none"> • Countries that have the most user 	Low
Customer	<ol style="list-style-type: none"> 1. Create a Customer 2. View Customer List 3. Edit a Customer 4. Delete customers 	High
	<ol style="list-style-type: none"> 5. Search customers by id, address, rank, and support staff 6. Sort customers list by id, rank, and support staff 	Medium
	<ol style="list-style-type: none"> 7. Calculate: <ul style="list-style-type: none"> • Total customers • The number of customers that have the same rank 8. Find: <ul style="list-style-type: none"> • Countries that have the most customers 	Low
Sales & Support Staff	<ol style="list-style-type: none"> 1. View staff list 2. Create a staff 3. Edit a staff 4. Delete a staff 	High
	<ol style="list-style-type: none"> 5. Search staffs by id, and manager 6. Sort staff list by manager 	Medium
	<ol style="list-style-type: none"> 7. Calculate: <ul style="list-style-type: none"> • Total staffs • Number of staffs managed by a manager 8. Find: 	Low

	<ul style="list-style-type: none"> • Countries that have the most staffs 	
Manager	1. View manager list 2. Create a manager 3. Delete a manager	High
	4. Search manager by id 5. Sort manager list by id	Medium
	6. Calculate: <ul style="list-style-type: none"> • Total managers 	Low
Partner	1. View partner list 2. Create partner 3. Edit partner 4. Delete partner	High
	5. Search partner by id, name, country, and commission 6. Sort partner by id, name, country, commission	Medium
	7. Calculate: <ul style="list-style-type: none"> • Number of partners from a country • Number of partners managed by a manager 8. Find: <ul style="list-style-type: none"> • A manager who manages the most partner • Countries that have the most partner 	Low
	1. View tour list 2. Create tour 3. Edit tour 4. Delete tour	High
Tour	5. Search tour by id, details, start date, end date, company, and price 6. Sort tour by id, start date, end date, company, and price	Medium
	7. Calculate: <ul style="list-style-type: none"> • The number of tours is provided by a company • The number of tours starts on the same day • The number of tours ends on the same day • The number of tours has the same price • The average price 8. Find: <ul style="list-style-type: none"> • The most expensive/ cheapest tour • Companies that provided the most tour • The date that has the most/ least tour • The tours that have below average price 	Low
	1. View flight list 2. Create flight 3. Edit flight 4. Delete flight	High

	<p>5. Search flight by id, location (from and to), transit point, date, price, and company</p> <p>6. Sort flight by id, location (from and to), transit point, date, price, and company</p>	Medium
	<p>7. Calculate:</p> <ul style="list-style-type: none"> • The number of flights is provided by a company • The number of flight starts on the same day • The number of flights that have the same transit point • The number of flights has the same price • The average price • The number of returned tickets <p>8. Find:</p> <ul style="list-style-type: none"> • The most expensive/ cheapest flight • Companies that provided the most flight • The date that has the most/ least flight • The flight that have below average price 	Low
Accessories	<p>1. View accessories list</p> <p>2. Create an accessory</p> <p>3. Edit an accessory</p> <p>4. Delete an accessory</p>	High
	<p>5. Search accessory by id, type, company, rent date, and return date</p> <p>6. Sort accessories by id, type, company, rent date, and return date</p>	Medium
	<p>7. Calculate:</p> <ul style="list-style-type: none"> • The number of accessories is provided by a company. • The number of accessories rents on the same day • The average price <p>8. Find:</p> <ul style="list-style-type: none"> • The most expensive/ cheapest accessory • Companies that provided the most accessory • The accessories that have below average price 	Low
Voucher	<p>1. View voucher list</p> <p>2. Create a voucher</p> <p>3. Edit a voucher</p> <p>4. Delete a voucher</p>	High
	<p>5. Search voucher by id, expiry date, details, manager and customer</p> <p>6. Sort voucher by id, expiry date, manager and customer</p>	Medium
	<p>7. Calculate:</p> <ul style="list-style-type: none"> • The number of vouchers that is owned by a customer • The number of vouchers that is provided by a manager <p>8. Find:</p> <ul style="list-style-type: none"> • Customers who have the most vouchers • Managers who provide the most vouchers • Vouchers that have the same expiry date 	Low

Booking Bill	1. View booking bill list 2. Create a booking bill 3. Edit a booking bill 4. Delete a booking bill	High
	5. Search booking bill by id, customer, flight, accessory, tour and voucher 6. Sort booking bill by id, customer, flight, accessory, tour and voucher	Medium
	7. Calculate: <ul style="list-style-type: none">• The number of booking bills that is owned by a customer• The total sales value of a booking bill• Sales value by customer 8. Find: <ul style="list-style-type: none">• Customers have most number of booking bills in a year• Booking bills that have the same flight/ tour	Low
Booking Management	a. Full booking details b. Total number of booking bills in a year	Low
Customer Management	a. Active customers: Customers who bought at least 1 item in the last 6 months b. Customer's name & numbers of items in each category that customer bought from	Low
Staff Management	a. Staff of the year (Staff who generated the most sales value, based on their supported customers) b. The oldest/ youngest manager (of each gender) c. The oldest/ youngest staff (of each gender)	Low
Partner Management	a. Name of partner and top selling product by sales value b. Name of partner and top selling product by quantity purchased c. Name of partner who contributes the most commission	Low
Service Management	a. Best sellers regarding quantity, grouped by category b. Best sellers regarding sales value, grouped by category	Low
Sales Management	a. Total Revenue in a year b. Income this year = total commission c. Average sales per year d. The month of the year where recorded highest sales value	Low
OUT SCOPE		
Customers' website navigation tracking.		
Customers' sign up on website and preview of booking history.		

Progress

The following table is our progress in the last 12 weeks, reflecting our plans and milestones of the progress. The red color stands for work on progress, and the green color stands for the milestone where the work was done.

Week	March				April				May			
	1	2	3	4	5	6	7	8	9	10	11	12
Team formation: Everyone	Green	Red	Green									
Proposal:	Red	Red	Green									
- Team meeting for proposing ideas and tasks: all												
- Timeline: An												
- Topic & Scope: Han												
- Communication & Tools & Tech: Tin												
- Risk: Viet												
- People: All												
Research of topic & business: Han			Red	Green								
ERD & Relational Schema: Han					Red	Green						
Database Creation:						Red	Red	Red	Green			
- Database creation: Tin												
- Create data: An												
- Populate data: Tin												
Queries:						Red	Red	Red	Red	Red	Red	Green
- Define scope and business requirements: Han												
- Basic queries: Tin & Viet												
- Advanced queries included in the management dashboard: Han & An												
Application development with APEX:						Red	Red	Red	Red	Red	Red	Green
- UI design: An												
- Report & dashboard: Tin & Viet												
Product-testing & Fixing: Han & An												Green
Report:										Red		Green
- Project background, ERD, relational schema: Han												
- APEX demonstration: An												
- Database creation: Tin & Viet												
- Queries: Han & An												
- Reflection: All												
Presentation:												Green
- Project background & database creation: An												
- Designs of business, ERD & Relational Schema: Han												
- Demonstration of APEX: Tin & Viet												

The team followed the plan quite well at the first half of the project. The team was formed in week 1, the team had a meeting to decide the topic, codes of honor for teamwork, and expectation. We used the TeamGantt website to design a Gantt chart to keep track of our progress. As Han learned about ERD & relational schema design in her Business Information System course, she was able to research and finish the design of ERD early in week 5 to facilitate other teammates in building application. However, the team had problems in using APEX to design the website as this tool is not friendly with our people, and it takes a lot of time to construct the website.

The conflicts between members started in week 8 as miscommunication occurs among the members. The students worked on database creation made adjustments in the tuples and details without immediate notice in the group chat, which caused the others to be annoyed. Moreover, Han and An asked for more for the application design, while Tin and Viet was thinking differently, it takes many

quarrels for the team to actually settle down and reach an agreement. After that, the team went on to complete APEX, video and reports in week 12.

Overall, the team managed to complete the project on time, though there are some unexpected incidents that make the application buildup takes a longer time than expected and activities was delayed. Fortunately, the team was flexible and adjusted the schedule accordingly with the delay.

APPLICATION DESIGN AND IMPLEMENTATION

ERD

The THECRUSADERS database keeps track of the website's customers, staffs, managers, partners, services (flights, tours, accessories), vouchers, and booking bill. The database designer provides full descriptions of the online booking system using conceptual modelling (Figure 2).

Our database construction starts with the core business activities of the company:

- The website contains information of the company's customers. Each has a unique id and a unique account, and a booking history showing their booking on the website. For each customer, there will be a staff who supports their booking.
- The services displayed on the website are provided by the company's partners, who has a unique name, a unique id, and company's managers who manage the partners, approve, and upload the information of the services onto the website.
- The database stores the staffs and managers' names, id, gender, phone number, and address. A staff may support several customers, and it is mandatory to keep track the booking with which a staff support their customers, the services that the managers work with the partners, and the supervisors (who are managers) of the staffs.

Based on these ideas, 11 entities are defined as following:

- An entity type *User* with attributes id, User account, name, gender, DOB, country, type, email, phone number. This entity type is the parent entity of Customer and Admin entities. Both entities have an id as the key attribute. In addition, the Admin has the information about their position in the company and is the parent entity of Staff and Manager.
- An entity type *Partner* with attributes id, name, country, phone, commissions that the Partner pays the company to have their products sold via The Crusaders' website. The id is the key attribute.
- 3 entities which are the services that the company provides its customers, including *Tour*, *Flight*, and *Accessories*. *Tour* entity has id as the key attribute and other attributes including name, price, details, start date and end date. *Flight* entity has id as the key attribute and other attributes including type, price, from (a destination), to (a destination), return (yes or no), depart date, and return date. *Accessories* entity has id as the key attribute and other attributes including detail, price, type, rent date, and return date.
- An entity *Voucher* which is the discount code given to the customers by the managers. The key attribute is id and other attributes including expire date, details, and amount (owned by a customer).

- A booking bill with attributes including time (of booking), booking id, customer id, and total price.

As aforementioned, the Customers and Admin shares the attributes with and are specialized from the parent entity Users; the same patterns apply to Staff, Manager, and their parent entity Admin. The hierarchies between entities are represented by a triangle.

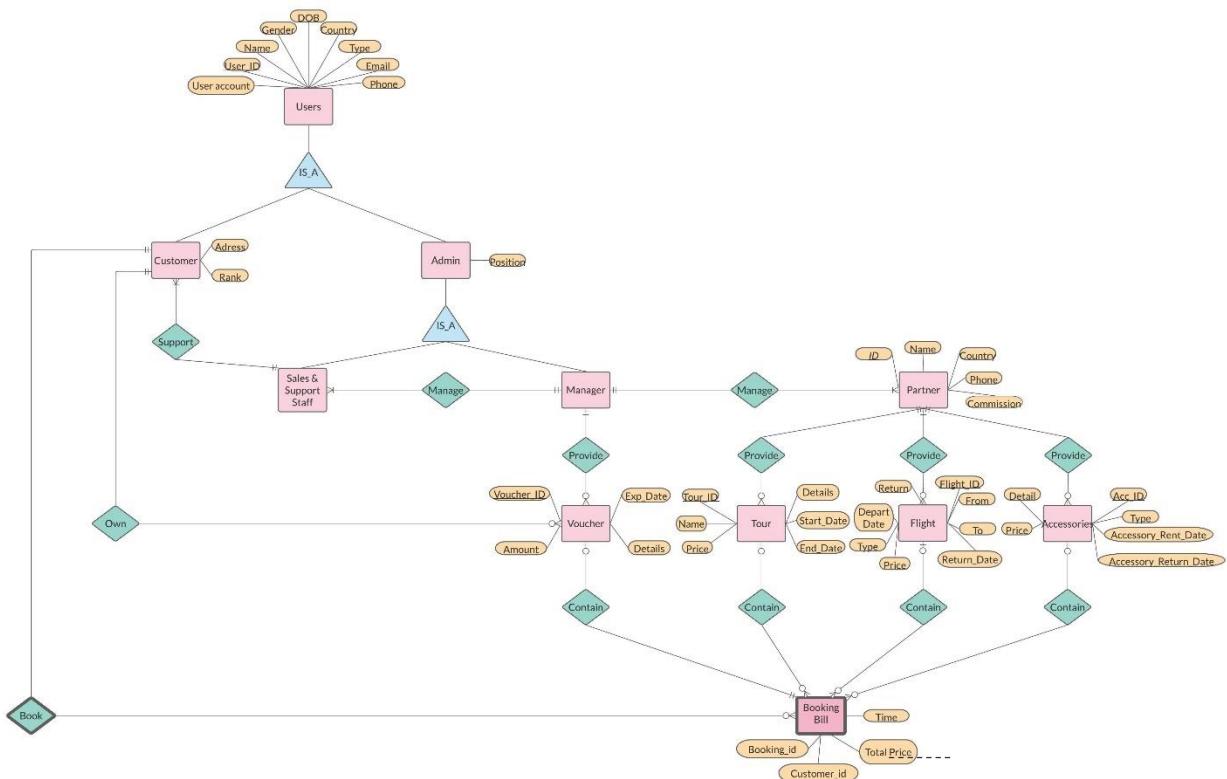


Figure 2. ER Diagram for the THECRUSADERS relational database schema

As Figure 2 demonstrates, the Booking Bill is the weak entity, distinguished by the bold lines surrounding their box and diamond, which is dependent on the Customer entity to be defined and not uniquely identified by itself. Booking Bill is then defined by the weak key Booking_id and the strong key Customer_id, has total participation constraint regarding its identifying relationship.

By adding cardinality ratio and participation constraint of each implicit relationship type, the database is refined as following:

- Support, which is a 1:N (one-to-many) relationship type between Staff and Customer. The customer is only supported by one staff, while a staff can support many customers.
- Manage is a 1:N relationship between Staff and Manager, and between Partner and Manager. The staff is only managed by one manager, while a manager can look after many staffs. Accordingly, a partner is only managed by one manager, while a manager can take care of many partners.
- Provide is a 1:N relationship between Partner and services (tour/flight/accessories), and between manager and voucher. One Partner will provide many types of tour/flight/accessories, while one type of tour/flight/accessories is provided by only one partner. A manager can provide many vouchers, while each voucher is only provided by one manager.

- Own is a 1:N relationship between Customer and voucher. One Customer can own a number of vouchers, while a voucher is assigned to one customer only.
- Contain is a 0:N (zero-to-many) relationship between the services provided and the booking bill, while it is a 0:1 relationship between voucher and booking bill. Many different booking bills can contain zero or more of the services the company provide. Meanwhile, each booking bill will only contain 0 or maximum 1 voucher.
- Book is a 1:N relationship between the customer and the booking bill. Each customer can have many booking bills, and each booking bill can only be placed by only one customer. This is also the identifying relationship for the weak entity type Booking Bill.

Relational Schema

The relational database schema of THECRUSADERS database is shown as Figure 3, with the name at the head of each relation in bold and the attribute names and the domain constraints are shown in the body of relation.

- **User** (User_id: integer, User_Account: varchar, User_Name: varchar, User_Gender: varchar, User_DOB: date, User_Country: varchar, User_Type: varchar, User_Email: varchar, User_Phone: integer): is a relation of degree nine, which stores information about the website's users as a whole.
- **Customers** (Customer_id: integer, Customer_Address: varchar, Customer_Rank: varchar, Customer_Staff: integer) is a relation of degree four, which stores information about website's customers. This table is a result of the hierachies, where it is the specialization of User and all attributes of User are included.
- **Admin** (admin_id: integer, admin_position: varchar) is a relation of degree two, which stores information about the company's employees and their position (staff or manager), which is also the result of the User hierachies. It is seperated from staff table and manager table to maintain the 3rd normalized form.
- **Staff** (staff_id: integer, staff_manager: integer) is a relation of degree two, which stores the id of staff and shows the managers who manages which staffs. This is the result of Admin hierachies.
- **Manager** (manager_id: integer) is a relation seperated from staff table to maintain the 3rd normalized form.
- **Voucher** (Voucher_id: integer, Voucher_exp: date, Voucher_detail: text, Voucher_amount: integer, Voucher_manager: integer, Voucher_customer: integer) is a relation of degree six, which stores the information about the vouchers available for customers, provided by managers.
- **Accessory** (Accessory_id: integer, Accessory_detail: text, Accessory_price: float, Accessory_type: varchar, Accessory_rent_date: date, Accessory_return_date: date, Accessory_Partner: integer) is a relation of degree six, which stores information about the accessory rental available.
- **Partner** (Partner_id: integer, Partner_name: varchar, Partner_country: varchar, Partner_phone: integer, Partner_commissions: float, Partner_Manager: integer) is a relation of degree six, which stores information of company's partners.
- **Tour** (Tour_id: integer, Tour_partner: integer, Tour_name: varchar, Tour_price: float, Tour_details: text, Tour_start_date: time, Tour_end_date: time) is a relation of degree seven, which stores information of the tours provided.

- **Flight** (Flight_id: integer, Flight_type: varchar, Flight_price: float, Flight_from: varchar, Flight_to: varchar, Flight_return: varchar, Flight_partner: integer, Flight_date: date, Flight_return_date: date) is a relation of degree nine, which stores information of the flights.
- **Booking_bill** (Booking_ID: integer, Booking_Voucher: integer, Booking_Customer: integer, Booking_Accessory: integer, Booking_Flight: integer, Booking_tour: integer, Booking_total_price: float, time: datetime) is a relation of degree seven, which stores information about the booking details.

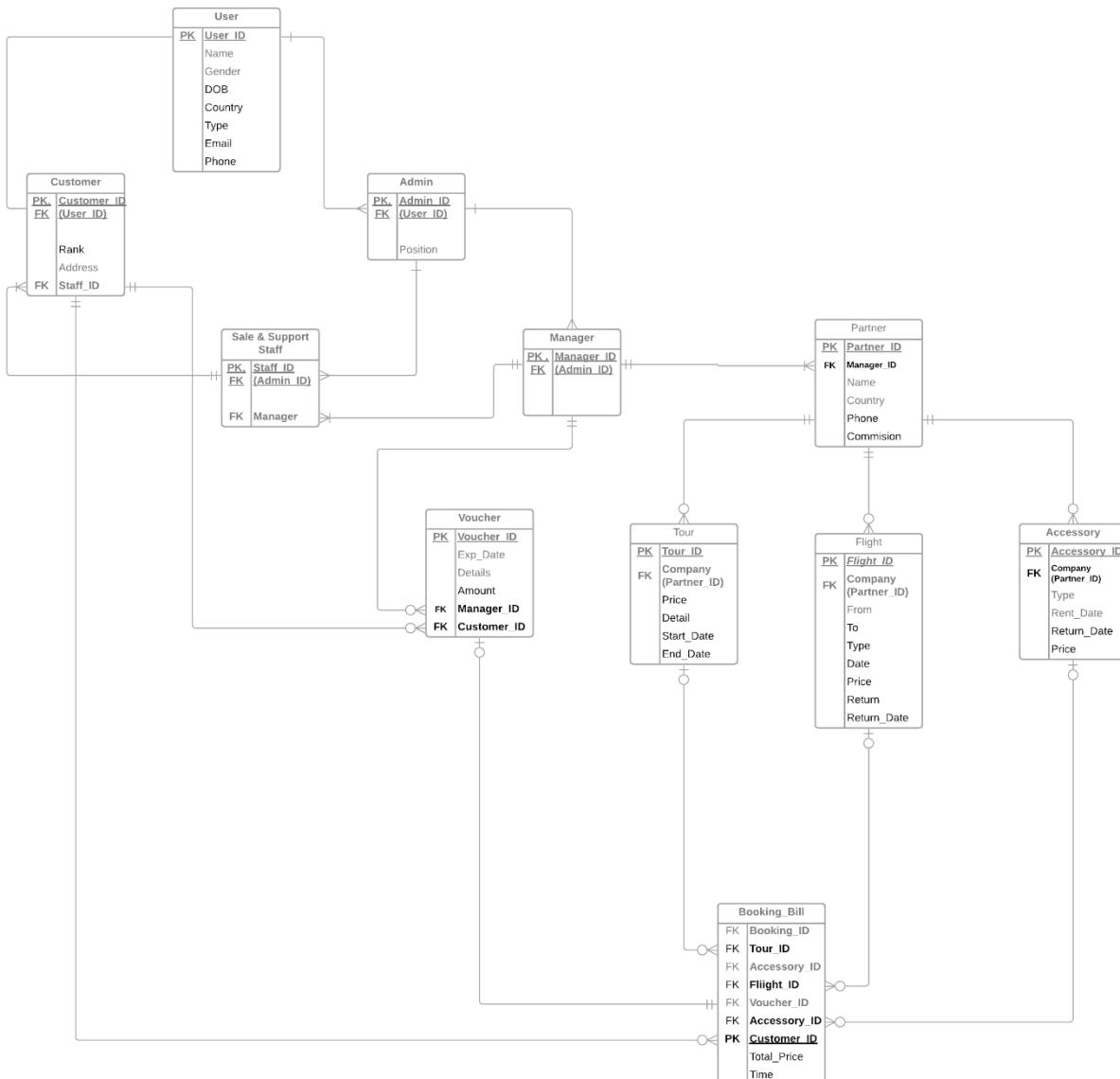


Figure 3. Schema diagram for the THECRUSADERS relational database schema

Database Creation

Firstly, all the old relations and constraints are dropped and cleared before tables in the database are created:

DROP	TABLE	IF	EXISTS	User;
DROP	TABLE	IF	EXISTS	Customer;
DROP	TABLE	IF	EXISTS	Admin;
DROP	TABLE	IF	EXISTS	Manager;
DROP	TABLE	IF	EXISTS	Staff;
DROP	TABLE	IF	EXISTS	Partner;
DROP	TABLE	IF	EXISTS	Voucher;
DROP	TABLE	IF	EXISTS	Tour;

```

DROP TABLE IF EXISTS Booking_Bill;
DROP TABLE IF EXISTS Flight;
DROP TABLE IF EXISTS Accessory;

```

The creation of relations and constraints between the tables are as following:

Relation's name	Constraints	MySQL
Users	Primary key: User_ID Unique Not null: User_Account Not null: User_Name, User_Gender Foreign key: Check: <ul style="list-style-type: none"> Gender: Male or Female Type: Customer or Admin 	<pre> CREATE TABLE User(User_ID INTEGER(10), User_Account VARCHAR(30) UNIQUE NOT NULL , User_Name VARCHAR(30) NOT NULL , User_Gender VARCHAR(10) NOT NULL , User_DOB DATE, User_Country VARCHAR(30), User_Type VARCHAR(15), User_Email VARCHAR(30), User_Phone INTEGER(20), PRIMARY KEY (User_ID), CHECK (User_gender = 'Male' or User_Gender = 'Female'), CHECK (User_Type = 'Customer' or User_Type = 'Admin')); </pre>
Customers	Primary key: Customer_ID Not null: Customer_Rank Check: Rank: Unranked, Bronze, Silver, or Gold Foreign key: Customer_id, Customer_Staff	<pre> CREATE TABLE Customer (Customer_ID INTEGER(10), Customer_Address VARCHAR(50), Customer_Rank VARCHAR(10) NOT NULL, Customer_Staff INTEGER(10), PRIMARY KEY (Customer_ID), CHECK (Customer_Rank = 'Unranked' or Customer_Rank = 'Bronze' or Customer_Rank = 'Silver' or Customer_Rank = 'Gold')); -- ALTER TABLE Customer ADD CONSTRAINT FK_User_Customer FOREIGN KEY (Customer_ID) REFERENCES User(User_ID) ON UPDATE CASCADE ON DELETE CASCADE; -- ALTER TABLE Customer ADD CONSTRAINT FK_Staff_Customer FOREIGN KEY (Customer_Staff) REFERENCES Staff(Staff_ID) ON UPDATE CASCADE ON DELETE CASCADE; </pre>
Sales & Support Staffs	Primary key: Staff_ID Foreign key: Staff_id, Staff_Manager	<pre> CREATE TABLE Staff (Staff_ID INTEGER(10), Staff_Manager INTEGER(10), PRIMARY KEY (Staff_ID)); -- ALTER TABLE Staff ADD CONSTRAINT FK_Admin_Staff FOREIGN KEY (Staff_ID) REFERENCES Admin/Admin_ID) ON UPDATE CASCADE ON DELETE CASCADE; -- ALTER TABLE Staff ADD CONSTRAINT FK_Manager_Staff </pre>

		<pre> FOREIGN KEY (Staff_Manager) Manager(Manager_ID) ON UPDATE CASCADE ON DELETE CASCADE; </pre>
Managers	Primary key: Manager_ID Foreign key: Manager_id	<pre> CREATE TABLE Manager (Manager_ID INTEGER(10), PRIMARY KEY (Manager_ID)); -- ALTER TABLE Manager ADD CONSTRAINT FK_Admin_Manager FOREIGN KEY (Manager_ID) REFERENCES Admin/Admin_ID) ON UPDATE CASCADE ON DELETE CASCADE; --</pre>
Admin	Primary key: Admin_ID Not null: Admin_Position Check: Admin Position: Staff or Manager Foreign key: Admin_id	<pre> CREATE TABLE Admin (Admin_ID INTEGER(10), Admin_Position VARCHAR(30) NOT NULL , PRIMARY KEY (Admin_ID), CHECK (Admin_Position = 'Sales & Support Staff' or Admin_Position = 'Manager')); -- ALTER TABLE Admin ADD CONSTRAINT FK_User_Admin FOREIGN KEY (Admin_ID) REFERENCES User/User_ID) ON UPDATE CASCADE ON DELETE CASCADE; </pre>
Partner	Primary key: Partner_ID Unique Not null: Partner_Name Not null: Partner_Phone, Partner_Commission, Partner_Manager Foreign key: Partner_Manager	<pre> CREATE TABLE Partner (Partner_ID INTEGER(10), Partner_Name VARCHAR(50) UNIQUE NOT NULL , Partner_Country VARCHAR(50), Partner_Phone INTEGER(15) NOT NULL , Partner_Commission FLOAT NOT NULL , Partner_Manager INTEGER(10) NOT NULL , PRIMARY KEY (Partner_ID)); -- ALTER TABLE Partner ADD CONSTRAINT FK_Manager_Partner FOREIGN KEY (Partner_Manager) REFERENCES Manager(Manager_ID) ON UPDATE CASCADE ON DELETE CASCADE; </pre>
Voucher	Primary key: Voucher_ID Not null: Voucher_Exp, Voucher_Detail, Voucher_Manager Foreign key: Voucher_Manager, Voucher_Customer	<pre> CREATE TABLE Voucher (Voucher_ID INTEGER(10), Voucher_Amount INTEGER, Voucher_Exp DATE NOT NULL , Voucher_Detail TEXT NOT NULL , Voucher_Manager INTEGER(10) NOT NULL, Voucher_Customer INTEGER(10), PRIMARY KEY (Voucher_ID)); -- ALTER TABLE Voucher ADD CONSTRAINT FK_Manager_Voucher </pre>

		<pre> FOREIGN KEY (Voucher_Manager) REFERENCES Manager(Manager_ID) ON UPDATE CASCADE ON DELETE CASCADE; -- ALTER TABLE Voucher ADD CONSTRAINT FK_Customer_Voucher FOREIGN KEY (Voucher_Customer) REFERENCES Customer(Customer_ID) ON UPDATE CASCADE ON DELETE CASCADE; </pre>
Tour	Primary key: Tour_ID Not null: Tour_Partner, Tour_Detail, Tour_Start_Date, Tour_End_Date Check: Tour_Price>0 Foreign key: Tour_Partner	<pre> CREATE TABLE Tour (Tour_ID INTEGER(10), Tour_Partner INTEGER(10) NOT NULL, Tour_Price FLOAT NOT NULL , Tour_Detail TEXT NOT NULL , Tour_Start_Date DATE NOT NULL , Tour_End_Date DATE NOT NULL , Tour_Name VARCHAR(30), PRIMARY KEY (Tour_ID), CHECK (Tour_Price > 0)); -- ALTER TABLE Tour ADD CONSTRAINT FK_Partner_Tour FOREIGN KEY (Tour_Partner) REFERENCES Partner(Partner_ID) ON UPDATE CASCADE ON DELETE CASCADE; </pre>
Flight	Primary key: Flight_ID Not null: Flight_Partner, Flight_From, Flight_To, Flight_Return, Flight_Date, Flight_Price, Flight_Type Check: <ul style="list-style-type: none"> • Flight_Price>0 • Flight Return is Yes or No Foreign key: Flight_Partner	<pre> CREATE TABLE Flight (Flight_ID INTEGER(10), Flight_Partner INTEGER(10) NOT NULL, Flight_From VARCHAR(100) NOT NULL , Flight_To VARCHAR(100) NOT NULL , Flight_Return VARCHAR(10) NOT NULL , Flight_Date DATE NOT NULL , Flight_Return_Date DATE, Flight_Price FLOAT NOT NULL , Flight_Type VARCHAR(10) NOT NULL , PRIMARY KEY (Flight_ID), CHECK (Flight_Return = 'Yes' or Flight_Return = 'No'), CHECK (Flight_Type = 'Business' or Flight_Type = 'Economy'), CHECK (Flight_Price > 0)); -- ALTER TABLE Flight ADD CONSTRAINT FK_Partner_Flight FOREIGN KEY (Flight_Partner) REFERENCES Partner(Partner_ID) ON UPDATE CASCADE ON DELETE CASCADE; </pre>
Accessory	Primary key: Flight_ID Not null: Accessory_Partner, Accessory_Detail, Accessory_Return_Date,	<pre> CREATE TABLE Accessory (Accessory_ID INTEGER(10), Accessory_Partner INTEGER(10) NOT NULL , Accessory_Type VARCHAR(20) NOT NULL , Accessory_Detail TEXT NOT NULL , Accessory_Price FLOAT NOT NULL , Accessory_Rent_Date DATE NOT NULL , </pre>

	Accessory_Rent_Date, Accessory_Type Check: Accessory_Price>0 Foreign key: Accessory_Partner	<pre> Accessory_Return_Date DATE NOT NULL , PRIMARY KEY (Accessory_ID), CHECK (Accessory_Return_Date >= Accessory_Rent_Date), CHECK (Accessory_Price > 0)); -- ALTER TABLE Accessory ADD CONSTRAINT FK_Partner_Accessory FOREIGN KEY (Accessory_Partner) REFERENCES Partner(Partner_ID) ON UPDATE CASCADE ON DELETE CASCADE; </pre>
Booking Bill	Primary key: Booking_ID Not null: Booking_Customer, Booking_Total_Price, Time Foreign key: Booking_customer, Booking_Voucher, Booking_Flight, Booking_Accessory	<pre> CREATE TABLE Booking_Bill (Booking_ID INTEGER(10), Booking_Voucher INTEGER(10), Booking_Customer INTEGER(10) NOT NULL, Booking_Accessory INTEGER(10), Booking_Flight INTEGER(10), Booking_Tour INTEGER(10), Booking_Total_Price FLOAT NOT NULL, Time DATETIME NOT NULL, PRIMARY KEY (Booking_ID)); -- ALTER TABLE Booking_Bill ADD CONSTRAINT FK_Customer_Booking FOREIGN KEY (Booking_Customer) REFERENCES Customer(Customer_ID) ON UPDATE CASCADE ON DELETE CASCADE; -- ALTER TABLE Booking_Bill ADD CONSTRAINT FK_Voucher_Booking FOREIGN KEY (Booking_voucher) REFERENCES Voucher(Voucher_ID) ON UPDATE CASCADE ON DELETE SET NULL; -- ALTER TABLE Booking_Bill ADD CONSTRAINT FK_Tour_Booking FOREIGN KEY (Booking_Tour) REFERENCES Tour(Tour_ID) ON UPDATE CASCADE ON DELETE SET NULL; -- ALTER TABLE Booking_Bill ADD CONSTRAINT FK_Flight_Booking FOREIGN KEY (Booking_Flight) REFERENCES Flight(Flight_ID) ON UPDATE CASCADE ON DELETE SET NULL; -- ALTER TABLE Booking_Bill ADD CONSTRAINT FK_Accessory_Booking FOREIGN KEY (Booking_Accessory) REFERENCES Accessory(Accessory_ID) ON UPDATE CASCADE ON DELETE SET NULL; </pre>

Explanations for the attributes and constraints:

- The commission from partners was determined explicitly because the price of their services and the rate on commission can be changed anytime and update every year.

- Booking bill is the weak entity of relation Customer, therefore Booking bill's primary key is also the foreign key referring to the Customer relation with on delete cascade constraints applied.
- Other foreign keys apply on update cascade on delete set null to avoid losing important data and maintain integrity.

The following is the set of statements for populating the data for the relations:

Relation's name	MySQL
Users	<pre> INSERT INTO User (User_ID, User_Name, User_Account, User_Gender, User_DOB, User_Country, User_Type, User_Email, User_Phone) VALUES (5685, 'Edith Walker', 'jacobsrobert', 'Male', '1998-2-15', 'Vietnam', 'CUSTOMER', 'dave35@gmail.com', 678935663), (2613, 'Mary Smith', 'maria52', 'Female', '1982-2-15', 'Tanzania', 'ADMIN', 'achang@gmail.com', 407210005), (2986, 'Anna Williams', 'marcusmurray', 'Female', '1988-2-16', 'Vietnam', 'ADMIN', 'tammy76@yahoo.com', 388631962), (2902, 'Emma Brown', 'chenjoseph', 'Female', '1997-2-17', 'Vietnam', 'ADMIN', 'nhoward@hotmail.com', 394296634), (2381, 'Elizabeth Jones', 'cellison', 'Female', '1998-2-18', 'Vietnam', 'ADMIN', 'juancampos@hotmail.com', 160568037), (2426, 'Minnie Miller', 'vmercado', 'Male', '1992-2-13', 'Vietnam', 'ADMIN', 'vanessa89@gmail.com', 641824209), (2365, 'Margaret Johnson', 'janetsanchez', 'Female', '1998-1-15', 'Vietnam', 'ADMIN', 'corey15@yahoo.com', 263874704), (2188, 'Ida Davis', 'xbeck', 'Male', '1997-2-17', 'Vietnam', 'ADMIN', 'gomezleslie@hotmail.com', 245131612), (5791, 'Alice Garcia', 'walter07', 'Female', '1997-2-14', 'Vietnam', 'ADMIN', 'tammywoods@hotmail.com', 315268949), (5902, 'Bertha Rodriguez', 'pgonzales', 'Male', '1982-1-15', 'Vietnam', 'CUSTOMER', 'bryan80@gmail.com', 422410571), (5293, 'Sarah Wilson', 'hcole', 'Female', '1988-3-13', 'Vietnam', 'CUSTOMER', 'yপাগে@hotmail.com', 869106619), (5697, 'Annie Martinez', 'sayala', 'Female', '1988-2-16', 'Vietnam', 'CUSTOMER', 'dsalazarmaria@yahoo.com', 670912838), (5309, 'Clara Anderson', 'smithpaul', 'Female', '1997-1-17', 'Vietnam', 'CUSTOMER', 'jessicapadilla@gmail.com', 405441009), (5795, 'Ella Taylor', 'lwood', 'Female', '1997-2-19', 'Vietnam', 'CUSTOMER', 'sallywalker@gmail.com', 843138621), (5645, 'Florence Thomas', 'jonesderek', 'Male', '1997-1-20', 'Vietnam', 'CUSTOMER', 'udavis@hotmail.com', 182653931), (5945, 'Cora Hernandez', 'robert91', 'Male', '1998-10-15', 'Vietnam', 'CUSTOMER', 'jrodriguez@yahoo.com', 680642305), (5665, 'Martha Moore', 'balltraci', 'Male', '1992-2-21', 'Vietnam', 'CUSTOMER', 'kelleylisa@hotmail.com', 719278757), (5777, 'Laura Martin', 'hernandeznicole', 'Female', '1993-5-1', 'Vietnam', 'CUSTOMER', 'tamaramorrison@hotmail.com', 139288304), (5176, 'Nellie Jackson', 'mackenzie49', 'Male', '1994-9-22', 'Vietnam', 'CUSTOMER', 'sean96@yahoo.com', 846252868), (5492, 'Grace Thompson', 'monique84', 'Male', '1995-4-23', 'Vietnam', 'CUSTOMER', 'kellylopez@gmail.com', 653910625), (5637, 'Carrie White', 'brownjoe', 'Male', '1996-2-2', 'Vietnam', 'CUSTOMER', 'salazardiane@yahoo.com', 737535861), (5679, 'Maude Lopez', 'wilsonkyle', 'Male', '1997-3-20', 'Vietnam', 'CUSTOMER', 'daviskatherine@gmail.com', 817002860), (5654, 'Mabel Lee', 'imorton', 'Male', '1998-2-2', 'Vietnam', 'CUSTOMER', 'kirbyrachael@hotmail.com', 454799579), </pre>

	(5596, 'Bessie Gonzalez', 'kathleenmurphy', 'Male', '1992-2-1', 'Vietnam', 'CUSTOMER', 'hmassey@yahoo.com', 974706765), (5509, 'Jennie Harris', 'jack88', 'Male', '1992-12-12', 'Vietnam', 'CUSTOMER', 'melissajacobson@hotmail.com', 314324010), (5825, 'Gertrude Clark', 'michael52', 'Male', '1993-11-11', 'Vietnam', 'CUSTOMER', 'criley@yahoo.com', 969022388), (5738, 'Julia Lewis', 'johnsonjohn', 'Male', '1992-1-19', 'Vietnam', 'CUSTOMER', 'christopher91@yahoo.com', 780822056), (5916, 'Hattie Robinson', 'emcclure', 'Male', '1992-3-17', 'Vietnam', 'CUSTOMER', 'megan30@hotmail.com', 332582634), (5508, 'Mattie Perez', 'tacorobert', 'Male', '1992-6-17', 'Vietnam', 'CUSTOMER', 'ronald01@gmail.com', 567100858), (5258, 'Rose Hall', 'dianawilson', 'Male', '1992-2-15', 'Vietnam', 'CUSTOMER', 'brandonberry@hotmail.com', 886993227);
Customer	INSERT INTO Customer (Customer_ID, Customer_Address, Customer_Rank, Customer_Staff) VALUE (5791, '48764 Howard Forge Apt. 421', 'Silver', 2902), (5902, 'Vanessaside, PA 19763', 'Bronze', 2381), (5293, '578 Michael Island', 'Unranked', 2426), (5697, 'New Thomas, NC 34644', 'Unranked', 2365), (5309, '60975 Jessica Squares', 'Unranked', 2188), (5795, 'East Sallybury, FL 71671', 'Unranked', 2902), (5945, '8714 Mann Plaza', 'Unranked', 2381), (5665, 'Lisaside, PA 72227', 'Unranked', 2426), (5777, '96593 White View Apt. 094', 'Unranked', 2365), (5176, 'Jonesberg, FL 05565', 'Unranked', 2188), (5492, '848 Melissa Springs Suite 947', 'Unranked', 2902), (5637, 'Kellerstad, MD 80819', 'Silver', 2381), (5679, '30413 Norton Isle Suite 012', 'Unranked', 2426), (5654, 'North Lisa, ND 79428', 'Gold', 2365), (5596, '39916 Mitchell Crescent', 'Gold', 2188);
Sales & Support Staffs	INSERT INTO Staff (Staff_ID, Staff_Manager) VALUE (2365, 2986), (2188, 2986), (2381, 2986), (2426, 2613), (2902, 2613);
Managers	INSERT INTO Manager (Manager_ID) VALUE (2613), (2986);
Admin	INSERT INTO admin (Admin_ID, Admin_Position) VALUE (2613, 'Manager'), (2381, 'Sales & Support Staff'), (2986, 'Manager'), (2365, 'Sales & Support Staff'), (2902, 'Sales & Support Staff'), (2188, 'Sales & Support Staff'), (2426, 'Sales & Support Staff');
Partner	INSERT INTO Partner (Partner_ID, Partner_Name, Partner_Country, Partner_Phone, Partner_Manager, Partner_Commission) VALUE (6730, 'Chang-Fisher', 'Mongolia', 1227093178, 2613, 2000000), (6230, 'Sheppard-Tucker', 'Luxembourg', 260676096, 2986, 2000000), (6243, 'Oxalis Adventurer', 'Vietnam', 307086589, 2613, 0), (6424, 'Campos PLC', 'Macedonia', 564302429, 2986, 2000000),

	(6735, 'Archer-Patel', 'Guernsey', 734595893, 2613, 2000000), (6117, 'CResponsible Travel', 'Luxembourg', 375441974, 2986, 2000000), (6996, 'AndBeyond', 'Grenada', 989117067, 2613, 2000000), (6311, 'Kynder', 'Anguilla', 713312779, 2986, 3000000), (6819, 'Levy Group', 'Micronesia', 204670670, 2613, 0), (6862, 'Eagle creek', 'Ethiopia', 556282532, 2986, 3000000), (6733, 'Salomon Group', 'Philippines', 990129139, 2613, 3000000), (6715, 'Trekkingnow Inc', 'Malaysia', 631579040, 2986, 23000000), (6885, 'ALKILU LLC', 'Kiribati', 217680762, 2613, 4000000), (6567, 'AquaClan LLC', 'Suriname', 585571357, 2986, 4000000), (6839, 'Earthlove PLC', 'Malaysia', 819323745, 2613, 4000000);
Voucher	INSERT INTO Voucher (Voucher_ID, Voucher_Amount, Voucher_Exp, Voucher_Detail, Voucher_Manager, Voucher_Customer) VALUES (66048763, 1, '2020-6-20', 'Discount 10%', total 'bill', 2613, 5309), (47593824, 2, '2020-7-21', 'Free flight', 2613, 5795), (42194897, 1, '2020-3-2', 'Discount 5%', total 'bill', 2613, 5945), (24115780, 1, '2020-6-20', 'Discount 10%', total 'bill', 2613, 5665), (15659385, 3, '2020-2-1', 'Free flight', 2613, 5777), (77840806, 2, '2020-7-25', 'Discount 5%', total 'bill', 2613, 5176), (16097537, 1, '2020-6-22', 'Discount 10%', total 'bill', 2986, 5492), (51393328, 2, '2020-6-20', 'Free flight', 2986, 5637), (87115871, 3, '2020-1-29', 'Discount 5%', total 'bill', 2986, 5679), (77730806, 2, '2020-2-21', 'Discount 10% total bill', 2986, 5654);
Tour	INSERT INTO Tour (Tour_ID, Tour_Partner, Tour_Price, Tour_Detail, Tour_Start_Date, Tour_End_Date, Tour_Name) VALUES (382, 6730, 4500000, 'Jungle trek and over-night stay in the forest ', '2020-11-11', '2020-11-15', 'Cát Tiên National Park'), (383, 6230, 1050000, 'Boat ride to see Hoa Lu citadel and three famous caves in northern Ninh Binh province (Hang Ca, Hang Hai, Hang Ba) which recognized by UNESCO World Heritage Site', '2020-10-9', '2020-10-12', 'Tam Cốc-Bích Động'), (384, 6243, 69800000, 'Four days exploring with three nights camping in the largest cave in the world with activities like river-swimming, scaling the 90-meter "Great Wall of Vietnam", and discovering other adjacent cave like Hang En', '2021-9-9', '2021-9-12', 'Son Doong Expedition'), (385, 6424, 7200000, 'Trekking and caving adventure through the wildest canaves in the region including Song Oxalis Cave, Tu Lan Cave, Rat Cave, etc.', '2020-10-8', '2020-10-13', 'Wild Tu Lan Explorer'), (386, 6735, 2000000, 'Trekking through the pristine park to see thousand-year-old trees, ancient caves, and lakes lying just 120 km southwest of Hanoi', '2020-10-7', '2020-10-10', 'Cúc Phương National Park'), (387, 6117, 10000000, 'Homestay in Mai Chau to experience the local culture with the mesmerizing natural landscape of rice fields and stilt houses', '2020-10-6', '2020-11-12', 'Mai Châus local tour'), (388, 6996, 15000000, 'Travelling to Ha Giang to see the breathtaking terraces of limestone karsts, rice fields, Ma Pi Leng Pass, and the local villages', '2020-10-5', '2020-11-15', 'Trekking Ha Giang'), (389, 6311, 18000000, 'A chance to experience the ethnic minorities' cultures of Dao, O''Chau, H''Mong, etc. with beautify and cozy homestays', '2020-10-4', '2020-11-13', 'Trekking Sa Pa'), (390, 6819, 30000000, 'Hiking Fansipan - the roof of Indochina with 3,143 meters in height - to see the glorious flower field, abundant rainforests, and bamboo trees.', '2020-11-3', '2020-11-8', 'Fansipan Hiking'), (391, 6996, 25000000, 'Visiting Cao Bang to see Ba Be lake with more than 230 km in length, Ban Gioc waterfall, and Ngom Ngao cave.', '2020-11-11', '2020-11-15', 'Cao Bang Eco-Adventures');

Flight	<pre>INSERT INTO Flight (Flight_ID, Flight_Partner, Flight_From, Flight_To, Flight_Return, Flight_Date, Flight_Return_Date, Flight_Price, Flight_Type) VALUES (271,6839,'Ha Noi','Dong Hoi','Yes','2020-10-1','2020-1-5',2400000,'Economy'), (284,6862,'Ha Noi','Ho Chi Minh','Yes','2021-1-2','2021-1-7',2300000,'Economy'), (285,6733,'Da Nang','Cao Bang','Yes','2022-3-2','2020-3-9',1300000,'Economy'), (299,6862,'Ho Chi Minh','Dong Hoi','Yes','2021-1-10','2021-1-9',1200000,'Economy'), (225,6733,'Da Lat','Ha Noi','No','2020-11-1', null, 2800000,'Business'), (227,6715,'Ho Chi Minh','Ninh Binh','No','2020-9-12',null,3400000,'Business'), (292,6885,'Phu Quoc','Mai Chau','Yes','2020-1-1','2020-1-5',2900000,'Business'), (257,6567,'Cam Ranh','Ha Noi','No','2020-3-12',null,3100000,'Business'), (233,6715,'Da Nang','Dong Hoi','No','2020-3-3', null, 2400000,'Economy'), (252,6885,'Ha Noi','Mai Chau','Yes','2020-9-2','2020-9-12',2400000,'Business');</pre>
Accessory	<pre>INSERT INTO Accessory (Accessory_ID, Accessory_Partner, Accessory_Type, Accessory_Detail, Accessory_Price, Accessory_Rent_Date, Accessory_Return_Date) VALUES (461,6839,'Trekking clothing','Best cloths with versatile layers and soft fabric with synthetic fibers to dry quickly during trail or hike',900000,'2020-10-10','2021-5-2'), (475,6862,'Gloves','Used for rock-climbing with nylon reinforcement and touch-screen compatibility, designed specially for functionality',300000,'2020-6-10','2020-7-12'), (473,6733,'LED filming light','Used to illuminate tent or camp site with solar charger, completely bug and insect free thanks to the absence of UV rays',350000,'2020-6-15','2020-9-12'), (489,6862,'Reusable bag','Used for rock-climbing with nylon reinforcement and touch-screen compatibility, designed specially for functionality',300000,'2019-6-10','2019-6-17'), (443,6733,'Sustainable tent','Made from 100% recycled material and no toxic dyes used, great for over-night jungle sleep',300000,'2020-4-10','2020-8-12'), (447,6715,'Sustainable luggage','Comfortable backpacks and bags with multiple handles for easy grab with minimal-waste material',2000000,'2020-6-11','2021-12-19'), (415,6885,'Sleeping mat','Used for outdoor sleeping',5000000,'2020-5-12','2020-9-12'), (424,6567,'Trekking shoes','Used for rock-climbing with nylon reinforcement and touch-screen compatibility, designed specially for functionality',1500000,'2020-5-20','2020-12-12'), (483,6715,'Water purifier','Best shoes for trekking and ultra or marathon running',6000000,'2020-5-14','2020-10-1'), (441,6885,'Bamboo utensils','Used to eat during camp, could be thrown away at the site to decompose',100000,'2020-2-10','2020-6-1');</pre>
Booking Bill	<pre>INSERT INTO Booking_Bill (Booking_ID, Booking_Voucher, Booking_Customer, Booking_Accessory, Booking_Flight, Booking_Tour, Booking_Total_Price, Time) VALUES (10396,66048763,5309,489,271,382,3050000, '2020-11-11 13:23:44'), (90951,87115871,5679,443,284,383,73340000, '2020-11-09 15:45:21'), (68854,47593824,5795,447,285,384,9000000, '2020-11-11 11:12:01'), (39259,51393328,5637,415,299,385,8000000, '2020-10-29 14:56:59'), (67039,24115780,5665,424,225,386,11123550, '2020-10-29 14:56:59'), (52487,42194897,5945,461,227,387,14747400, '2019-11-12 10:11:01'), (78768,77840806,5176,475,292,388,18350000, '2019-10-19 13:51:49'), (12573,77730806,5654,473,257,389,29260000, '2020-05-19 08:21:33'), (99918,16097537,5492,483,233,390,23670000, '2019-01-05 02:10:03');</pre>

Queries

In this report, different techniques and MySQL functions were employed, including sub-queries and grouping, inner-join and self-join, aggregate, date and time functions, average, like, all or any. The following table is queries set up to run all the reports and data functions for the website:

Features	MySQL
User	
1. Create a User	<pre>INSERT INTO User (User_ID, User_Name, User_Account, User_Gender, User_DOB, User_Country, User_Type, User_Email, User_Phone) VALUE (5685, 'Edith Walker', 'jacobsrobert', 'Male', '1998-2-15', 'Vietnam', 'CUSTOMER', 'dave35@gmail.com', 678935663);</pre>
2. View User List	<pre>SELECT * FROM User;</pre>
3. Edit a user	<pre>UPDATE User SET User_Name = 'Hanah Montana', User_Account = 'Mdnhan0707', User_Gender = 'Female', User_Country = 'Vietnam', User_DOB = '2000-07-07', User_Type = 'Customer', User_Email = 'ngochan07@gmail.com', User_Phone = '901796513' WHERE User_ID = 5685;</pre>
4. Delete an user	<pre>DELETE FROM User WHERE id = 5685;</pre>
5. Search user by id, name, account, country, email, phone	<pre>SELECT * FROM user WHERE User_ID LIKE '%%' AND User_Name LIKE '%E%' AND User_Account LIKE '%%' AND User_Country LIKE '%%' AND User_Email LIKE '%%' AND User_Phone LIKE '%%';</pre>
6. Sort user list id, name, account, country	<pre>SELECT * FROM User ORDER BY User_ID DESC;</pre> <p>Note: Replace order by user_id with user_name, user_account, user_country for different result. And replace DESC with ASC for opposite outcome</p>
7. Calculate: <ul style="list-style-type: none"> - Total user 	<pre>SELECT COUNT(*) as total_user FROM User;</pre>
<ul style="list-style-type: none"> - Number of male/female user 	<pre>SELECT User_Gender, COUNT(*) as total_user FROM User GROUP BY User_Gender ORDER BY total_user ASC;</pre>
<ul style="list-style-type: none"> - Number of user from different country 	<pre>SELECT User_Country, COUNT(*) as total_user FROM User GROUP BY User_Country ORDER BY total_user ASC;</pre>
8. Find: <ul style="list-style-type: none"> - Countries that have the most user 	<pre>SELECT User_Country, total FROM (SELECT User_Country, COUNT(*) as total FROM user GROUP BY User_Country) as country WHERE country.total >= ALL (SELECT COUNT(*) as total FROM user GROUP BY User_Country);</pre>
Customer	
1. Create a Customer	<pre>INSERT INTO Customer (Customer_ID, Customer_Address, Customer_Rank, Customer_Staff) VALUE (5791, '48764 Howard Forge Apt. 421', 'Silver', 2902);</pre>
2. View Customer List	<pre>SELECT * FROM Customer;</pre>
3. Edit a Customer	<pre>UPDATE customer SET Customer_Addree = '112 Le Quang Dinh, District 1', Customer_Rank = 'Gold', Customer_Staff = 2902 WHERE Customer_ID = 5791</pre>

4. Delete customers	DELETE FROM Customer WHERE id = 5791
5. Search customers by id, address, rank, and support staff	<pre>SELECT * FROM Customer WHERE Customer_id LIKE '%%', AND Customer_Address LIKE '%%' AND Customer_Rank LIKE '%Gold%' AND Customer_Staff LIKE '%%'</pre>
6. Sort customers list by id, rank, and support staff	<pre>SELECT * FROM Customer ORDER BY Customer_ID DESC;</pre> <p>Note: Replace order by customer_id with user_rank, customer_staff for different result. And replace DESC with ASC for opposite outcome</p>
7. Calculate - Total Customer	<pre>SELECT COUNT(*) as total_cus FROM Customer;</pre>
- The number of customers that have the same rank	<pre>SELECT Customer_Rank, COUNT(*) as total_cus FROM Customer GROUP BY Customer_Rank;</pre>
8. Find: - Countries that have the most customers	<pre>SELECT User_Country, total FROM (SELECT User_Country, COUNT(*) as total FROM user WHERE User_Type = 'Customer' GROUP BY User_Country) as country WHERE country.total >= ALL (SELECT COUNT(*) as total FROM user WHERE User_Type = 'Customer' GROUP BY User_Country);</pre>
Customers group by age	<pre>SELECT SUM(CASE WHEN (YEAR(CURDATE()) - YEAR(User_DOB)) < 18 THEN 1 ELSE 0 END) AS 'Younger than 18', SUM(CASE WHEN (YEAR(CURDATE()) - YEAR(User_DOB)) >= 18 AND (YEAR(CURDATE()) - YEAR(User_DOB)) < 35 THEN 1 ELSE 0 END) AS 'From 18 to 35', SUM(CASE WHEN (YEAR(CURDATE()) - YEAR(User_DOB)) >= 35 AND (YEAR(CURDATE()) - YEAR(User_DOB)) < 65 THEN 1 ELSE 0 END) AS 'From 35 to 65', SUM(CASE WHEN (YEAR(CURDATE()) - YEAR(User_DOB)) >= 65 THEN 1 ELSE 0 END) AS 'Older than 65' FROM Customer, User WHERE User_ID = Customer_ID;</pre>
Sales & Support Staff	
1. Create a Staff	<pre>INSERT INTO Staff (Staff_ID, Staff_Manager) VALUES (2365, 2986);</pre>
2. View Staff List	<pre>SELECT * FROM Staff;</pre>
3. Edit a Staff	<pre>UPDATE Staff SET Staff_Manager = 2613 WHERE Staff_ID = 2365;</pre>
4. Delete a Staff	<pre>DELETE FROM Staff WHERE Staff_ID = 2365;</pre>
5. Search staffs by id, manager	<pre>SELECT * FROM Staff WHERE Staff_ID LIKE '%2613%' AND Staff_Manager LIKE '%2365%';</pre>
6. Sort staff list by manager	<pre>SELECT * FROM Staff ORDER BY Staff_id DESC;</pre> <p>Note: Replace order by staff_id with staff_manager for different result. And replace DESC with ASC for opposite outcome</p>
7. Calculate: - Total Staffs	<pre>SELECT COUNT(*) as total_staff FROM Staff;</pre>

- Number of staffs managed by a manager	<pre>SELECT Staff_Manager, COUNT(*) as total_staff FROM Staff GROUP BY Staff_Manager ORDER BY Staff_Manager ASC;</pre>
8. Find: • Country that have the most staffs	<pre>SELECT User_Country, total FROM (SELECT User_Country, COUNT(*) as total FROM user WHERE User_Type = 'Sales & Support Staff' GROUP BY User_Country) as country WHERE country.total >= ALL (SELECT COUNT(*) as total FROM user WHERE User_Type = 'Sales & Support Staff' GROUP BY User_Country);</pre>
Manager	
1. Create a Manager	INSERT INTO Manager (Manager_ID) VALUE (2613);
2. View Manager List	SELECT * FROM Manager;
3. Delete a Manager	DELETE FROM Manager WHERE id = 2613;
4. Search manager by id	<pre>SELECT * FROM Manager WHERE Manager_ID LIKE '%2%'</pre>
5. Sort manager list by id	<pre>SELECT * FROM Manager ORDER BY Manager_ID DESC;</pre>
6. Calculate: • Total Manager	<pre>SELECT COUNT(*) as total_manager FROM Manager</pre>
Partner	
1. Create a Partner	<pre>INSERT INTO Partner (Partner_ID, Partner_Name, Partner_Country, Partner_Phone, Partner_Manager, Partner_Commission) VALUE (6730, 'Chang-Fisher', 'Mongolia', 1227093178, 2613, 2000000);</pre>
2. View Partner List	SELECT * FROM Partner;
3. Edit a Partner	<pre>UPDATE Partner SET Partner_Name = 'Qatas Airway', Partner_Country = 'Australia', Partner_Commission = 4000000 WHERE Partner_ID = 6730;</pre>
4. Delete a Partner	DELETE FROM Partner WHERE Partner_ID = 6730;
5. Search partner by id, name, country, and manager	<pre>SELECT * FROM Partner WHERE Partner_ID LIKE '%%' AND Partner_Name LIKE '%Q%' AND Partner_Country LIKE '%%' AND Partner_Manager LIKE '%%';</pre>
6. Sort partner by id, name, country, commission	<pre>SELECT * FROM Partner ORDER BY Partner_ID DESC;</pre> <p>Note: Replace order by partner_id with partner_country, partner_name, partner_commission for different result. And replace DESC with ASC for opposite outcome</p>
7. Calculate: - Number of partners from a country	<pre>SELECT Partner_Country, COUNT(*) as total_partner FROM Partner GROUP BY Partner_Country ORDER BY total_partner ASC;</pre>
- Number of partners managed by a manager	<pre>SELECT Partner_Manager, COUNT(*) as total_partner FROM Partner GROUP BY Partner_Manager ORDER BY total_partner ASC;</pre>

Tour	
Create a Tour	<pre>INSERT INTO Tour (Tour_ID, Tour_Partner, Tour_Price, Tour_Detail, Tour_Start_Date, Tour_End_Date, Tour_Name) VALUE (382, 6730, 4500000, 'Jungle trek and over-night stay in the forest', '2020-11-11', '2020-11-15', 'Cat Tien National Park');</pre>
View tour List	<pre>SELECT * FROM Tour;</pre>
Edit a tour	<pre>UPDATE Tour SET Tour_Price = 500000 Tour_Start_Date = '2020-07-20' Tour_End_Date = '2020-08-11' Tour_Name = 'Ha Noi Trip' WHERE Tour_ID = 382;</pre>
Delete a tour	<pre>DELETE FROM Tour WHERE Tour_ID = 382</pre>
Search tour by id, start date, end date, and company	<pre>SELECT * FROM Tour WHERE Tour_ID LIKE '%%' AND Tour_Start_Date LIKE '%%' AND Tour_End_Date LIKE '%%' AND Tour_Partner LIKE '%S%';</pre>
Sort tour by id, start date, end date, company, and price	<pre>SELECT * FROM Tour ORDER BY Tour_ID DESC;</pre> <p>Note: Replace order by tour_id with tour_start_date, tour_end_date, tour_partner, tour_price for different result. And replace DESC with ASC for opposite outcome</p>
Find: • The most expensive/ cheapest tour	<p>The Most Expensive:</p> <pre>SELECT Tour_Name, Tour_Price FROM Tour WHERE Tour_Price >= ALL (SELECT Tour_Price FROM Tour);</pre> <p>The Cheapest:</p> <pre>SELECT Tour_Name, Tour_Price FROM Tour WHERE Tour_Price <= ALL (SELECT Tour_Price FROM Tour);</pre>
• Companies that provided the most tour	<pre>SELECT Tour_Partner, Partner_Name, total FROM Partner, (SELECT Tour_Partner, COUNT(*) as total FROM Tour GROUP BY Tour_Partner) as partner WHERE Tour_Partner = Partner_ID AND partner.total >= ALL (SELECT COUNT(*) as total FROM Tour GROUP BY Tour_Partner);</pre>
• The tours that have below average price	<pre>SELECT Tour_Name, Tour_Price FROM Tour WHERE Tour_Price <= (SELECT AVG(Tour_Price) FROM Tour);</pre>
Flight	
Create a flight	<pre>INSERT INTO Flight (Flight_ID, Flight_Partner, Flight_From, Flight_To, Flight_Return, Flight_Date, Flight_Return_Date, Flight_Price, Flight_Type) VALUE (271, 6839, 'Ha Noi', 'Dong Hoi', 'Yes', '2020-10-01', '2020-11-15', 2400000, 'Economy');</pre>
View flight list	<pre>SELECT * FROM Flight;</pre>

Edit a flight	<pre> Update Flight SET Flight_From = 'Ha Noi' Flight_To = 'Ho Chi Minh' Flight_Date = '2021-01-01' WHERE Flight_ID = 271 </pre>
Delete flight	<pre>DELETE FROM Flight WHERE Flight_ID = 271</pre>
Search fight by id, location (from and to), date, price, and company	<pre> SELECT * FROM Flight WHERE Flight_ID LIKE '%%' AND Flight_From LIKE '%H%' AND Flight_To LIKE '%H%' AND Flight_Date LIKE '%%' AND Flight_Return_Date LIKE '%%' AND Flight_Partner LIKE '%%'; </pre>
Sort flight by id, location (from and to), transit point, date, price, and company	<pre> SELECT * FROM Flight ORDER BY Tour_ID DESC; Note: Replace order by flight_id with _country, flight_date, flight_return_date, flight_partner, flight_price for different result. And replace DESC with ASC for opposite outcome </pre>
Find: <ul style="list-style-type: none"> The most expensive/ cheapest flight 	<p>The Most Expensive</p> <pre> SELECT Flight_Name, Flight_Price FROM Flight WHERE Flight_Price >= ALL (SELECT Flight_Price FROM Flight); </pre> <p>The Cheapest:</p> <pre> SELECT Flight_Name, Flight_Price FROM Flight WHERE Flight_Price >= ALL (SELECT Flight_Price FROM Flight); </pre>
<ul style="list-style-type: none"> Companies that provided the most flight 	<pre> SELECT Flight_Partner, Partner_Name, total FROM Partner, (SELECT Flight_Partner, COUNT(*) as total FROM Flight GROUP BY Flight_Partner) as partner WHERE Flight_Partner = Partner_ID AND partner.total >= ALL (SELECT COUNT(*) as total FROM Flight GROUP BY Flight_Partner); </pre>
<ul style="list-style-type: none"> The flights that have below average price 	<pre> SELECT Flight_Name, Flight_Price FROM Flight WHERE Flight_Price <= (SELECT AVG(Flight_Price) FROM Flight); </pre>
Accessories	
View accessories list	<pre>SELECT * FROM Accessory;</pre>
Create an accessory	<pre> INSERT INTO Accessory (Accessory_ID, Accessory_Partner, Accessory_Type, Accessory_Detail, Accessory_Price, Accessory_Rent_Date, Accessory_Return_Date) VALUE (461, 6839, 'Trekking clothing', 'Best cloths with versatile layers and soft fabric with synthetic fibers to dry quickly during trail or hike', 900000, '2021-05-02'); </pre>
Edit an accessory	<pre> UPDATE Accessory SET Accessory_Price = 500000 Accessory_Rent_Date = '2020-07-20' Accessory_Return_Date = '2020-08-11' Accessory_Type = 'Gloves' </pre>

	WHERE Accessory_ID = 461;
Delete an accessory	DELETE FROM Accessory WHERE Accessory_ID = 271
Search accessory by id, type, company, rent date, and return date	<pre>SELECT * FROM Accessory WHERE Accessory_ID LIKE '%%' AND Accessory_Type LIKE '%C% AND Accessory_Rent_Date LIKE '%%' AND Accessory_Return_Date LIKE '%%' AND Accessory_Partner LIKE '%%';</pre>
Sort accessories by id, type, company, rent date, and return date	<pre>SELECT * FROM Accessory ORDER BY Accessory_ID DESC;</pre> <p>Note: Replace order by Accessory_id with Accessory_rent_date, Accessory_return_date, Accessory_partner, Accessory_price for different result. And replace DESC with ASC for opposite outcome</p>
Find: • The most expensive/ cheapest accessory	<p>The Most Expensive:</p> <pre>SELECT Accessory_Name, Accessory_Price FROM Accessory WHERE Accessory_Price >= ALL (SELECT Accessory_Price FROM Accessory);</pre> <p>The Cheapest:</p> <pre>SELECT Accessory_Name, Accessory_Price FROM Accessory WHERE Accessory_Price <= ALL (SELECT Accessory_Price FROM Accessory);</pre>
• Companies that provided the most accessory	<pre>SELECT Accessory_Partner, Partner_Name, total FROM Partner, (SELECT Accessory_Partner, COUNT(*) as total FROM Accessory GROUP BY Accessory_Partner) as partner WHERE Accessory_Partner = Partner_ID AND partner.total >= ALL (SELECT COUNT(*) as total FROM Accessory GROUP BY Accessory_Partner);</pre>
• The accessories that have below average price	<pre>SELECT Accessory_Name, Accessory_Price FROM Accessory WHERE Accessory_Price <= (SELECT AVG(Accessory_Price) FROM Accessory);</pre>
Voucher	
View voucher list	SELECT * FROM Voucher;
Create a voucher	<pre>INSERT INTO Voucher (Voucher_ID, Voucher_Amount, Voucher_Exp, Voucher_Detail, Voucher_Manager, Voucher_Customer) VALUE (66048763, 1, '2020-06-20', 'Discount 10% total bill', 2613, 5309);</pre>
Edit a voucher	<pre>UPDATE Voucher SET Tour_Amount = 5 Tour_Exp = '2021-09-20' WHERE Tour_ID = 66048763;</pre>
Delete a voucher	<pre>DELETE FROM voucher WHERE voucher_ID = 66048763</pre>
Search voucher by id, expiry date, details, manager and customer	<pre>SELECT * FROM Voucher WHERE Voucher_ID LIKE '%%' AND Voucher_Exp LIKE '%2021-09-20%' AND Voucher_Amount LIKE '%%';</pre>

Sort voucher by id, expiry date, manager and customer	<pre>SELECT * FROM Voucher ORDER BY Voucher_ID DESC; Note: Replace order by Voucher_id with Voucher_Exp, Voucher_Amount, Voucher_Details, Voucher_Manager, Voucher_Customer for different result. And replace DESC with ASC for opposite outcome</pre>
Find: Customers who have the most vouchers	<pre>SELECT User_Name, total FROM User U, (SELECT Voucher_Customer, SUM(V1.Voucher_Amount) as total FROM Voucher V1 GROUP BY Voucher_Customer) as voucher WHERE Voucher_Customer = User_ID AND voucher.total >= ALL (SELECT SUM(V2.Voucher_Amount) as total FROM Voucher V2 GROUP BY Voucher_Customer);</pre>
Managers who provide the most vouchers	<pre>SELECT User_Name, total FROM User U, (SELECT Voucher_Manager, SUM(V1.Voucher_Amount) as total FROM Voucher V1 GROUP BY Voucher_Manager) as voucher WHERE Voucher_Manager = User_ID AND voucher.total >= ALL (SELECT SUM(V2.Voucher_Amount) as total FROM Voucher V2 GROUP BY Voucher_Manager);</pre>
Booking Bill	
View booking bill list	<pre>SELECT * FROM Booking_Bill;</pre>
Create a booking bill	<pre>INSERT INTO Booking_Bill (Booking_ID, Booking_Voucher, Booking_Customer, Booking_Accessory, Booking_Flight, Booking_Tour, Booking_Total_Price, Time) VALUES (10396, 66048763, 5309, 498, 271, 382, 3050000, '2020-11-11 13:23:44');</pre>
Edit a booking bill	<pre>UPDATE Booking_Bill SET Booking_Total_Price = 1500000 Booking_Flight = null Booking_Tour = null WHERE Booking_ID = 10396;</pre>
Delete a booking bill	<pre>DELETE FROM Booking_Bill WHERE Booking_ID = 10396</pre>
Search booking bill by id, customer, flight, accessory, tour and voucher	<pre>SELECT * FROM Tour WHERE Booking_ID LIKE '%' AND Booking_Flight LIKE '%' AND Booking_Tour LIKE '%' AND Booking_Accessory LIKE '%4%';</pre>
Sort booking bill by id, customer, flight, accessory, tour and voucher	<pre>SELECT * FROM Booking_Bill ORDER BY Booking_ID DESC; Note: Replace order by Booking_id with Booking_customer, Booking_flight, Booking_tour, Booking_accessory for different result. And replace DESC with ASC for opposite outcome</pre>
Find: <ul style="list-style-type: none">Customers have most number of booking bills in a year	<pre>SELECT U.User_Name, total FROM User U, (SELECT B1.Booking_Customer, COUNT(*) as total FROM Booking_Bill B1 WHERE YEAR(B1.Time) = '2020' GROUP BY Booking_Customer) as booking WHERE U.User_ID = Booking_Customer AND booking.total >= ALL (SELECT COUNT(*) as total FROM Booking_Bill B2 WHERE YEAR(B2.Time) = '2020' GROUP BY Booking_Customer);</pre>

Booking Management	
a. Full booking details	<pre> SELECT U.User_Name, V.Voucher_Detail, A.Accessory_Type, A.Accessory_Rent_Date, A.Accessory_Return_Date, F.Flight_From, F.Flight_To, F.Flight_Return, F.Flight_Date, F.Flight_Return_Date, F.Flight_Type, T.Tour_Name, T.Tour_Detail, T.Tour_Start_Date, T.Tour_End_Date, B.Booking_Total_Price FROM Booking_Bill B INNER JOIN User U ON B.Booking_Customer = U.User_ID INNER JOIN Voucher V ON B.Booking_Voucher = V.Voucher_ID INNER JOIN Accessory A ON B.Booking_Accessory = A.Accessory_ID INNER JOIN Flight F ON B.Booking_Flight = F.Flight_ID INNER JOIN Tour T ON B.Booking_Tour = T.Tour_ID; </pre>
b. Total number of booking bills in a year	<pre> SELECT COUNT(*) as total_booking_bill FROM Booking_Bill WHERE Time BETWEEN '2020-01-01' AND '2020-12-31'; </pre>
Customer Management	
a. Active customers: Customers who bought at least 1 item in the last 6 months	<pre> SELECT DISTINCT U.User_Name FROM Booking_Bill B, User U WHERE B.Time BETWEEN (SELECT DATE_ADD(CURRENT_DATE, INTERVAL -6 MONTH)) AND (SELECT CURRENT_DATE) AND Booking_Customer = User_ID; </pre>
b. Customer's name & numbers of items in each category that customer bought from	<pre> SELECT U.User_Name, COUNT(IF(B.Booking_Flight <> NULL, Booking_Flight, 0)) as total_flight, COUNT(IF(B.Booking_Tour <> NULL, Booking_Tour, 0)) as total_tour, COUNT(IF(B.Booking_Accessory <> NULL, Booking_Accessory, 0)) as total_accessory FROM Booking_Bill B, User U WHERE U.User_ID = B.Booking_Customer GROUP BY U.User_Name; </pre>
Staff Management	
a. The oldest/ youngest manager	<pre> -- Oldest Manager: SELECT User_Name, (YEAR(CURRENT_DATE) - YEAR(User_DOB)) as User_Age FROM User, Manager WHERE User_ID = Manager_ID AND (YEAR(CURRENT_DATE) - YEAR(User_DOB)) >= ALL (SELECT (YEAR(CURRENT_DATE) - YEAR(User_DOB)) FROM User, Manager WHERE User_ID = Manager_ID) -- Youngest Manager: SELECT User_Name, (YEAR(CURRENT_DATE) - YEAR(User_DOB)) as User_Age FROM User, Manager WHERE User_ID = Manager_ID AND (YEAR(CURRENT_DATE) - YEAR(User_DOB)) <= ALL (SELECT (YEAR(CURRENT_DATE) - YEAR(User_DOB)) FROM User, Manager WHERE User_ID = Manager_ID) </pre>

```

-- Oldest Staff:

SELECT User_Name, (YEAR(CURRENT_DATE) - YEAR(User_DOB)) as User_Age
FROM User, Staff
WHERE User_ID = Staff_ID
AND (YEAR(CURRENT_DATE) - YEAR(User_DOB)) >= ALL (
    SELECT (YEAR(CURRENT_DATE) - YEAR(User_DOB))
    FROM User, Staff
    WHERE User_ID = Staff_ID)

-- Youngest Staff:

SELECT User_Name, (YEAR(CURRENT_DATE) - YEAR(User_DOB)) as User_Age
FROM User, Staff
WHERE User_ID = Staff_ID
AND (YEAR(CURRENT_DATE) - YEAR(User_DOB)) <= ALL (
    SELECT (YEAR(CURRENT_DATE) - YEAR(User_DOB))
    FROM User, Staff
    WHERE User_ID = Staff_ID)

```

b. The oldest/ youngest staff

Partner management

Find: • A manager who manages the most partner	<pre> SELECT DISTINCT U.User_Name FROM User U, Partner P WHERE U.User_ID = (SELECT DISTINCT Partner_Manager FROM (SELECT Partner_Manager, COUNT(*) as total FROM Partner GROUP BY Partner_Manager) as manager WHERE manager.total >= ALL (SELECT COUNT(*) as total FROM Partner GROUP BY Partner_manager)); </pre>
• Countries that have the most partner	<pre> SELECT Partner_Country, total FROM (SELECT Partner_Country, COUNT(*) as total_part FROM Partner GROUP BY Partner_Country) as country WHERE country.total >= ALL (SELECT COUNT(*) as total FROM Partner GROUP BY Partner_Country); </pre>

Service Management

a. Best sellers regarding quantity, grouped by category	<p>Flight:</p> <pre> SELECT F.Flight_ID, F.Flight_From, F.Flight_To, total FROM Flight F, (SELECT B1.Booking_Flight, COUNT(*) as total FROM Booking_Bill B1 GROUP BY Booking_Flight) as booking WHERE F.Flight_ID = Booking_Flight AND booking.total >= ALL (SELECT COUNT(*) as total FROM Booking_Bill B2 GROUP BY B2.Booking_Flight); </pre> <p>Tour:</p> <pre> SELECT T.Tour_ID, T.Tour_Name, T.Tour_Detail, total FROM Tour T, (SELECT B1.Booking_Tour, COUNT(*) as total FROM Booking_Bill B1 GROUP BY Booking_Tour) as booking WHERE T.Tour_ID = Booking_Tour AND booking.total >= ALL (SELECT COUNT(*) as total FROM Booking_Bill B2 GROUP BY B2.Booking_Tour); </pre>
---	---

Accessory:

```
SELECT A. Accessory_ID, A. Accessory_Type, A.  
Accessory_Detail, total  
FROM Accessory A, (SELECT B1.Booking_Accessory, COUNT(*) as  
total  
FROM Booking_Bill B1  
GROUP BY Booking_Accessory) as booking  
WHERE A. Accessory_ID = Booking_Accessory  
AND booking.total >= ALL (SELECT COUNT(*) as total  
FROM Booking_Bill B2  
GROUP BY B2.Booking_Accessory);
```

Sales Management

a. Total Revenue in a year	SELECT SUM(Booking_Total_Price) + SUM(Partner_Commission) as total_revenue FROM Booking_Bill, Partner WHERE YEAR(Time) = '2020';
b. Income this year = total commission	SELECT SUM(Partner_Commission) as total_income FROM Partner;

Application Features

Application link:

<https://apex.oracle.com/pls/apex/rmit/r/the-crusaders4357054734/login?session=25730034253882>

Customer:

User name: Customer

Password: 1234

Staff:

User name: Staff

Password: 1234

Manager:

User name: Manager

Password: 1234

Based on the ERD, there are 3 user types for our application, which are customer, staffs and manager. Therefore, we have customized the login page such that it can authorize a user given his account. For this project, we have created 3 users corresponding to the 3 account types. The figure below shows the login page.

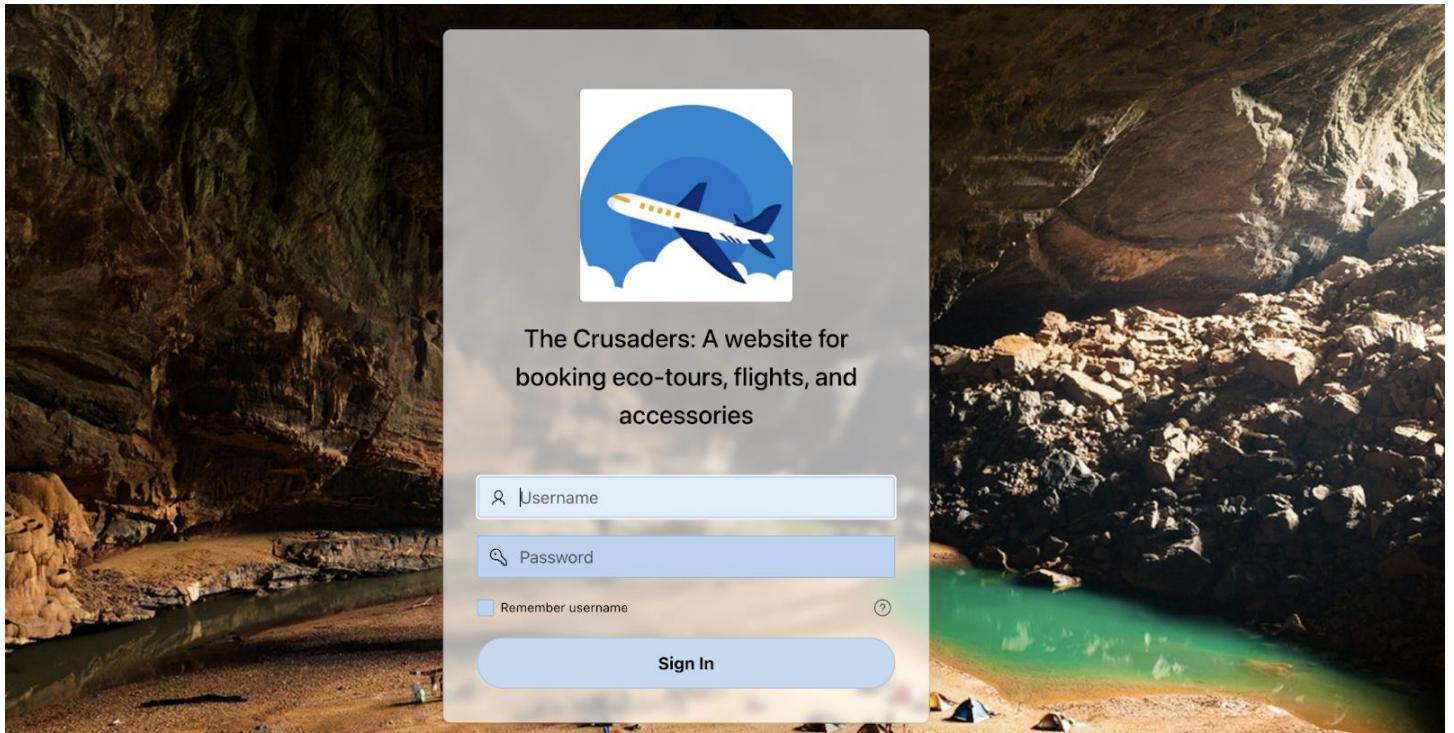


Figure 1. Login Page

Depending on the account, a user will be directed to a different home page

User Type	Home page interface/Dashboard
Manager	

Figure 2. Home page of manager

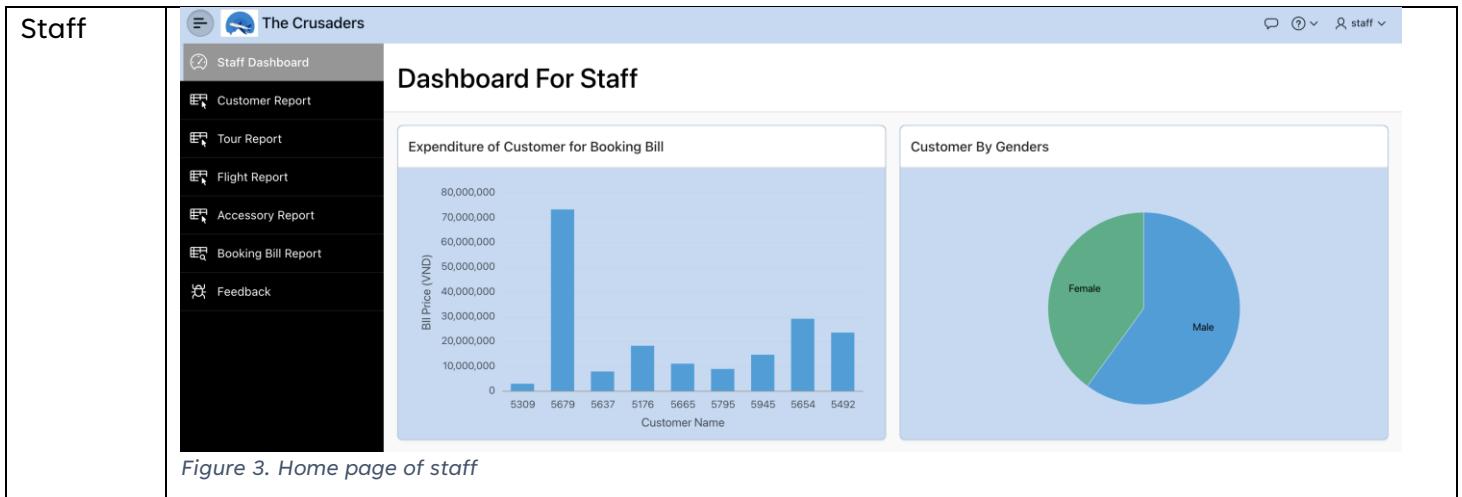


Figure 3. Home page of staff

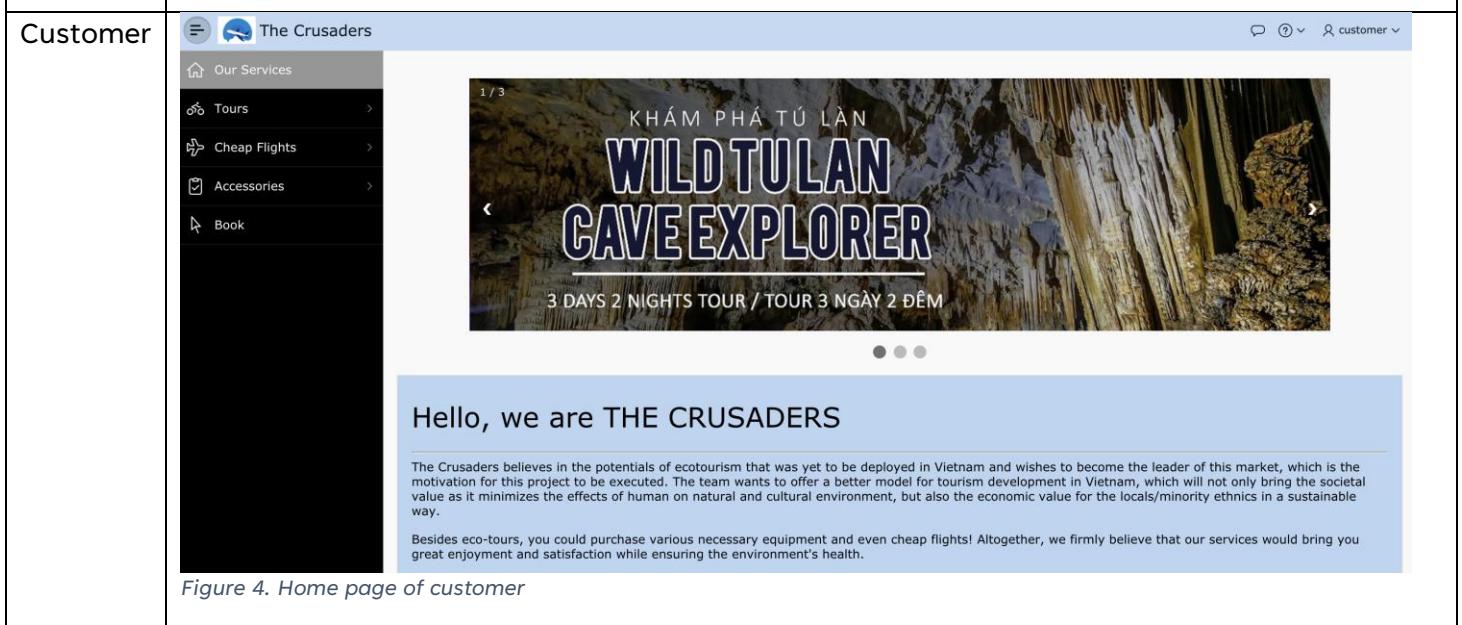


Figure 4. Home page of customer

On the left-hand side, there is a navigation bar that assists the user in going from one page to another. For the customer page, we decided that it is best to capture the interest of them first coming to the page. Therefore, we included a slider images with a very informative introduction of ourselves in the latter box. For the manager and the staff, a dashboard would sum up most of the information they need, hence needed to be put first.

We have created usernames and passwords for all three accounts as summarized below:

UNAME	PWD	STATUS
customer	1234	CUSTOMER
staff	1234	STAFF
manager	1234	MANAGER

Figure 5. user password

Note that the UNAME column stores 3 usernames for 3 account types, while the PWD column stores the password corresponding to the username of the same row. For simplicity, the passwords for all users are 1234. For example, to login as a customer, the username is customer and the password is 1234.

1. Customer

a. Cheap Flights:

Cheap Flights

The screenshot shows a search interface for cheap flights. On the left, there are dropdown menus for 'Flight From' and 'Flight To', each listing various cities with counts. A search bar at the top has 'Search...' and 'Go' buttons. The main area displays a table titled 'Flight Details' with columns for Flight From, Flight To, Flight Return, Flight Date, Flight Return Date, Flight Price, Flight Type, and Partner Name. The table contains 10 rows of flight information. At the bottom right of the table is the text '1 - 10'.

Flight Details							
Flight From ↑	Flight To	Flight Return	Flight Date	Flight Return Date	Flight Price	Flight Type	Partner Name
Cam Ranh	Ha Noi	No	3/12/2020		3100000	Business	Vietjet Air
Da Lat	Ha Noi	No	11/1/2020		2800000	Business	Bamboo Airlines
Da Nang	Cao Bang	Yes	3/2/2020	3/9/2020	1300000	Economy	Vietnam Airlines
Da Nang	Dong Hoi	No	3/3/2020		2400000	Economy	Vietjet Air
Ha Noi	Mai Chau	Yes	9/2/2020	9/12/2020	2400000	Business	Bamboo Airlines
Ha Noi	Ho Chi Minh	Yes	1/2/2021	1/7/2021	2300000	Economy	Pacific Airlines
Ha Noi	Dong Hoi	Yes	10/1/2020	1/5/2020	2400000	Economy	Vietjet Air
Ho Chi Minh	Ninh Binh	No	9/12/2020		3400000	Business	Pacific Airlines
Ho Chi Minh	Dong Hoi	Yes	1/10/2021	1/9/2021	1200000	Economy	Vietnam Airlines
Phu Quoc	Mai Chau	Yes	1/1/2020	1/5/2020	2900000	Business	Bamboo Airlines

Figure 6. Search Flight for Customer Page

- Function of this page (query):

The customers can use this page to search all available flights that they can book. Since we do not sell all the for all the tours but just the cheap tickets for customers wanting to buy tickets from us, the name is Cheap Flight.

- Feature & Interaction:

- Search: The customer can type in the keyword that he wants to search for in the search flight table. For example, to find the flight which departure is "Da Lat" (Figure below):

The screenshot shows the search results for 'Da Lat'. The search bar at the top contains 'Da Lat' and a 'Go' button. The main area displays a table titled 'Flight Details' with columns for Flight From, Flight To, Flight Return, Flight Date, Flight Return Date, Flight Price, Flight Type, and Partner Name. The table contains 1 row of flight information. At the bottom right of the table is the text '1 - 1'.

Flight Details							
Flight From ↑	Flight To	Flight Return	Flight Date	Flight Return Date	Flight Price	Flight Type	Partner Name
Da Lat	Ha Noi	No	11/1/2020		2800000	Business	Bamboo Airlines

Figure 7. Search "Da Lat" Key Word.

- Apply Checkbox Filter: The customer can select categorical data that he wants to search for. For example, to find the flight which destination is “Ha Noi” (Figure bellow):

Cheap Flights

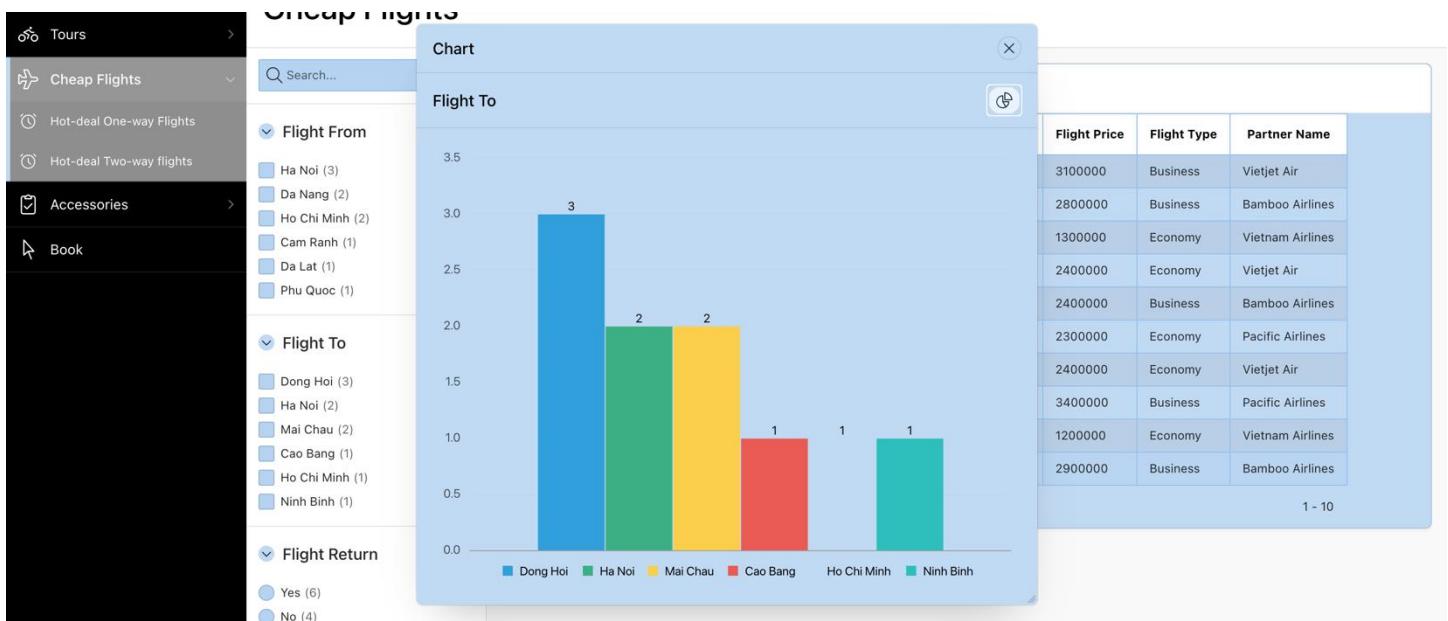
The screenshot shows a flight search interface with the following details:

- Flight From:** Options include Cam Ranh (1) and Da Lat (1).
- Flight To:** Options include Dong Hoi (3), Ha Noi (2), Mai Chau (2). The checkbox for Ha Noi is checked.
- Flight Details Table:**

Flight From	Flight To	Flight Return	Flight Date	Flight Return Date	Flight Price	Flight Type	Partner Name
Cam Ranh	Ha Noi	No	3/12/2020		3100000	Business	Vietjet Air
Da Lat	Ha Noi	No	11/1/2020		2800000	Business	Bamboo Airlines
- Count:** 1 - 2 flights found.

Figure 8. Apply tick filter to find all flight which destination is “Dong Hoi”.

- Show chart: The customer can observe the bar chart or pie chart to visualize the quantity of each category. For example, the customer can view the column chart and pie chart which illustrate the destination of the flights.



Figure

9.

chart

illustrate

data

- Sort by column: The customer can sort the data in an ascending or descending order by clicking to corresponding column that they choose. For example, the customer can sort the flights in an ascending order of the Flight Destination (Figure bellow):

Cheap Flights

The screenshot shows a search interface for flight tickets. On the left, there are two dropdown menus: "Flight From" and "Flight To", each with a list of cities and their counts. The "Flight From" menu includes Ha Noi (3), Da Nang (2), Ho Chi Minh (2), Cam Ranh (1), Da Lat (1), and Phu Quoc (1). The "Flight To" menu includes Dong Hoi (3), Ha Noi (2), Mai Chau (2), Cao Bang (1), Ho Chi Minh (1), and Ninh Binh (1). In the center, a table titled "Flight Details" lists 10 flight records with columns for Flight From, Flight To, Flight Return, Flight Date, Flight Return Date, Flight Price, Flight Type, and Partner Name. The table shows flights from Phu Quoc to Mai Chau, Ho Chi Minh to Ninh Binh, etc., with prices ranging from 1,200,000 to 3,400,000. At the bottom right of the table, it says "1 - 10".

Flight From ↓	Flight To	Flight Return	Flight Date	Flight Return Date	Flight Price	Flight Type	Partner Name
Phu Quoc	Mai Chau	Yes	1/1/2020	1/5/2020	2900000	Business	Bamboo Airlines
Ho Chi Minh	Ninh Binh	No	9/12/2020		3400000	Business	Pacific Airlines
Ho Chi Minh	Dong Hoi	Yes	1/10/2021	1/9/2021	1200000	Economy	Vietnam Airlines
Ha Noi	Ho Chi Minh	Yes	1/2/2021	1/7/2021	2300000	Economy	Pacific Airlines
Ha Noi	Dong Hoi	Yes	10/1/2020	1/5/2020	2400000	Economy	Vietjet Air
Ha Noi	Mai Chau	Yes	9/2/2020	9/12/2020	2400000	Business	Bamboo Airlines
Da Nang	Cao Bang	Yes	3/2/2020	3/9/2020	1300000	Economy	Vietnam Airlines
Da Nang	Dong Hoi	No	3/3/2020		2400000	Economy	Vietjet Air
Da Lat	Ha Noi	No	11/1/2020		2800000	Business	Bamboo Airlines
Cam Ranh	Ha Noi	No	3/12/2020		3100000	Business	Vietjet Air

Figure 10. Searching flight ticket list in customer page

b. Hot-deal (one-way) For Customer:

The screenshot shows a navigation menu on the left with options like "Our Services", "Tours", "Cheap Flights", "Hot-deal One-way Flights" (which is selected and highlighted in grey), "Hot-deal Two-way flights", "Accessories", and "Book". The main content area is titled "Hot-deal One-way Flights" and shows a search bar with "Actions" and a table of one-way flight deals. The table has columns for Flight From, Flight To, Flight Date, Flight Price, Flight Type, Flight Return Date, and Flight Return. It lists two flights: one from Da Lat to Ha Noi on 11/1/2020 at 2,800,000 VND (Business class, No return) and another from Da Nang to Dong Hoi on 3/3/2020 at 2,400,000 VND (Economy class, No return). At the bottom right of the table, it says "1 - 2".

Flight From	Flight To	Flight Date	Flight Price	Flight Type	Flight Return Date	Flight Return
Da Lat	Ha Noi	11/1/2020	2800000	Business		No
Da Nang	Dong Hoi	3/3/2020	2400000	Economy		No

Figure 11. Hot-deal one-way flights for customer

- Function of this page (query):

The customers can use this page to search all cheap flights (one-way or no return flights) which have the price below the average flight price.

- Features & Interaction (These Features are the same to the “Search Tour For Customer” page which are presented in section above so we will not list examples of these features again):

- Search: The customer can type in the keyword that he wants to search for in the recommended one-way flight table.

- Applied query:

- This query is applied a sub query to find the average price from the flight table then select the flights that have below average price where flight_return = ‘No’.

```
CREATE VIEW Hot_deal_one_way_flight AS
SELECT
    FLIGHT_FROM,
```

```

FLIGHT_TO,
FLIGHT_RETURN,
FLIGHT_DATE,
FLIGHT_RETURN_DATE,
FLIGHT_PRICE,
FLIGHT_TYPE,
FLIGHT_PARTNER

FROM
    FLIGHT, PARTNER
WHERE FLIGHT_PARTNER = PARTNER_ID AND FLIGHT_PRICE < (SELECT AVG(FLIGHT_PRICE) FROM FLIGHT WHERE FLIGHT_RETURN = 'No') AND FLIGHT_RETURN = 'No';

```

c. Hot-deal Flight (two-way) Customer:

Flight From	Flight To	Flight Date	Flight Price	Flight Type	Flight Return Date	Flight Return
Ho Chi Minh	Dong Hoi	1/10/2021	1200000	Economy	1/9/2021	Yes
Da Nang	Cao Bang	3/2/2020	1300000	Economy	3/9/2020	Yes

Figure 12. Hot-deal two-way flight for customer

- Function of this page (query):

The customers can use this page to search all flights which have the price below the average flight price.

- Features & Interaction (These Features are the same to the “Search Tour For Customer” page which are presented in section above so we will not list examples of these features again):

- Search: The customer can type in the keyword that he wants to search for in the recommended two-way flight table.

- Applied query:

This query is applied a sub query to find the average price from the flight table then select the flights that have below average price where flight_return = ‘Yes’.

```

CREATE VIEW Hot_deal_two_way_flight AS
SELECT
    FLIGHT_FROM,
    FLIGHT_TO,
    FLIGHT_RETURN,
    FLIGHT_DATE,
    FLIGHT_RETURN_DATE,
    FLIGHT_PRICE,
    FLIGHT_TYPE,
    FLIGHT_PARTNER

FROM
    FLIGHT, PARTNER

```

```
WHERE FLIGHT_PARTNER = PARTNER_ID AND FLIGHT_PRICE < (SELECT AVG(FLIGHT_PRICE) FROM FLIGHT WHERE FLIGHT_RETURN = 'Yes') AND FLIGHT_RETURN = 'Yes';
```

The screenshot shows the 'Accessories' section of a travel website. The sidebar on the left includes links for 'Our Services', 'Tours', 'Cheap Flights', 'Accessories' (which is currently selected), and 'Hot-deal Accessories'. Below these are sections for 'Book' and 'Customer'. The main content area has a search bar with placeholder 'Search...' and a 'Go' button. Under 'Accessory Partner', there are links to ALKILU LLC (2), Eagle creek (2), Salomon Group (2), Trekkingnow Inc (2), Aguacan LLC (1), and Earthlove PLC (1). Under 'Accessory Type', there are links to Bamboo utensils (1), Gloves (1), LED filming light (1), and Portable bag (1). The main table has columns for Accessory Id, Accessory Type, Accessory Detail, Accessory Price, Accessory Rent Date, Accessory Return Date, and Partner Name. The data in the table is as follows:

Accessory Id	Accessory Type	Accessory Detail	Accessory Price	Accessory Rent Date	Accessory Return Date	Partner Name
415	Sleeping mat	Used for outdoor sleeping	5000000	5/12/2020	9/12/2020	ALKILU LLC
424	Trekking shoes	Used for rock-climbing with nylon reinforcement and touch-screen compatibility, designed specially for functionality	1500000	5/20/2020	12/12/2020	AquaClan LLC
441	Bamboo utensils	Used to eat during camp, could be thrown away at the site to decompose	100000	2/10/2020	6/1/2020	ALKILU LLC
443	Sustainable tent	Made from 100% recycled material and no toxic dyes used, great for over-night jungle sleep	300000	4/10/2020	8/12/2020	Salomon Group
447	Sustainable luggage	Comfortable backpacks and bags with multiple handles for easy grab with minimal-waste material	2000000	6/11/2020	12/19/2020	Trekkingnow Inc
461	Trekking clothing	Best cloths with versatile layers and soft fabric with synthetic fibers to dry quickly during trail or hike	900000	10/10/2020	5/2/2021	Earthlove PLC
		Used to illuminate tent or camp site with solar charger.				

d. Accessories:

Figure 13. Accessories

- Function of this page (query):

The customers can use this page to search all available accessories that they can book.

- Features & Interaction (These Features are the same to the “Search Tour For Customer” page which are presented in section above so we will not list examples of these features again):
 - Search: The customer can type in the keyword that he wants to search for in the accessory table.
 - Apply Checkbox Filter: The customer can select the accessory type that he wants to search for in the accessory search table.
 - Show chart: The customer can observe the bar chart or pie chart to visualize the quantity of each accessory type.
 - Sort by column: The customer can sort accessory id

e. Tours:

The screenshot shows a navigation sidebar on the left with links: Our Services, Tours, Hot-deal Tours, Cheap Flights, Accessories, and Book. The 'Tours' link is highlighted. The main content area has a title 'Tours' and a search bar with placeholder 'Search...'. Below is a table titled 'Tour Details' with columns: Tour Name, Tour Price, Tour Detail, Tour Start Date, Tour End Date, and Partner Name. The data in the table is as follows:

Tour Name	Tour Price	Tour Detail	Tour Start Date	Tour End Date	Partner Name
Cao Bang Eco-Adventures	2500000	Visiting Cao Bang to see Ba Be lake with more than 230 km in length, Ban Gioc waterfall, and Ngom Ngao cave.	11/11/2020	11/15/2020	AndBeyond
Cát Tiên National Park	4500000	Jungle trek and over-night stay in the forest	11/11/2020	11/15/2020	Chang-Fisher
Cúc Phương National Park	2000000	Trekking through the pristine park to see thousand-year-old trees, ancient caves, and lakes lying just 120 km southwest of Hanoi	10/7/2020	10/10/2020	Archer-Patel
Fansipan Hiking	3000000	Hiking Fansipan - the roof of Indochina with 3,143 meters in height - to see the glorious flower field, abundant rainforests, and bamboo trees.	11/3/2020	11/8/2020	Levy Group
Mai Châus local tour	1000000	Homestay in Mai Chau to experience the local culture with the mesmerizing natural landscape of rice fields and stilt houses	10/6/2020	11/12/2020	CResponsible Travel

Figure 14: Tours

- Function of this page (query):

The customers can use this page to search all available tours that they can book.

- Features & Interaction (These Features are the same to the “Search Tour For Customer” page which are presented in section above so we will not list examples of these features again):
 - Search: The customer can type in the keyword that he wants to search for in the tour table.
 - Sort by column: The customer can sort tour name in an ascending or descending order by clicking to corresponding column that they choose.

i. Making a Booking:

The screenshot shows a navigation sidebar on the left with links: Our Services, Tours, Cheap Flights, Accessories, and Book. The 'Book' link is highlighted. The main content area has a title 'Make a Booking' and a form titled 'Make a Booking'. It includes a 'Customer Name' input field with 'Be' typed in, showing suggestions: Bertha Rodriguez, Bessie Gonzalez, and Mabel Lee. There are also sections for 'Accessory Type' and 'Voucher Detail'.

Figure 15. Make a new booking

Auto complete: the customer does not need to type in his full name, as the system will automatically suggest all possible customer's names, matching with the input characters, which are retrieved from the database. In the example, when the customer enters “be”, the system suggests 3 names consisting of “be”, which are “Bertha Rodriguez”, “Bessie Gonzalez” and “Mabel Lee”.

The screenshot shows a user interface for booking a flight. On the left, there's a sidebar with navigation links: 'Cheap Flights', 'Accessories', and 'Book'. The main area is titled 'Make a Booking' and contains a form with fields for 'Customer Name' (set to 'Be') and 'Flight Type'. Below this is a dropdown menu containing a table with flight information:

Flight Type	Flight From	Flight To	Flight Return	Flight Date	Flight Return Date	Flight Price	Partner Name
Business	Phu Quoc	Mai Chau	Yes	1/1/2020	1/5/2020	2900000	Bamboo Airlines
Business	Da Lat	Ha Noi	No	11/1/2020	-	2800000	Bamboo Airlines
Business	Ha Noi	Mai Chau	Yes	9/2/2020	9/12/2020	2400000	Bamboo Airlines
Economy	Ha Noi	Ho Chi Minh	Yes	1/2/2021	1/7/2021	2300000	Pacific Airlines

Figure 16. auto select in booking bill feature

Drop down lookup table: for selecting the flight the system will provide a drop-down list of possible flights that the customer can select. Hence, there is no need for the customer to remember which flight that he wants to book in the booking form. The same feature will be applied to selecting accessory and tour.

j. Customer Feedback:

The screenshot shows a user interface for booking a tour. The sidebar includes links for 'Our Services', 'Tours', 'Cheap Flights', 'Accessories', and 'Book'. The main area is titled 'Make a Booking' and contains a form with fields for 'Customer Name' (set to 'Be'), 'Flight Type', 'Accessory Type', 'Voucher Detail', and 'Tour Name'. A 'Feedback' dialog box is open over the form, containing a rating section with three smiley faces (green, orange, red) and a text input field for 'Feedback'. At the bottom of the dialog are 'Cancel' and 'Submit Feedback' buttons.

Figure 17. Customer feedback feature

Give feedback: the customer can send a feedback and rate our service from the feedback form shown above. The feedback and rating then can be seen by the staff in the feedback page.

2. Staff:

a. Tour Report:

The screenshot shows a staff dashboard with a sidebar containing links like Staff Dashboard, Customer Report, Tour Report (selected), Flight Report, Accessory Report, Booking Bill Report, and Feedback. The main area is titled 'Report Tour For Staff' and contains a table with the following data:

	Tour Name	Tour Price	Tour Detail	Tour Start Date	Tour End Date	Tour Id	Partner Name
<input checked="" type="checkbox"/>	Tam Cốc-Bích Động	1050000	Boat ride to see Hoa L...	10/9/2020	10/12/2020	383	Sheppard-Tucker
<input type="checkbox"/>	Trekking Ha Giang	15000000	Travelling to Ha Giang...	10/5/2020	11/15/2020	388	AndBeyond
<input type="checkbox"/>	Trekking Sa Pa	18000000	A chance to experienc...	10/4/2020	11/13/2020	389	Kynder
<input type="checkbox"/>	Cao Bang Eco-Advent...	25000000	Visiting Cao Bang to s...	11/11/2020	11/15/2020	391	AndBeyond
<input type="checkbox"/>	Wild Tu Lan Explorer	7200000	Trekking and caving a...	10/8/2020	10/13/2020	385	Campos PLC
<input type="checkbox"/>	Mai Châus local tour	10000000	Homestay in Mai Chau...	10/6/2020	11/12/2020	387	CResponsible Travel
<input type="checkbox"/>	Cát Tiên National Park	4500000	Jungle trek and over...	11/11/2020	11/15/2020	382	Chang-Fisher
<input type="checkbox"/>	Son Doong Expedition	69800000	Four days exploring w...	9/9/2021	9/12/2021	384	Oxalis Adventurer
<input type="checkbox"/>	Fansipan Hiking	30000000	Hiking Fansipan - the ...	11/3/2020	11/8/2020	390	Levy Group
<input type="checkbox"/>	Cúc Phương National ...	2000000	Trekking through the ...	10/7/2020	10/10/2020	386	Archer-Patel

1 rows selected Total 10

Figure 18. Report tours for staff

- Function of this page (query):

The staff can use this page to search, edit or delete tour-related records.

- Features & Interaction:

- Search by typing: The staff can type in the keyword that he wants to search in the tour table.
- Search by drop down: the staff can choose a specific column to search for necessary information in the dropdown list.

The screenshot shows the same staff dashboard and report page as Figure 18. The dropdown menu for selecting a search column is open over the 'Tour Name' header, showing options like 'Tour Name ↓', 'Tour Price', 'Tour Detail', 'Tour Start Date', 'Tour End Date', 'Tour Id', and 'Partner Name'. The rest of the table and sidebar are identical to Figure 18.

Figure 19. choosing key in column to search in report

- Edit: The staff can use the Edit button to make change to the data of each tour.
- Add new row or new data: The staff can use the Add Row button to add a new tour.
- Applied query:
The query applied is the same to the query that used in “Customer” section above.

b. Flight Report:



The screenshot shows a navigation sidebar on the left with links: Staff Dashboard, Customer Report, Tour Report, Flight Report (which is selected and highlighted in blue), Accessory Report, Booking Bill Report, and Feedback. The main content area is titled "Report Flight For Staff". It features a search bar with "Search: All Text Columns" and "Go" button, along with "Actions", "Edit", "Save", and "Add Row" buttons. A "Reset" button is also present. Below the search bar is a table with the following columns: Flight From, Flight To, Flight Return, Flight Date, Flight Return Date, Flight Price, Flight Type, and Partner Name. The table contains 10 rows of flight data. At the bottom of the table, it says "1 rows selected" and "Total 10".

		Flight From	Flight To	Flight Return	Flight Date	Flight Return Date	Flight Price	Flight Type	Partner Name
<input checked="" type="checkbox"/>	<input type="checkbox"/>	Phu Quoc	Mai Chau	Yes	1/1/2020	1/5/2020	2900000	Business	Bamboo Airlines
<input type="checkbox"/>	<input type="checkbox"/>	Da Lat	Ha Noi	No	11/1/2020		2800000	Business	Bamboo Airlines
<input type="checkbox"/>	<input type="checkbox"/>	Ha Noi	Mai Chau	Yes	9/2/2020	9/12/2020	2400000	Business	Bamboo Airlines
<input type="checkbox"/>	<input type="checkbox"/>	Ha Noi	Ho Chi Minh	Yes	1/2/2021	1/7/2021	2300000	Economy	Pacific Airlines
<input type="checkbox"/>	<input type="checkbox"/>	Ho Chi Minh	Ninh Binh	No	9/12/2020		3400000	Business	Pacific Airlines
<input type="checkbox"/>	<input type="checkbox"/>	Ha Noi	Dong Hoi	Yes	10/1/2020	1/5/2020	2400000	Economy	Vietjet Air
<input type="checkbox"/>	<input type="checkbox"/>	Da Nang	Dong Hoi	No	3/3/2020		2400000	Economy	Vietjet Air
<input type="checkbox"/>	<input type="checkbox"/>	Cam Ranh	Ha Noi	No	3/12/2020		3100000	Business	Vietjet Air
<input type="checkbox"/>	<input type="checkbox"/>	Ho Chi Minh	Dong Hoi	Yes	1/10/2021	1/9/2021	1200000	Economy	Vietnam Airlines
<input type="checkbox"/>	<input type="checkbox"/>	Da Nang	Cao Bang	Yes	3/2/2020	3/9/2020	1300000	Economy	Vietnam Airlines

Figure 20. Flight Report

- Function of this page (query): The staff can use this page to search, edit or delete flight-related records.
- Features & Interaction (These Features are the same to the “Tour” page which are presented in section above so we will not list examples of these features again):
 - Search by typing: The staff can type in the keyword that he wants to search for in the flight table.
 - Search by drop down: the staff can choose a specific column to search for (departure, destination, flight return status, flight date, return date, flight price, flight type and flight partner) in the dropdown list.
 - Edit: The staff can use the edit option to edit the data of each flight.
 - Add new row or new data: The staff can use the Add Row function to add a new flight.
- Applied query:
The query applied is the same to the query that used in “Customer” section above.

c. Report Accessory:

The screenshot shows a sidebar with navigation links: Staff Dashboard, Customer Report, Tour Report, Flight Report, Accessory Report (which is selected), Booking Bill Report, and Feedback. The main content area is titled 'Report Accessory For Staff'. It features a search bar with dropdowns for 'Search: All Text Columns', 'Go', 'Actions', 'Edit', 'Save', and 'Add Row', along with a 'Reset' button. A table displays accessory data with columns: Accessory Type, Accessory Detail, Accessory Price, Accessory Rent Date, Accessory Return Date, and Partner Name. The data includes items like Trekking shoes, Water purifier, LED filming light, Reusable bag, Sustainable luggage, Bamboo utensils, Gloves, Sustainable tent, Trekking clothing, and Sleeping mat, with details such as price (e.g., 1500000, 6000000) and partner names (e.g., Aguacan LLC, Trekkingnow Inc). At the bottom, it says '1 rows selected' and 'Total 10'.

	Accessory Type	Accessory Detail	Accessory Price	Accessory Rent Date	Accessory Return Date	Partner Name
<input checked="" type="checkbox"/>	Trekking shoes	Used for rock-climbing wit...	1500000	5/20/2020	12/12/2020	Aguacan LLC
<input type="checkbox"/>	Water purifier	Best shoes for trekking an...	6000000	5/14/2020	10/1/2020	Trekkingnow Inc
<input type="checkbox"/>	LED filming light	Used to illuminate tent or ...	350000	6/15/2020	12/9/2020	Salomon Group
<input type="checkbox"/>	Reusable bag	Used for rock-climbing wit...	300000	6/10/2020	6/17/2020	Eagle creek
<input type="checkbox"/>	Sustainable luggage	Comfortable backpacks an...	2000000	6/11/2020	12/19/2020	Trekkingnow Inc
<input type="checkbox"/>	Bamboo utensils	Used to eat during camp, ...	100000	2/10/2020	6/1/2020	ALKILU LLC
<input type="checkbox"/>	Gloves	Used for rock-climbing wit...	300000	10/6/2020	12/7/2020	Eagle creek
<input type="checkbox"/>	Sustainable tent	Made from 100% recycled ...	300000	4/10/2020	8/12/2020	Salomon Group
<input type="checkbox"/>	Trekking clothing	Best cloths with versatile I...	900000	10/10/2020	5/2/2021	Earthlove PLC
<input type="checkbox"/>	Sleeping mat	Used for outdoor sleeping	5000000	5/12/2020	9/12/2020	ALKILU LLC

Figure 21. Report Accessory

- Function of this page (query):

The staff can use this page to search, edit or delete accessory-related records.

- Features & Interaction (These Features are the same to the “Tour” page which are presented in section above so we will not list examples of these features again):

- Search by typing: The staff can type in the keyword that he wants to search in the accessory table.
- Search by drop down: the staff can choose a specific column to search for (accessory type, price, partner, rent- and return-date) in the dropdown list.
- Edit: The staff can edit the data of each record in the accessory table as a spreadsheet.
- Add new row or new data: The staff can use the Add Row button to add a new accessory.

- Applied query:

The query applied is the same to the query that is used in “Customer” section above.

d. Report Customer for Staff:

The screenshot shows a sidebar with navigation links: Staff Dashboard, Customer Report, Tour Report, Flight Report, Accessory Report (which is selected), Booking Bill Report, and Feedback. The main content area is titled 'Report Customer for Staff'. It features a search bar with dropdowns for 'Search: All Text Columns', 'Go', 'Actions', 'Edit', 'Save', and 'Add Row', along with a 'Reset' button. A table displays customer data with columns: Customer Name, Customer Acc, Customer Gen, Customer Dob, Customer Add, Customer Cou, Customer Ema, Customer Pho, Staff of Custo, Customer Id, and Customer Rank. The data includes customers like Clara Ander..., Bessie Gonz..., Nellie Jacks..., Cora Herna..., Bertha Rodr..., Carrie White, Alice Garcia, and Ella Taylor, with details such as rank (e.g., Unranked, Gold, Bronze, Silver) and contact information.

	Customer Name	Customer Acc	Customer Gen	Customer Dob	Customer Add	Customer Cou	Customer Ema	Customer Pho	Staff of Custo	Customer Id	Customer Rank
<input checked="" type="checkbox"/>	Clara Ander...	smithpaul	Female	1/17/1997	60975 Jessi...	Vietnam	jessicapadill...	405441009	Ida Davis	5309	Unranked
<input type="checkbox"/>	Bessie Gonz...	kathleenmurr...	Male	2/1/1992	39916 Mitc...	Vietnam	hmassey@y...	974706765	Ida Davis	5596	Gold
<input type="checkbox"/>	Nellie Jacks...	mackenzie49	Male	9/22/1994	Jonesberg, ...	Vietnam	sean96@ya...	846252868	Ida Davis	5176	Unranked
<input type="checkbox"/>	Cora Herna...	robert91	Male	10/15/1998	8714 Mann ...	Vietnam	jrodriguez@...	680642305	Elizabeth Jo...	5945	Unranked
<input type="checkbox"/>	Bertha Rodr...	pgonzales	Male	1/15/1982	Vanessasid...	Vietnam	bryan80@g...	422410571	Elizabeth Jo...	5902	Bronze
<input type="checkbox"/>	Carrie White	brownjoe	Male	2/2/1966	Kellerstad, ...	Vietnam	salazardian...	737535861	Elizabeth Jo...	5637	Silver
<input type="checkbox"/>	Alice Garcia	walter07	Female	2/14/1997	48764 How...	Vietnam	tammywood...	315268949	Emma Brown	5791	Silver
<input type="checkbox"/>	Ella Taylor	lwood	Female	2/19/1997	East Sallybu...	Vietnam	sallywalker...	843138621	Emma Brown	5795	Unranked

Figure 22. Report Customer for Staff

- Function of this page (query):

The staff can use this page to search, edit or delete customer-related records.

- Features & Interaction (These Features are the same to the “Report Tour For Staff” page which are presented in section above so we will not list examples of these features again):
 - Search by typing: The staff can type the keyword that he wants to search for in the customer table.
 - Search by drop down: the staff can choose a specific column to search for (customer name, gender, date of birth, address, country, phone, email and the supporting staff) in the dropdown list.
 - Edit: The staff can edit the data of each record in the customer table as a spreadsheet
 - Add new row or new data: The staff can use the Add Row button to add a new customer.

e. Search Booking For Staff:

Booking Id	Booking Total Price	Booking Voucher	Booking Customer	Booking Accessory	Booking Flight	Booking Tour	Booking Date
10396	3050000	66048763	5309	489	271	382	11/11/2020
90951	73340000	87115871	5679	443	284	383	11/9/2020
39259	8000000	51393328	5637	415	299	385	10/29/2020
78768	18350000	77840806	5176	475	292	388	10/19/2019
67039	11123550	24115780	5665	424	225	386	10/29/2020
68854	9000000	47593824	5795	447	285	384	11/11/2020
52487	14747400	42194897	5945	461	227	387	11/3/2019
12573	29260000	77730806	5654	473	257	389	5/19/2020
99918	23670000	16097537	5492	483	233	390	1/5/2020

Figure 23. Search booking for staff

- Function of this page (query):

The staff can use this page to search (only) all information of booking bill history from all customers.

- Features & Interaction (These Features are the same to the “Report Tour For Staff” page which are presented in section above so we will not list examples of these features again):
 - Search by typing: The staff can type the keyword that he wants to search for in the booking bill history table.
 - Search by drop down: the staff can choose a specific column to search for (booking id, customer name, tour name, tour start- and end- date, tour price, flight price, accessory price and total booking bill price) in the dropdown list.

f. Customer Feedback:

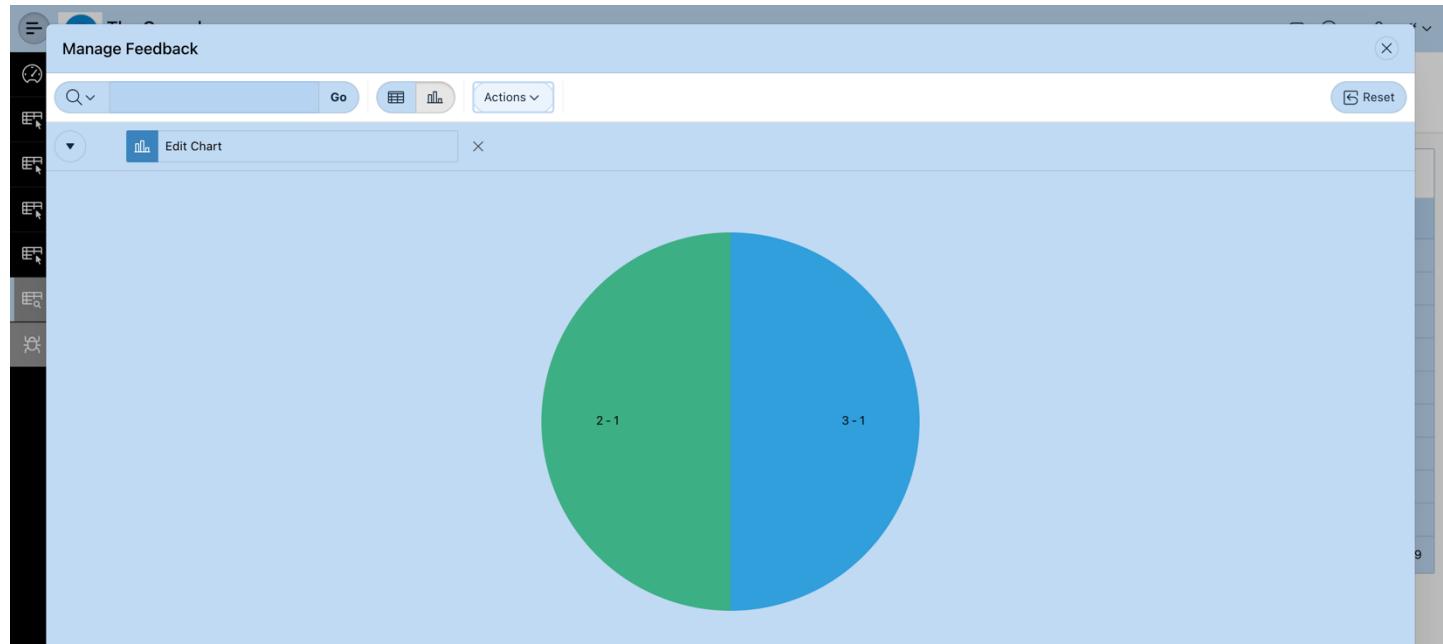


Figure 24. View feedback summary from customer

On the feedback page, the staff can view the summary of customer feedback.

z. Dashboard For Staff:

Dashboard For Staff



Figure 25. Dashboard for staff

- According to the ERD, each staff will take care of one customer; hence, the dashboard above summarizes customer-related statistics that the staff might be interested in, which are the number of customers by genders/countries and the booking bill price belonging to each customer.

3. Manager:
a. Customer Report

		Customer Name	Customer Account	Customer Gender	Customer DOB	Customer Address	Customer Country	Customer Email	Customer Phone	Staff of Customer	Customer ID	Customer Rank
<input checked="" type="checkbox"/>	Clara Ander...	smithpaul	Female	1/17/1997	60975 Jessi...	Vietnam	jessicapadill...	405441009	Ida Davis		5309	Unranked
<input type="checkbox"/>	Bessie Gonz...	kathleenmur...	Male	2/1/1992	39916 Mitc...	Vietnam	hmassey@ya...	974706765	Ida Davis		5596	Gold
<input type="checkbox"/>	Nellie Jacks...	mackenzie49	Male	9/22/1994	Jonesberg, ...	Vietnam	sean96@ya...	846252868	Ida Davis		5176	Unranked
<input type="checkbox"/>	Cora Herna...	robert91	Male	10/15/1998	8714 Mann ...	Vietnam	jrodriguez@...	680642305	Elizabeth Jo...		5945	Unranked
<input type="checkbox"/>	Bertha Rodri...	pgonzales	Male	1/15/1982	Vanessasad...	Vietnam	bryan80@g...	422410571	Elizabeth Jo...		5902	Bronze
<input type="checkbox"/>	Carrie White	brownjoe	Male	2/2/1966	Kellerstad, ...	Vietnam	salazardian...	737535861	Elizabeth Jo...		5637	Silver
<input type="checkbox"/>	Alice Garcia	walter07	Female	2/14/1997	48764 How...	Vietnam	tammywood...	315268949	Emma Brown		5791	Silver
<input type="checkbox"/>	Ella Taylor	lwood	Female	2/19/1997	East Sallybu...	Vietnam	sallywalker...	843138621	Emma Brown		5795	Unranked
<input type="checkbox"/>	Grace Thom...	monique84	Male	4/23/1955	848 Melissa...	Vietnam	kellylopez@...	653910625	Emma Brown		5492	Unranked
<input type="checkbox"/>	Annie Marti...	sayala	Female	2/16/1988	New Thoma...	Vietnam	dsalazarmar...	670912838	Margaret Jo...		5697	Unranked
<input type="checkbox"/>	Mabel Lee	imorton	Male	2/2/1988	North Lisa, ...	Vietnam	kirbyrachael...	454799579	Margaret Jo...		5654	Gold

Figure 26. Report customer for manager

- Function of this page (query):

The manager can use this page to search, edit or delete customer-related records.

- Features & Interaction (These Features are the same to the “Tour” page which are presented in section above so we will not list examples of these features again):
 - Search by typing: The manager can type the key word that want to search.
 - Search by drop down: the manager can choose a specific column to search for (customer name, gender, date of birth, address, country, phone, email and the supporting staff) in the dropdown list.
 - Edit: The manager can use the edit option to edit the data of each customer.
 - Add new row: The manager can use the Add Row button to add a new customer.
- Applied query: Create a view to show Customer_ID with supporting staff while renaming the columns

```

• CREATE VIEW CUSTOMER_INFO AS
• SELECT
•   Cu.Customer_ID,
•   U.User_Account AS Customer_Account,
•   U.User_Name AS Customer_Name,
•   U.User_Gender AS Customer_Gender,
•   U.User_DOB AS Customer_DOB,
•   U.User_Country AS Customer_Country,
•   U.User_Email AS Customer_Email,
•   U.User_Phone AS Customer_Phone,
•   Cu.Customer_Address AS Customer_Address,
•   Cu.Customer_Rank AS Customer_Rank,
•   S.User_Name AS Staff_Of_Customer
  
```

- FROM ((USERS U INNER JOIN CUSTOMER Cu ON U.User_ID = Cu.Customer_ID) INNER JOIN USERS S on Cu.Customer_Staff = S.User_ID);

b. Flight Report

		Flight From	Flight To	Flight Return	Flight Date	Flight Return Date	Flight Price	Flight Type	Partner Name
<input checked="" type="checkbox"/>	Phu Quoc	Mai Chau	Yes	1/1/2020	1/5/2020		2900000	Business	Bamboo Airlines
<input type="checkbox"/>	Da Lat	Ha Noi	No	11/1/2020			2800000	Business	Bamboo Airlines
<input type="checkbox"/>	Ha Noi	Mai Chau	Yes	9/2/2020	9/12/2020		2400000	Business	Bamboo Airlines
<input type="checkbox"/>	Ha Noi	Ho Chi Minh	Yes	1/2/2021	1/7/2021		2300000	Economy	Pacific Airlines
<input type="checkbox"/>	Ho Chi Minh	Ninh Binh	No	9/12/2020			3400000	Business	Pacific Airlines
<input type="checkbox"/>	Ha Noi	Dong Hoi	Yes	10/1/2020	1/5/2020		2400000	Economy	Vietjet Air
<input type="checkbox"/>	Da Nang	Dong Hoi	No	3/3/2020			2400000	Economy	Vietjet Air
<input type="checkbox"/>	Cam Ranh	Ha Noi	No	3/12/2020			3100000	Business	Vietjet Air
<input type="checkbox"/>	Ho Chi Minh	Dong Hoi	Yes	1/10/2021	1/9/2021		1200000	Economy	Vietnam Airlines
<input type="checkbox"/>	Da Nang	Cao Bang	Yes	3/2/2020	3/9/2020		1300000	Economy	Vietnam Airlines

1 rows selected Total 10

Figure 27. Report flight for manager

- Function of this page (query):

The manager can use this page to search, edit or delete flight-related records.

- Features & Interaction (These Features are the same to the “Tour” page which are presented in section above so we will not list examples of these features again):
 - Search by typing: The manager can type the key word that want to search.
 - Search by drop down: the manager can choose a specific column to search for (departure, destination, flight return status, flight- and return- date, flight type, price and flight provider) in the dropdown list.
 - Edit: The manager can use the edit option to edit the data of each flight.
 - Add new row: The manager can use the Add Row button to add a new flight.
- Applied query:

The query applied is the same to the query that used in “Staff” section above.

c. Tour Report

	Tour Name	Tour Price	Tour Detail	Tour Start Date	Tour End Date	Tour Id	Partner Name
<input checked="" type="checkbox"/>	Tam Cốc-Bích Đông	10500000	Boat ride to see Hoa L...	10/9/2020	10/12/2020	383	Sheppard-Tucker
<input type="checkbox"/>	Trekking Ha Giang	15000000	Travelling to Ha Giang...	10/5/2020	11/15/2020	388	AndBeyond
<input type="checkbox"/>	Trekking Sa Pa	18000000	A chance to experienc...	10/4/2020	11/13/2020	389	Kynder
<input type="checkbox"/>	Cao Bang Eco-Advent...	25000000	Visiting Cao Bang to s...	11/11/2020	11/15/2020	391	AndBeyond
<input type="checkbox"/>	Wild Tu Lan Explorer	7200000	Trekking and caving a...	10/8/2020	10/13/2020	385	Campos PLC
<input type="checkbox"/>	Mai Châus local tour	10000000	Homestay in Mai Chau...	10/6/2020	11/12/2020	387	CResponsible Travel
<input type="checkbox"/>	Cát Tiên National Park	4500000	Jungle trek and over-...	11/11/2020	11/15/2020	382	Chang-Fisher
<input type="checkbox"/>	Son Doong Expedition	69800000	Four days exploring wi...	9/9/2021	9/12/2021	384	Oxalis Adventurer
<input type="checkbox"/>	Fansipan Hiking	30000000	Hiking Fansipan - the ...	11/3/2020	11/8/2020	390	Levy Group
<input type="checkbox"/>	Cúc Phương National ...	2000000	Trekking through the ...	10/7/2020	10/10/2020	386	Archer-Patel

Figure 28. Tour Report

- Function of this page (query):

The manager can use this page to search, edit or delete tour-related records.

- Features & Interaction (These Features are the same to the “Tour” page which are presented in section above so we will not list examples of these features again):
 - Search by typing: The manager can type the key word that want to search in the tour table.
 - Search by drop down: the manager can choose a specific column to search for (tour name, tour price, flight partner, tour details, tour start- and end- date) in the dropdown list.
 - Edit: The manager can use the edit option to edit the data of each tour.
 - Add new row: The manager can use the Add Row button to add a new tour.
- Applied query:

The query applied is the same to the query that used in “Tour” section above.

d. Accessory Report

	Accessory Type	Accessory Detail	Accessory Price	Accessory Rent Date	Accessory Return Date	Partner Name
<input checked="" type="checkbox"/>	Trekking shoes	Used for rock-climbing wit...	1500000	5/20/2020	12/12/2020	AguaClan LLC
<input type="checkbox"/>	Water purifier	Best shoes for trekking an...	6000000	5/14/2020	10/1/2020	Trekkingnow Inc
<input type="checkbox"/>	LED filming light	Used to illuminate tent or ...	350000	6/15/2020	12/9/2020	Salomon Group
<input type="checkbox"/>	Reusable bag	Used for rock-climbing wit...	300000	6/10/2020	6/17/2020	Eagle creek
<input type="checkbox"/>	Sustainable luggage	Comfortable backpacks an...	2000000	6/11/2020	12/19/2020	Trekkingnow Inc
<input type="checkbox"/>	Bamboo utensils	Used to eat during camp, ...	100000	2/10/2020	6/1/2020	ALKILU LLC
<input type="checkbox"/>	Gloves	Used for rock-climbing wit...	300000	10/6/2020	12/7/2020	Eagle creek
<input type="checkbox"/>	Sustainable tent	Made from 100% recycled ...	300000	4/10/2020	8/12/2020	Salomon Group
<input type="checkbox"/>	Trekking clothing	Best cloths with versatile l...	900000	10/10/2020	5/2/2021	Earthlove PLC
<input type="checkbox"/>	Sleeping mat	Used for outdoor sleeping	5000000	5/12/2020	9/12/2020	ALKILU LLC

Figure 29. Accessory Report

- Function of this page (query):

The manager can use this page to search, edit or delete accessory-related records.

- Features & Interaction (These Features are the same to the “Tour” page which are presented in section above so we will not list examples of these features again):

- Search by typing: The manager can type the key word that want to search in the accessory table.
- Search by drop down: the manager can choose a specific column to search for (accessory type, price, provider, rent- and return- dates) in the dropdown list.
- Edit: The manager can use the edit option to edit the data of each accessory.
- Add new row: The manager can use the Add Row button to add a new accessory.

- Applied query:

The query applied is the same to the query that used in “Accessory” section above.

e. Booking Bill Report:

Report Booking Bill For Manager							
	Booking Total Price	Booking Voucher	Booking Customer	Booking Accessory	Booking Flight	Booking Tour	Booking Date
<input checked="" type="checkbox"/>	3050000	66048763	5309	489	271	382	11/11/2020
<input type="checkbox"/>	73340000	87115871	5679	443	284	383	11/9/2020
<input type="checkbox"/>	8000000	51393328	5637	415	299	385	10/29/2020
<input type="checkbox"/>	18350000	77840806	5176	475	292	388	10/19/2019
<input type="checkbox"/>	11123550	24115780	5665	424	225	386	10/29/2020
<input type="checkbox"/>	9000000	47593824	5795	447	285	384	11/11/2020
<input type="checkbox"/>	14747400	42194897	5945	461	227	387	11/3/2019
<input type="checkbox"/>	29260000	77730806	5654	473	257	389	5/19/2020
<input type="checkbox"/>	23670000	16097537	5492	483	233	390	1/5/2020

1 rows selected Total 9

Figure 30. Booking Bill Report

- Function of this page (query):

The manager can use this page to search, edit or delete information regarding to booking bill history of all customers.

- Features & Interaction (These Features are the same to the “Tour” page which are presented in section above so we will not list examples of these features again):

- Search by typing: The manager can type the key word that want to search in the customer booking history table.
- Search by drop down: the manager can choose a specific column to search for (customer name, tour name, tour start- and end-dates, tour price, departure, destination, flight type, flight price, accessory type, accessory price and total price) in the dropdown list.
- Edit: The manager can use the edit option to edit the data of each booking bill.
- Add new row or new data: The manager can use the Add Row function to add a new booking bill.

- Applied query:

The query applied is the same to the query that used in “Booking” section above.

f. Staff Report

	Staff Name	Staff Account	Staff Gender	Staff Dob	Staff Country	Staff Email	Staff Phone	Manager of Staff	Staff Id
<input checked="" type="checkbox"/>	Ida Davis	xbeck	Male	2/17/1997	Vietnam	gomezleslie@h...	245131612	2986	2188
<input type="checkbox"/>	Elizabeth Jones	celison	Female	2/18/1998	Vietnam	juancampos@h...	160568037	2986	2381
<input type="checkbox"/>	Emma Brown	chenjoseph	Female	2/17/1997	Vietnam	nhoward@hotm...	394296634	2613	2902
<input type="checkbox"/>	Margaret Johns...	janetsanchez	Female	1/15/1998	Vietnam	corey15@yahoo...	263874704	2986	2365
<input type="checkbox"/>	Minnie Miller	vmercado	Male	2/13/1992	Vietnam	vanessa89@gm...	641824209	2613	2426

1 rows selected Total 5

Figure 31. Staff Report

- Function of this page (query):

The manager can use this page to search, edit or delete staff-related records.

- Features & Interaction (These Features are the same to the “Tour” page which are presented in section above so we will not list examples of these features again):
 - Search by typing: The manager can type the key word that want to search in the staff table.
 - Search by drop down: the manager can choose a specific column to search for (staff name, gender, date of birth, country, email, phone and manager of that staff) in the dropdown list.
 - Edit: The manager can use the edit option to edit the data of each staff.
 - Add new row or new data: The manager can use the Add Row function to add a new staff.
- Applied query:

```

• CREATE VIEW STAFF_INFO AS
• SELECT
•   Staff_ID,
•   User_Account AS Staff_Account,
•   User_Name AS Staff_Name,
•   User_Gender AS Staff_Gender,
•   User_DOB AS Staff_DOB,
•   User_Country AS Staff_Country,
•   User_Email AS Staff_Email,
•   User_Phone AS Staff_Phone,
•   Staff_Manager AS Manager_Of_Staff
• FROM
•   Staff, USERS
• WHERE User_ID = Staff_ID;
  
```

g. Partner Report

The screenshot shows a web-based application interface for managing partners. On the left is a vertical sidebar with navigation links: Dashboard, Flight Report, Tour Report, Accessory Report, Voucher Report, Customer Report, Staff Report, Partner Report (selected), Hot-deal Flight Partner, Hot_deal Tour Partner, and Hot-deal Accessory Partner. Below these is a link to Booking Bill Report. The main content area has a title "Report Partner For Manager". At the top of the main area are buttons for Search, Go, Actions, Edit, Save, Add Row, and Reset. A table below contains data for 15 different partners, each with a checkbox in the first column.

	Partner Name	Partner Country	Partner Phone	Partner Commission	Partner Manager
<input checked="" type="checkbox"/>	Sheppard-Tucker	Luxembourg	260676096	2000000	2986
<input type="checkbox"/>	Campos PLC	Macedonia	564302429	2000000	2986
<input type="checkbox"/>	Archer-Patel	Guernsey	734595893	2000000	2613
<input type="checkbox"/>	Chang-Fisher	Mongolia	1227093178	2000000	2613
<input type="checkbox"/>	Oxalis Adventurer	Vietnam	307086589	0	2613
<input type="checkbox"/>	CResponsible Travel	Luxembourg	375441974	2000000	2986
<input type="checkbox"/>	Levy Group	Micronesia	204670670	0	2613
<input type="checkbox"/>	Pacific Airlines	Vietnam	1305203058	4000000	2613
<input type="checkbox"/>	Vietjet Air	Vietnam	3837502576	1200000	2986
<input type="checkbox"/>	Bamboo Airlines	Vietnam	9017947227	1200000	2613
<input type="checkbox"/>	Kynder	Anguilla	713312779	3000000	2986
<input type="checkbox"/>	Eagle creek	Ethiopia	556282532	3000000	2986
<input type="checkbox"/>	AquaClan LLC	Suriname	585571357	4000000	2986
<input type="checkbox"/>	Earthlove PLC	Malaysia	819323745	4000000	2613

Figure 32. Partner Report

- Function of this page (query):

The manager can use this page to search, edit or delete partner-related records.

- Features & Interaction (These Features are the same to the “Tour” page which are presented in section above so we will not list examples of these features again):
 - Search by typing: The manager can type the key word that want to search in the partner table.
 - Search by drop down: the manager can choose a specific column to search for (partner name, country, phone, commission, manager of that partner) in the dropdown list.
 - Edit: The manager can use the edit option to edit the data of each partner.
 - Add new row or new data: The manager can use the Add Row function to add a new partner.

i. Hot-deal Accessories partner

Partner Name	Partner Phone	Accessory Price	Accessory Id	Accessory Type	Accessory Detail	Accessory Rent Date	Accessory Return Date
ALKILU LLC	217680762	100000	441	Bamboo utensils	Used to eat during camp, could be thrown away at the site to decompose	2/10/2020	6/1/2020
Aguacan LLC	585571357	1500000	424	Trekking shoes	Used for rock-climbing with nylon reinforcement and touch-screen compatibility, designed specially for functionality	5/20/2020	12/12/2020
Eagle creek	556282532	300000	489	Reusable bag	Used for rock-climbing with nylon reinforcement and touch-screen compatibility, designed specially for functionality	6/10/2020	6/17/2020
Eagle creek	556282532	300000	475	Gloves	Used for rock-climbing with nylon reinforcement and touch-screen compatibility, designed specially for functionality	10/6/2020	12/7/2020
Earthlove PLC	819323745	900000	461	Trekking clothing	Best cloths with versatile layers and soft fabric with synthetic fibers to dry quickly during trail or hike	10/10/2020	5/2/2021
Salomon Group	990129139	350000	473	LED filming light	Used to illuminate tent or camp site with solar charger, completely bug and insect free thanks to the absence of UV rays	6/15/2020	12/9/2020
Salomon Group	990129139	300000	443	Sustainable tent	Made from 100% recycled material and no toxic dyes used, great for over-night jungle sleep	4/10/2020	8/12/2020

Figure 33. Hot-deal accessory partner

- Function of this page (query):

The manager can use this page to search all partners who provide cheap accessory for the customer which has the price below the average accessory price.

- Features & Interaction (These Features are the same to the “Tour” page which are presented in section above so we will not list examples of these features again):

- Search: The manager can type the key word that want to search in the cheap accessory table.
- Apply Checkbox Filter: The manager can tick the categorical data that want to search.
- Show chart: The manager can observe the bar chart or pie chart to visualize the quantity of each partner country.
- Sort by column: The manager can sort partner name, country and accessory price in an ascending or descending order by clicking to corresponding column that they choose.

- Applied query:

```

CREATE VIEW Partner_hot_deal_accessory AS
SELECT
    PARTNER_NAME,
    PARTNER_PHONE,
    ACCESSORY_ID,
    ACCESSORY_TYPE,
    ACCESSORY_DETAIL,
    ACCESSORY_PRICE,
    ACCESSORY_RENT_DATE,
    ACCESSORY_RETURN_DATE
FROM
    ACCESSORY, PARTNER
WHERE ACCESSORY_PARTNER = PARTNER_ID AND ACCESSORY_PRICE < (SELECT AVG(ACCESSORY_PRICE) FROM ACCESSORY)

```

m. Top Bills

Total Row Count 3

	Booking Voucher	Booking Customer	Booking Accessory	Booking Flight	Booking Tour	Booking Date
<input checked="" type="checkbox"/>	87115871	5679	443	284	383	11/9/2020
<input checked="" type="checkbox"/>	77730806	5654	473	257	389	5/19/2020
<input checked="" type="checkbox"/>	16097537	5492	483	233	390	1/5/2020

Figure 34. Top Bills

- Function of this page (query):

The manager can use this page to review all booking bills which have the prices above the average booking bill price.

- Features & Interaction (These Features are the same to the “Report Tour For Staff” page which are presented in section above so we will not list examples of these features again):

- Search: The manager can type the key word that want to search in the top booking bill table.
- Apply Checkbox Filter: The manager can tick the categorical data that want to search.
- Show chart: The manager can observe the bar chart or pie chart to visualize the quantity of each category.
- Sort by column: The manager can sort customer name, tour name, tour start- and end-dates, tour price, accessory type and flight price in an ascending or descending order by click corresponding column that they choose.

n. Dashboard1 For Manager

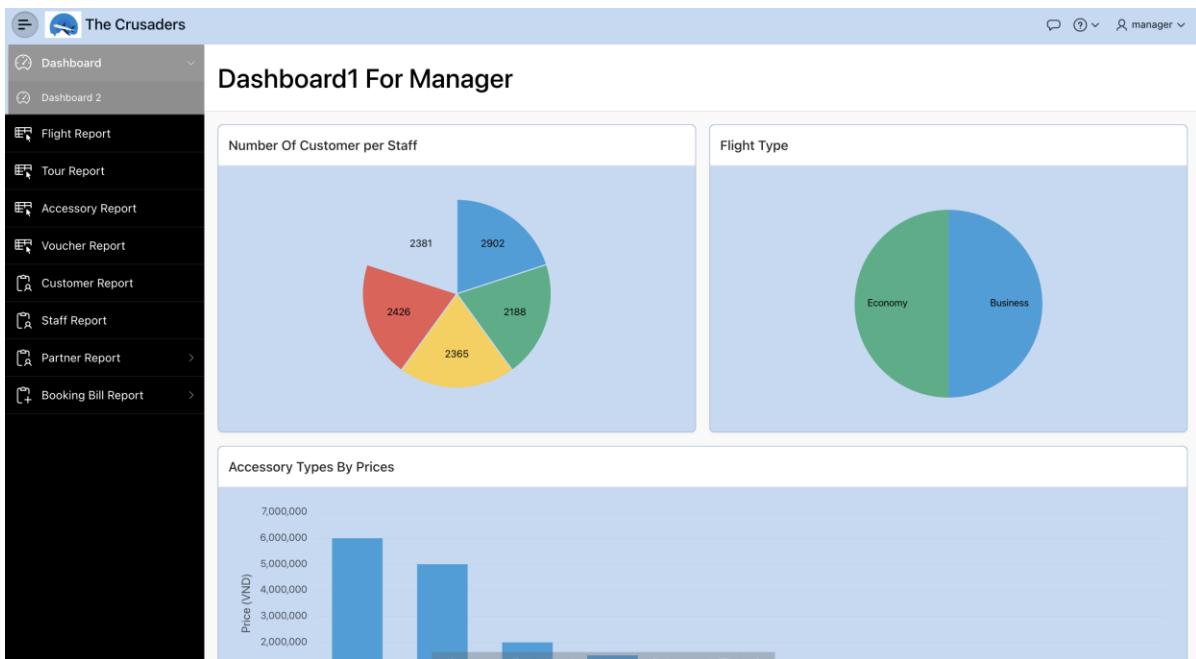


Figure 35. Dashboard number 1 for manager

Note that the pie chart on the left-hand side shows how many customers are taken care by which staff. While the other pie chart counts the number of flight types provided by all flight partners. The bar chart shows the accessory price by its type (from all partners) sorted in a descending order.

o. Dashboard2 For Manager

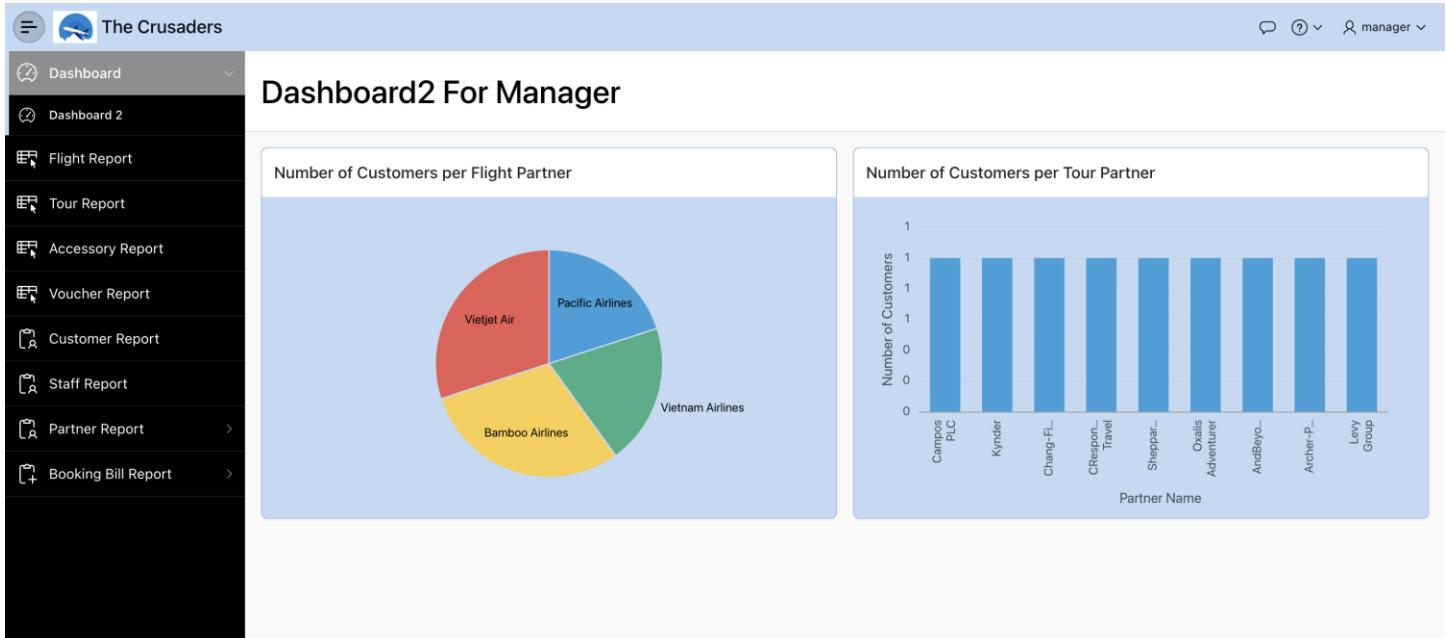


Figure 36. Dashboard number 2 for manager

According to the ERD, a manager manages one or more partners; hence, the dashboard above summarizes partner-related statistics that the manager might be interested in, which are the number of customers using services provided by flight/tour/accessory partners.

Reflection

Pham Minh Viet (s3695319)

At the beginning of the semester, I was assigned to make the app front-end, then I made it. From the middle of week 2 till the end of week 4, I learned how to use Oracle Apex everyday, then I spent about 2 more days in week 8 to apply what I learned into my project. Then I spent the half of Saturday (week 10) to make the app. I wish I had some more time do some extra work, which could make the app as good as I expected. Specially, I failed to add images representing accessory items and I did not have enough time to sort the problem out within Saturday morning (week 10). In addition to that, I have learned how to convert conceptual design (ERD) into logical design (SQL). I would like to give a special credit to Tin, who assisted me in understanding that task and spent time on writing a bunch of 'Insert' command lines. I also really appreciate Han's work, who has carefully double-checked the database creation part. They have done labor-intensive tasks that I would never think that I could do.

However, the thing that I value even more than such knowledge is that I have reached a new level of patience and gentleness in heated discussions, which will be relevant to my further development. I am really into discussions with the hope of refining my own logical thinking and seeking something that is truly valuable to me. I would like to conclude this reflection by stating that a discussion might lead to a conflict, but no conflict would happen if mutual respect and empathy towards others have been established in the first place.

Tran Trong Tin (s3694839)

Through the project I have a lot of knowledge about technical skills and necessary experiences on teamwork.

In terms of technical skills, I have learnt a new language such as SQL to construct and manage a simple database. Furthermore, by implementing the database web app, I also have a chance to learn how the database (backend) interacts with the user interface (frontend), which allows me to design and manage a good interface for the users. In addition, I also learned how to use APEX Oracle, which is a low-code development platform, to create our own database application.

In terms of teamwork, as our team are from different schools (An and Han who are from the school of Economics and Finance, me and Viet who are from the school of Science and Technology) and we have been struggling to communicate and express the ideas to each other and experienced some conflicts and intensive arguments. However, at the end, we have settled down every conflict by holding more meetings and asking the right questions, which have contributed to my experience on teamwork management.

On the other hand, although some communication conflicts exist during the project, the time management of our team is quite good and effective. The time milestone that we have set is successfully achieved on time by the experiences of An and Han. These management skills are also very valuable that I gain from them.

Phan Le Minh An

At first, the team and I met with each other in a very optimistic and relaxing manner: we created a perfect plan with a perfect topic and scope. We really thought everything would be easy. However, continuing on the journey, we started to hit stumbling blocks. After the first assignment, we let off, "bathing in our glory" of a high-mark assignment without starting the final project soon. Two weeks before the deadline, we realized that we were really behind. The team began to have very heated arguments about the website design and whether certain criteria were demanded for the project. We had to email the lecturer for a way out, or an answer to our debates. Luckily, after sitting down and

working things out together, we decided that even though the goal is the same - to get HD, our expectations are vastly different in terms of the details. It could be the fact that we all come from different majors. We were able to resolve the conflict by assigning different tasks to people depending on their expectations: if you expect more, then you do more work.

Personally, I have learnt that every conflict and every problem is solvable: it depends on how patient we are with ourselves and the circumstances at hand. Moreover, the lesson is not applicable to our conflict. During the process of trying to learn APEX, it was very frustrating since the error message kept popping up without specifying which error I made on which line. I had to sit down, google, and ask people around before actually getting the answer. Furthermore, I was able to design our application by pasting and adjusting the HTML/CSS/JavaScript online. Everything is indeed doable!

Reflection (Han):

At first, I was hesitant in choosing my teammates for the project. Looking around, I only know An who is the same major as me. Despite the difficulties, I spotted a final-year engineering dual who are also looking for teammates. We did not set any expectations at first, and I think that led to most of our conflicts later in the project. We assumed that naturally people will fit in perfectly in any scenario and work harmoniously together. Apparently, we were clearly wrong. Half way through the process, I got really mad at my teammates. I tried to convince them to produce a sql file for data insert, but nobody listened, and I had to email the lecturer for a proof. At the peak of the conflict, a teammate made me realize how I had lost my temper and became unreasonable in my arguments. Reflecting back, maybe anger could not solve the problem effectively at hand, and instead, I could have diverted my energy into figuring out the solution - like asking the lecturer sooner.

Regardless, I have learnt a ton about database management during the process. Before, I was able to just decipher a business-side of a management system but not a technical side like a database. I'm now able to create many complex and logical queries with clear business purposes.

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