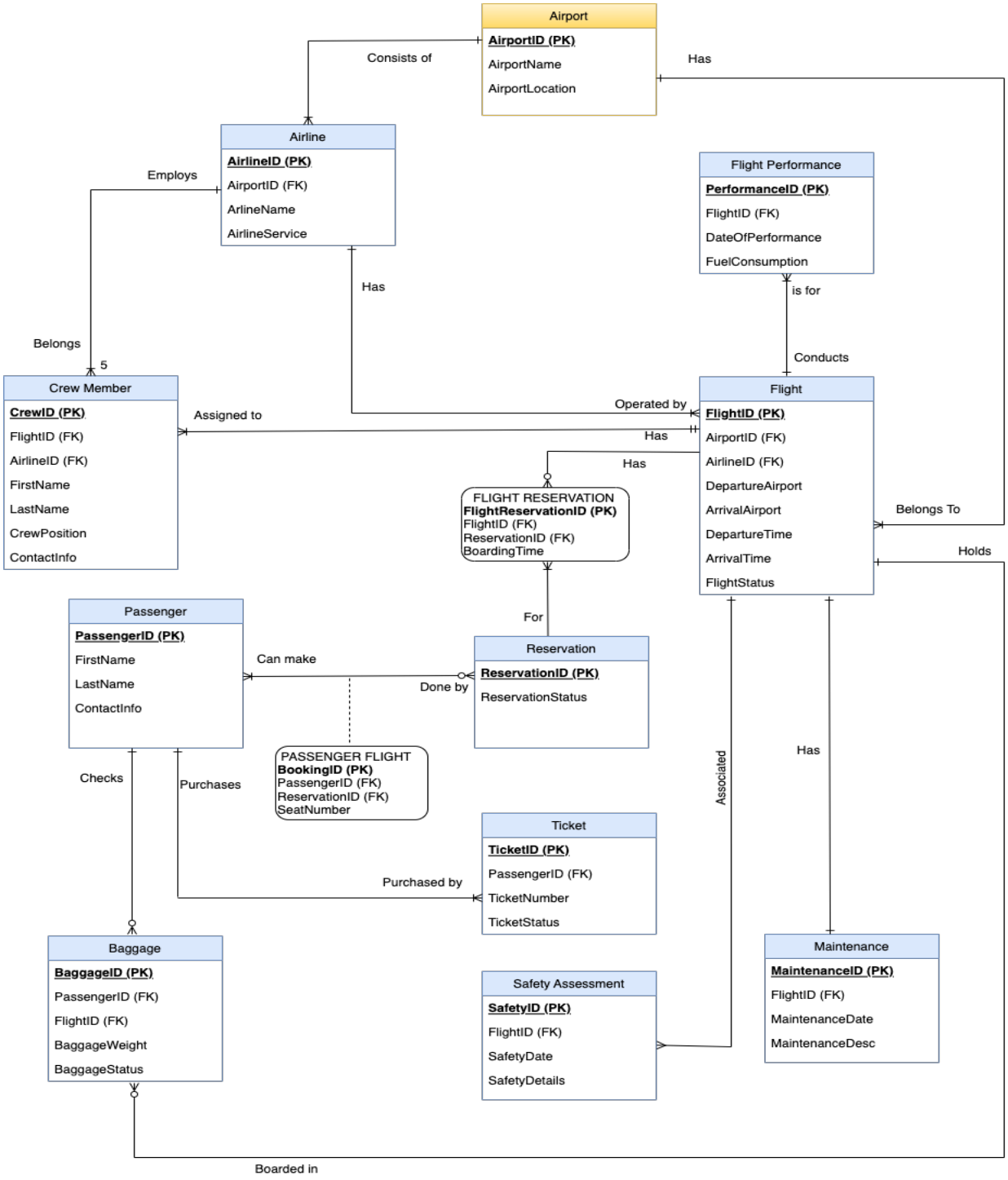
ER DIAGRAM - AIRLINE MANAGEMENT DATABASE SYSTEM



- Entities:

1. **Airport:** This entity which has properties like AirportID (PK), AirportName, AirportLocation manages/consists of multiple airlines

2. **Airline**: This entity, which has properties like AirlineID (Primary Key), AirportID(Foreign Key), AirlineName and AirlineService represents the airline itself.

3. **Flight**: Contains the following attributes: FlightID (Primary Key) AirportID (Foreign Key), AirlineID(Foreign Key), DepartureAirport, ArrivalAirport, DepartureTime, ArrivalTime, FlightStatus represents a planned flight.

4. **Passenger**: This entity represents a traveler and has the following properties: PassengerID (Primary Key), FirstName, LastName, ContactInfo.

5. **Reservation**: Contains the properties ReservationID (Primary Key), and ReservationStatus. Reservations are related to passengers.

6. **Ticket**: TicketID (Primary Key), PassengerID(Foreign Key), TicketNumber, and TicketStatus are properties that provide the specifics of a passenger's ticket.

7. **Baggage**: This entity represents baggage details and has the following attributes: BaggageID (Primary Key), PassengerID (Foreign Key), FlightID (Foreign Key), BaggageWeight, BaggageStatus.

8. **CrewMember**: This entity represents the crew members of the airline and has the following attributes: CrewID (Primary Key), FlightID (Foreign Key), AirlineID(Foreign Key), FirstName, LastName, ContactInfo and CrewPosition.

9. **Maintenance**: Contains the following attributes: MaintenanceID (Primary Key), FlightID (Foreign Key), MaintenanceDate, and MaintenanceDescription. This represents records of aircraft maintenance.

10. **SafetyAssessment**: Contains the characteristics SafetyID (Primary Key), FlightID (Foreign Key), SafetyDate and SafetyDetails. It represents safety and security assessments.

11. **FlightPerformance**: This entity contains characteristics such as PerformanceID (Primary Key), FlightID (Foreign Key), FuelConsumption and DateOfPerformance that describe the performance of a flight.

- Relationships:

1. Airport consists of many airlines, so the relationship is one-many between airport and airline also, airport has many flights so, relationship between airport to flight is one-to-many.

2. Airline operates Flight: Since an airline operates several flights, there is a one-to-many link between Airline and Flight. Airline hires CrewMember: Since an airline employs several crew members, there is a one-to-many link between Airline and CrewMember.

3. A flight and a reservation are related in a many-to-many manner through flight reservation associate entity. Flight has many reservations and reservations are available for many flights.

4. A Passenger and a reservation are related in a many-to-many manner through passenger flight associate entity. Reservation done by many passengers and passengers can make many reservations through passenger flight relationship.

5. A passenger buys a ticket: There is a one-to-many link between the passenger and the ticket since a passenger can buy more than one ticket.

6. A person can check more than one piece of baggage. This creates a one-to-many link between the passenger and the baggage.

7. Maintenance Associated with Flight: There is a one-to-one linkage between maintenance and flight since a single flight is linked to single maintenance record.

8. The relationship between the safety assessment and the flight is many-to-one as a single flight is linked to several safety evaluations.

9. The link between FlightPerformance and Flight is many-to-one as a single flight might have several performance records attached to it.

10. The flight holds passenger baggage's so the relationship between flight and baggage is one-to-many.

- Key Design Decisions

The database records all the pertinent data about flights, travelers, reservations, crew, maintenance, safety evaluations, and flight operations.

Data integrity and effective management of airline operations are ensured by the linkages between organizations that have been formed based on the scope and purpose supplied.

To gather, analyze, and report data for the organization's goals and missions, this ERD serves as the basis for an extensive Airline Management System database.