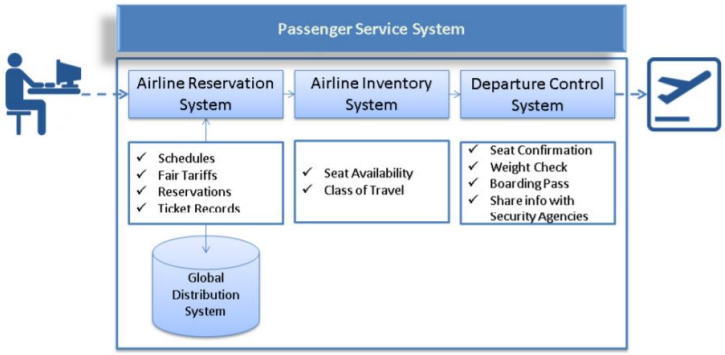
AIRLINE RESERVATION

Table of Contents

1.Passenger Service System (PSS) - Overview



The Passenger Service System usually comprises of the Central Reservation System (CRS) in other words booked inventory, an airline inventory system (free inventory) and a departure control system (DCS). It is basically the technology an airline needs to run its business successfully.

The **airline inventory system** may or may not be integrated with the CRS. The system contains all the airline's flights and the available seats. The main function of the inventory system is to define how many seats are available on a particular flight by opening or closing an individual booking class in accordance with rules defined by the airline.

The **Central Reservation System (CRS)**, is the system that allows an airline to sell their inventory (seats). It contains information on schedules and fares as well as a database of reservations (or passenger name records or PNR) and of issued tickets.

This Document is mainly focusing on the Reservation and Ticketing functionalities which helps to understand the basic terminology and the core functionalities about PNR and ticketing which help you to plan your trip, approach booking channel with basic information about your travels including Flight, Date, Routes, etc and confirm your booking in a Flight and travel with valid E-ticket.

Get Ready for the Trip…

2.Central reservation system

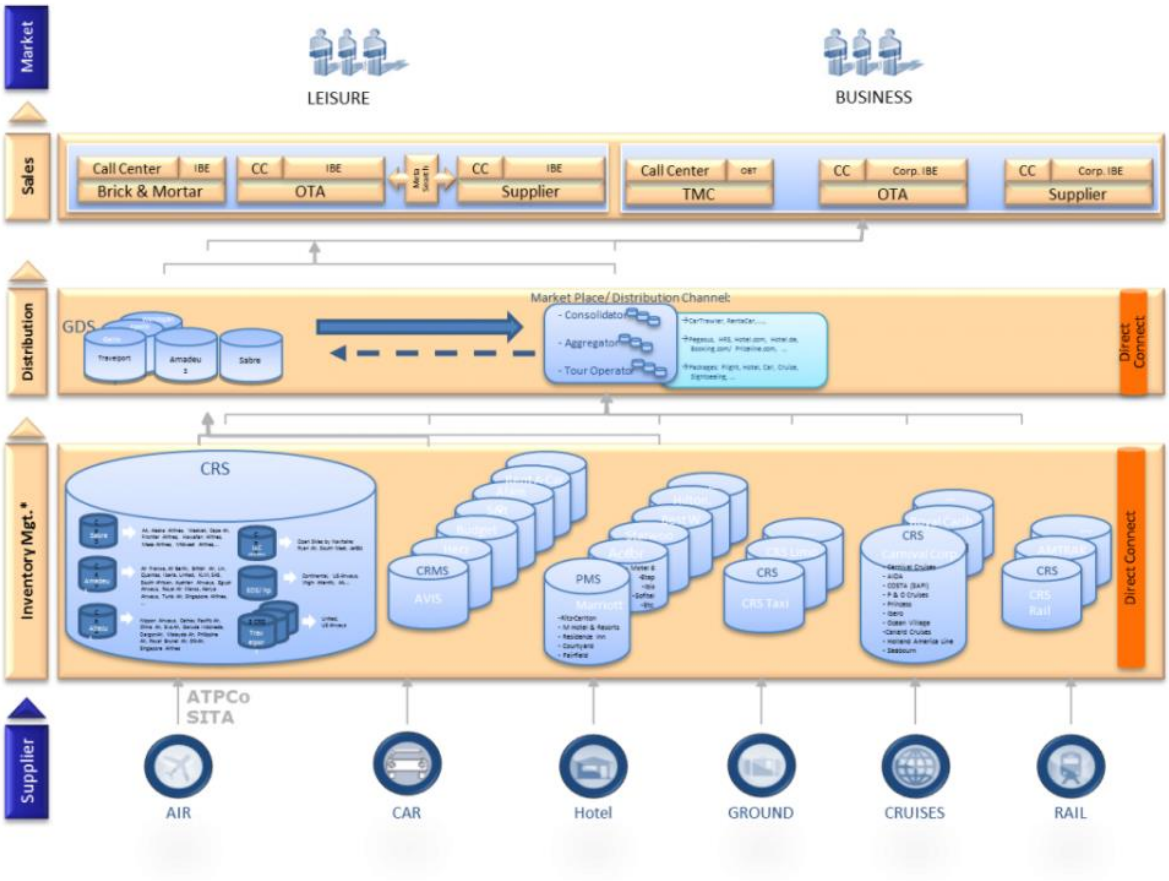
An airline or central reservation system serves as a database for flight schedules, available seats, fares and rules for each booking class, and passenger profiles. Apart from storing flight-related information, its major functions include:

- managing reservation requests and cancelations;
- displaying flight schedules, available seats, and prices in response to requests from passengers or intermediators (travel agents, call centers, General Distribution Systems or GDSs, Online Travel Agencies or OTAs);
- generating Passenger Name Records (PNRs) — personal codes, containing data on travel dates and itinerary, ticket details, baggage, and the passenger's name and contacts; and
- ticketing — issuing tickets (either paper or electronic) and storing ticket records.

3.Airline inventory system

The primary goal of an airline inventory system is to control the availability of seats in different cabins and manage fare groups or buckets. The AIS opens or closes fare buckets according to the rules set by an airline.

4.Travel Distribution Landscape



The travel market, like any other industry, is based on supply and demand. The supply side is differentiated into providers for air travel, cars, hotels, cruises, rail travel, etc. Demand arises from end customers who act via an agent for the most part in order to obtain an adequate overview of the multitude of offers. Thus, the value chain in the travel industry can be divided into five parts:

1. **Supplier:** airlines, hotels, car rental companies, etc.
2. **Inventory management:** administration of the inventory in a CRS
3. **Distribution:** usually Global Distribution Systems (GDSs), but also aggregators, consolidators and organizers
4. **Sales:** End customers can arrange their travel purchase through the agency/TMC, one of the online agencies (OTA, OTMC) or even the provider directly on the corresponding website (direct).
5. **Market:** the traveler or the company

Global Distribution System (GDS)

A global distribution system is a huge database that stores and updates enormous information about inventory and hotel rates to travel agents and travel websites. This system is responsible for the extensive growth of the travel industry and was the stepping stone of most internet based travel services.

Through this system, travel agents/agencies can access real-time availability, price and offers of flight tickets, hotel rooms, rental cars, cruises, ferry reservations, trains and other services.

GDS and Computer Reservation System (CRS) have the same functions but, CRS only provides information about airlines. With GDS, you can reserve a ticket, book a room or rent a car. This is why they are known as Global Distribution System because you can reserve everything with GDS.

SABRE, Amadeus , Travelport (Galileo , Apollo, Worldspan) are the major GDSs in the world.

Online Travel Agents (OTAs)

Online Travel Agents (OTAs) is a place where travelers can get access to a whole range of travel services such as accommodation, flights, travel packages, car rentals, tours and activities. Unlike travel metasearch engines, users can directly book through OTAs.

Travelers usually find these websites useful as they can easily compare rates, reviews, and availability of accommodation options at one glance. Any hotel can easily be listed on an OTA without any charge. They just have to add hotel photos, proper descriptions, rooms, rates, etc. Although appearing on

an Online Travel Agencts (OTA) is free of charge, hotel owners have to pay a commission of 15%-20% when a booking is confirmed via an OTA.

Famous online Travel Agents are:

- Expedia
- Priceline
- Orbitz
- Travelocity
- Yahoo! Travel

Travel Metasearch Engines

A metasearch engine is a tool that aggregates data from other search engines and produces results to the user. In the travel industry, the metasearch engines aggregate rates and availability of hotels from different sources mainly from OTAs and sometimes directly from hotels. This makes things quite easy for users. All they have to do is find the type of hotel they want, enter their journey dates and compare the different options.

Metasearch engines do not do the actual booking; they just list the price and availability. When you select a particular hotel, you will be redirected to the OTA in which the fare was displayed to make the actual booking.

As far as the business model goes, travel metasearch engines earn revenue through completed transaction referred through the search engine. It also earns money by placing ads for travel agencies through CPC (cost per click) or CPI (cost per impression) model.

Famous Metasearch engines:

- Trivago
- Kayak
- Skyscanner
- TripAdvisor
- Google (with Google Hotel Finder)

5.Flight Booking Process:

when a traveler or a travel agent books a flight, they have a choice:

Flight search

Indirect channel: OTA, GDS, metasearch engine. A user looks for the right flight via a flight booking engine on a third-party website or via a GDS terminal. As the flight is chosen, a third-party sends the request to the GDS, which accesses the airline's CRS.

Direct channel: Airline eCommerce website. If a traveler books directly from the provider, the process skips the whole GDS part and goes straight to the CRS.

Reservation management

CRS' basic functions are inventory and reservation management, passenger name record (PNR) generation, payment gateway integration, customer information management, booking and cancellation management, refund management, and email notification. While booking a flight, a customer can select a seat right away, but as a rule, airlines charge an additional price for this. Otherwise, the seat can be selected during online check-in or be randomly assigned. After a user pays for the ticket, the system generates a passenger name record (PNR).

What is PNR (Passenger Name Record)?

Passenger name record (PNR) is a personal code that contains a traveler's information and itinerary. Depending on the booking source, it's created either by an airline's CRS or a GDS. The PNR is generated based on a passenger's personal information, contact details, ticket number, and itinerary. An airline uses a PNR to easily track the passenger's record and exchange information between different airlines.

Ancillary booking

Ancillary revenue reached $65 billion worldwide in 2018, remaining a major source of airline revenue, especially for low-cost carriers. Additional service booking and distribution are handled via Merchandising Systems that we mentioned earlier

Choosing additional services

Ancillary services include an ability to reserve a particular seat, additional baggage, extra legroom, or in-flight meals. When a traveler adds ancillary services during the booking, a Merchandising System generates special service request number (SSR). It's a message to the supplier with a request for any ancillary service that's usually included in the ticket.

Using loyalty programs

Loyalty program operations are usually managed by airline merchandising systems.Being a member of a frequent-flyer or airline loyalty program, a passenger can use earned miles accumulated from each flight, or points for purchasing extra services from airlines. These points can be exchanged for discounts or benefits, like upgrading to business class. Depending on the airline, customers can either log in via their accounts while purchasing tickets directly from an airline website or get a loyalty program participant's number to use for booking from a third-party. Also, these systems keep a particular number of places for frequent flyers reserved in CRS.

Fares and payment

To receive a ticket with a PNR (sometimes called a booking confirmation number), a traveler must pay the fare. A fare is the amount of money a person must pay for the seat, taxes, and third-party service fee if any. The fare can also include a charge for ancillary services.

The allocation of fees between airlines, GDSs, OTAs, and customers works the following way:

1. Airlines pay GDSs for distribution
2. GDSs then pay OTAs to close the sale
3. Travel agents booking from the GDS terminal pay a fee for using its service
4. Customers booking via an OTA sometimes pay a service fee

If it's direct booking, a customer pays the airline's payment gateway directly and as soon as the payment is processed, a CRS is notified and generates a booking confirmation number. If the booking is made via OTA or metasearch website, they use their own payment gateway.

Payment processing

A payment gateway is a third-party service that not only processes all financial operations between customer and merchant, it also ensures data safety. The main operations of a payment gateway are authorization (checking that a user has enough money to pay), capture (sending the funds to the merchant's account), sale (regular payment for purchases), a refund (money return), and void (a refund for not-captured funds).

The advantage of this service is that a customer can book and pay in one place.

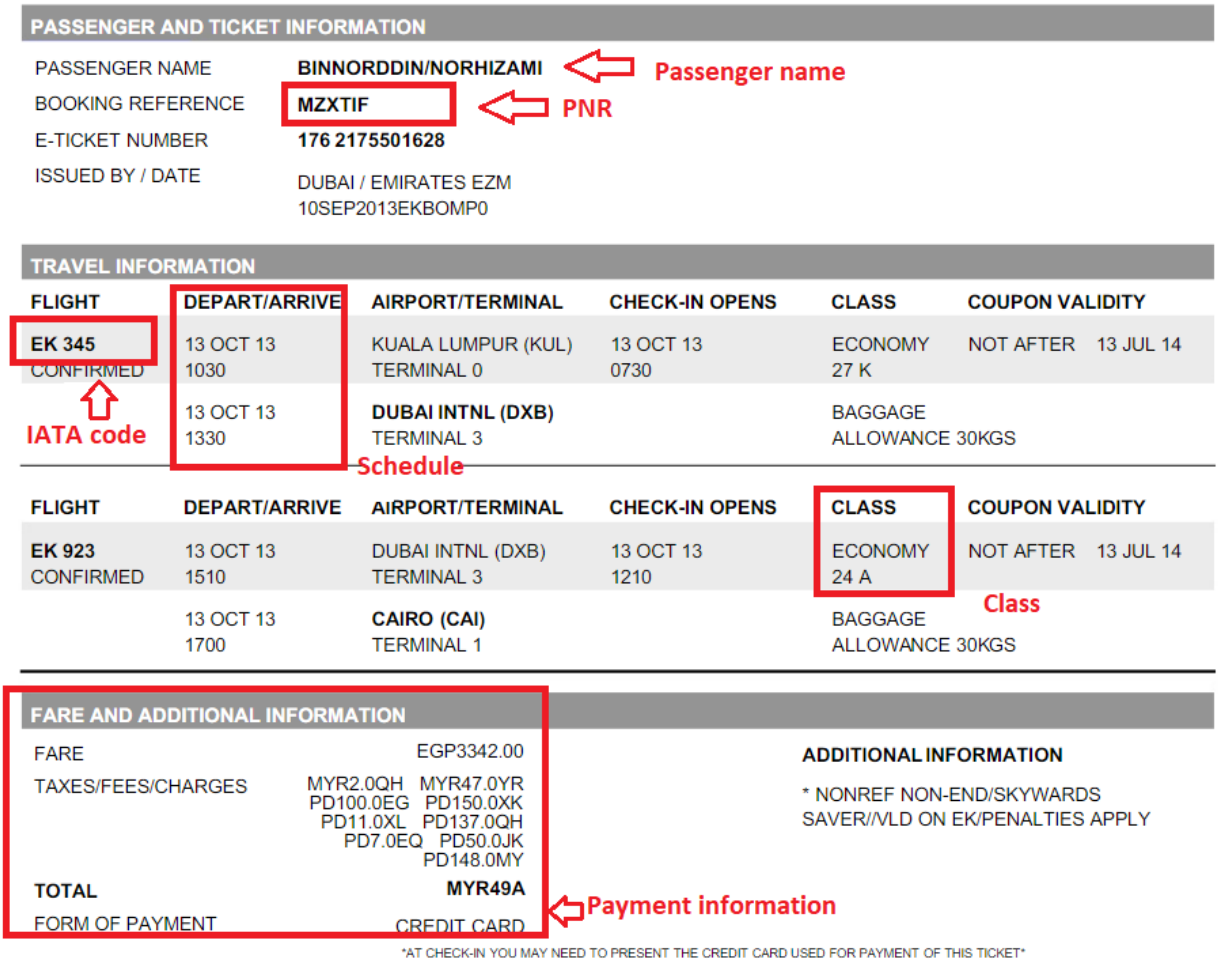
As soon as the payment was processed by the payment gateway, the airline's CRS can generate a booking confirmation number and issue an electronic version of a ticket.

Ticketing

The flight ticket is an agreement between a traveler and a carrier. It makes ticketing a key part of this process. Obviously, there's no chance to get on a flight if there's something wrong with a ticket, like an incorrect name entered.

Personal name record (PNR) generation

Ticketing is a different concept from booking. Ticketing means that the seat is paid for, it won't be taken, and it belongs to a particular person. This is ensured by a PNR. It's a 6-digit code on an e-ticket that allows airlines to validate the booked seat. If it's a trip that consists of several flights by different airlines, an interline booking occurs. For such cases, airlines create an interline commercial agreement for codeshared flights. Regarding this agreement, different airlines issue a single ticket with one PNR, which is issued by one of the airlines as defined by an agreement.



Emirates e-tickets example.

6.Bilateral Selling Agreements:

Interline Agreement

- Interline agreements between airlines facilitate travel for passengers who require flights with more
  than one airline to reach their final destination.
- Interline agreements allow air passengers to travel across the networks of multiple airlines with the convenience of a single reservation.
- The agreement allows each airline to accept the other's ticket and covers baggage transfers and liability.

Advantages for the Airline

The main advantage of interlining from an airlines' perspective is revenue increase. The two interlining airlines have the opportunity to offer a highly competitive joint fare that attracts customers to their particular route.

Benefits for the Passenger

- Air travellers benefit from interline agreements from a cost and convenience standpoint.
- connecting flight takes the passengers to their final destination.
- Fares between the regional airport and the hub airport are often high, but an interline ticket to the final destination is normally considerably cheaper than the sum of the two local fares.
- Airlines automatically transfer baggage at the connecting airport
-

Code-share Agreement

A code-share agreement simply allows for a flight operated by one carrier (which will offer the flight for sale under its own code or designator and associated flight number, such as 'SQ1234'), also to be marketed by another carrier, under that other carrier's code and flight number (e.g. 'LH5678').

The carrier operating the flight (in this case, carrier with code 'SQ') is known as the "operating carrier", while the carrier marketing the flight under its own code (in this case 'LH') is known as the "marketing carrier".

The carrier that issues tickets to the passenger for a journey involving a code-share flight is known as the "ticketing carrier". Where the complete journey does not involve a third carrier, the ticketing carrier will generally be the same as the marketing carrier.

The underlying motivation of airlines in entering into code-share agreements is to broaden the offer that airlines can make to customers in terms of the number of destinations and, in some cases, the flight timings that they can offer potential

customers, without the costs and difficulties involved in additional investment in equipment or in mergers with other airlines.

7.Message for Communication:

IATA standard messages are used to exchange between airline systems. Based on the response from receiving airlines itinerary / seat will be confirmed on particular airlines.

There are 3 types messages used nowadays:

Type A - Edifact Messages used for Ticketing

Type B - TeleType messages used for Reservation

XML used for API.

Process:

- Airline A sending seat request to Airline B .
- Airline B will check itinerary for the requested class of service.
- Airline B will send a confirmation message to Airline A if seat is available. Otherwise send a reject message.

- If seat is confirmed, inventory will be decremented by number of seats requested.

- If passenger cancelled the booking , inventory will be incremented by number of seats returned.

Status code:

A status code indicates the status of an air segment. The status is an important indicator of what status the flight segment is in. This can indicate the carrier has confirmed the segment, the segment is on waitlist, a schedule change has been received from the carrier, and many other possibilities.

The following status codes can be returned for an AirSegment.

Status Code	Description
AF	AA Advantage ticket
AK	Passive - Confirmed outside Galileo system (This is only applicable in 1G)
AL	Passive- Waitlisted outside Galileo system (This is only applicable in 1G)

Status Code	Description
AN	Passive- Requested outside Galileo system (This is only applicable in 1G)
BK	Passive- Booked with carrier. Will generate message to carrier when air segment is cancelled.
BL	Passive- Waitlist segment
BN	Requested outside Galileo system
CH	Passive- Code share holds confirmed
CK	Advance check-in. Boarding pass issued
CS	Code share sell segment
DK	Link book last seat
DL	Deferred waitlist
DS	Desires segment
DX	Passive - Broken marriage / Active-Authorized partial cancellation within a marriage
EK	EMD confirmed
FS	Free sale
GF	Firm booking
GK	Guaranteed/Merged. Also used in 1V as Passive - Group confirmed
GL	Waitlist with carrier
GN	Group booking
GO	No action taken on group request.
HA	Have requested. Airline requested one of their own segments
HD	Holding confirmed; EMD required
HI	Holding confirmed EMD issued (EMD can only be issued if Ticket is Issued)
HK	Holds confirmed
HL	Holds waitlist
HN	Holds need/confirmed
HQ	Space prev. request
HS	CO changes
HW	Have waitlisted. Airline waitlisted one of their own segments

Status Code	Description
HX	Cancel confirm hold
IG	Involuntary upgrade
IH	Inhibit status code
IK	Infant no seat
IN	If not holding need
IS	If not holding sell
IX	If holding cancel
KD	Issue EMD
KK	Carrier confirmed
KL	Waitlist confirmed
LK	Passive - Link booking - guaranteed sell
LL	Add to waitlist
MB	Move reaccommodation - Pax was on standby status for flight affected
MK	Non messaging Passive segment.
ML	Waitlisted
MN	Not available
MR	Requested
NA	Need alternate
NN	Requesting segment
NO	No action taken
NS	No show
OB	Overbook
OX	Cancel only if requested segment is available
PA	Priority waitlist-emergency travel
PB	Priority waitlist
PC	Priority waitlist
PD	Priority waitlist
PK	Discounted passenger.

Status Code	Description
PN	Pending need
PS	Passive
PW	Priority waitlist
RR	Reconfirm
SB	Boarded standBy
SC	Schedule change
SD	Schedule change/re-booking; EMD already issued. Document number must be included in the SSR
SP	Passive-space protected
SQ	Space request - bilateral use
SS	Sell segment
TK	Schedule Change. Advise passenger of new scheduled times.
TL	Schedule change waitlist. Advise passenger of new scheduled times.
TN	Schedule change. Is Pending Need. Advise passenger of new scheduled times.
UC	Unable to confirm or waitlist
UN	Unable - no flight
US	Unable to sell
UU	Unable to confirm. Waitlist requested
WK	Schedule change of a confirmed segment
WL	Schedule change of a waitlisted segment
WN	Schedule change of a needed segment
XK	Cancel seg with change
XX	Cancel segment
YG	Involuntary upgrade
YK	Hold confirmed Airline space
ZK	Passive- API booking

Status code in Webservice Response (XML):

The air status code will be reflected in a UniversalRecordRetrieve response and AirCreateReservation response within the air segment. The below example indicates that the air segment is confirmed by showing the status code of HK:

```
<air:AirSegment Key="EvgLQM3R2BKABcuTCAAAAA==" Group="0" Carrier="SK"
CabinClass="PremiumEconomy" FlightNumber="804" ProviderCode="1G"

Origin="LHR" Destination="OSL" DepartureTime="2020-09-
20T10:20:00.000+01:00" ArrivalTime="2020-09-20T13:30:00.000+02:00"
ClassOfService="Y"

ETicketability="Yes" Equipment="73W" Status="HK" ChangeOfPlane="false"
GuaranteedPaymentCarrier="No"

ProviderReservationInfoRef="EvgLQM3R2BKA7buTCAAAAA==" TravelOrder="1"
ProviderSegmentOrder="1" OptionalServicesIndicator="false">

  <common_v49_0:SegmentRemark Key="EvgLQM3R2BKADcuTCAAAAA==">SAS
IRELAND</common_v49_0:SegmentRemark>

  <air:FlightDetails Key="EvgLQM3R2BKACcuTCAAAAA==" Origin="LHR"
Destination="OSL" DepartureTime="2020-09-20T10:20:00.000+01:00"

ArrivalTime="2020-09-20T13:30:00.000+02:00" FlightTime="130"
TravelTime="130" Equipment="73W" OriginTerminal="2"
AutomatedCheckin="false"/>

</air:AirSegment>s
```