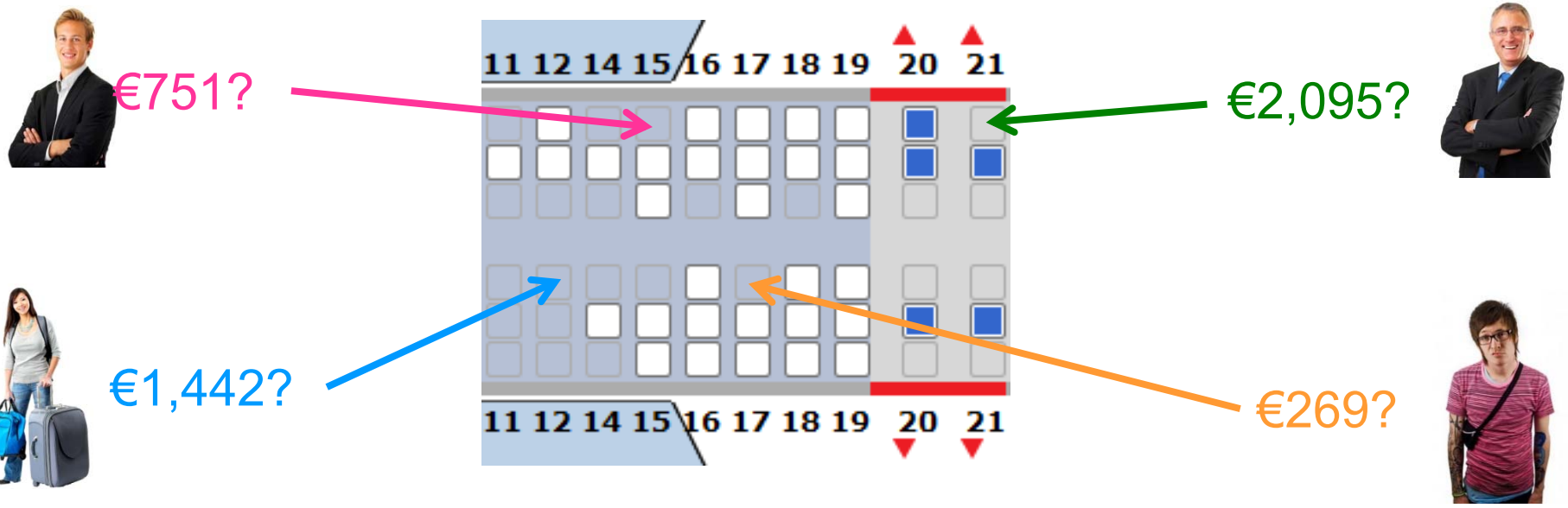
Airline Revenue Management

Objectives

- Explain why revenue management is important
- Define best revenue management tactics that are important for your airline
- Describe which ancillary revenues can improve your airline's bottom line and why it is important
- Explain how social media, online booking and big data can cut costs and improve your airline revenue

Why does airline pricing seem so random?

- **How did another passenger pay 50% less than I did?**
- **Why did the fare increase €1,000 overnight?**
- **Does it really cost the airline 3x as much to fly on Thursday?**
- **Why do I have to pay €59 to sit in the exit row?**



Airline Revenue Management – Overview

Why is revenue management important?

How do economic concepts drive revenue management?

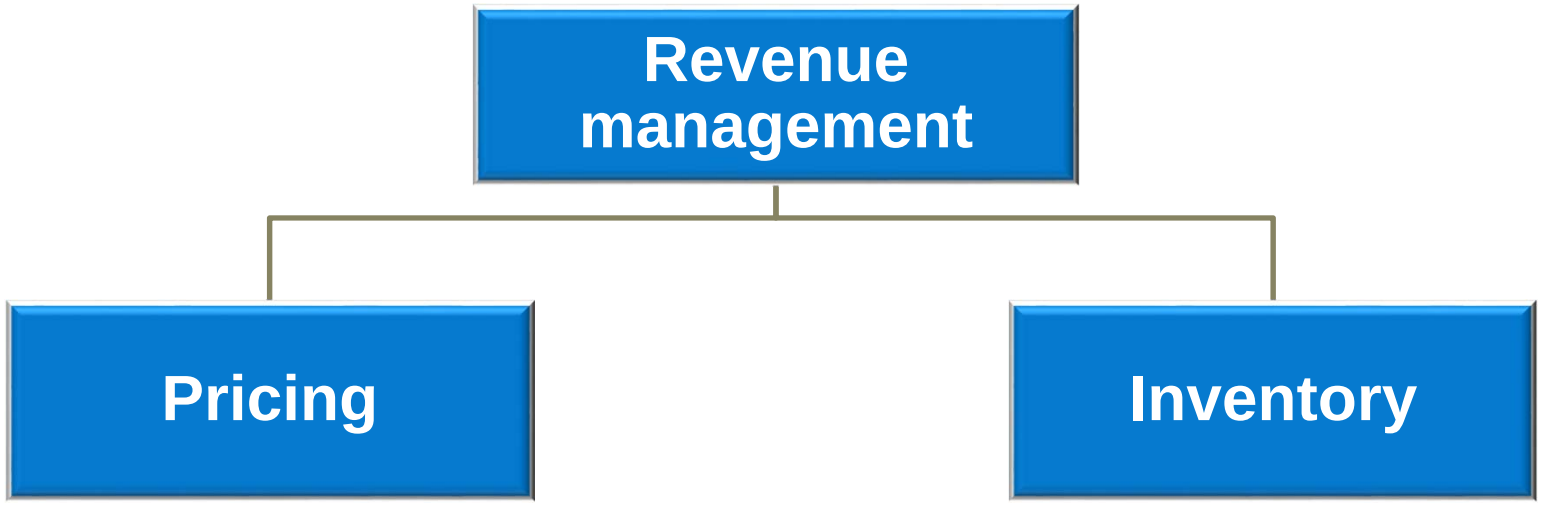
Core principles of revenue optimization

How are customers impacted by revenue management?

How does the revenue management process work?

Challenges and trends in revenue management

What is revenue management?



- Create overall pricing strategy based on cost and competition
- Determine fare levels (prices)
- Design fare rules to differentiate business vs. leisure customers
- Evaluate and respond to competitor fare/capacity changes

- Forecast high-fare vs. low-fare demand for each flight
- Decide how many seats to sell at each price according to demand
- Monitor demand on each flight and adjust fare availability to match
- Manage overbooking levels based on expected cancellations and no-shows

Why have revenue management?

Balance supply and demand with variable pricing

Protect seat inventory for the airline's most valuable customers

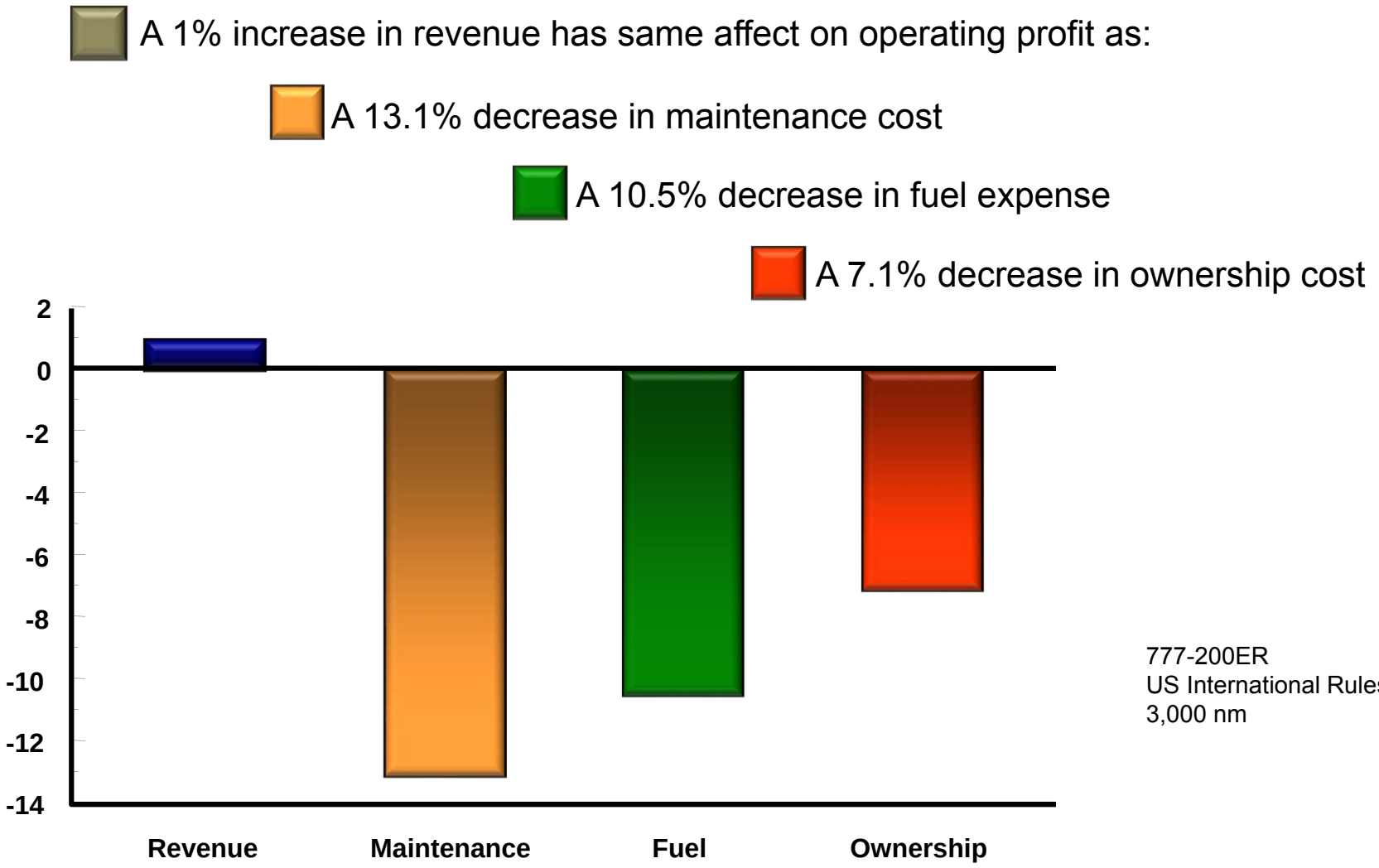
Stimulate demand on *(or shift to)* flights with excess capacity

Capture maximum possible revenue from each customer

Protect the airline's competitive position in a market

Ultimate goal:
Maximize revenue (minimize loss) on every flight!

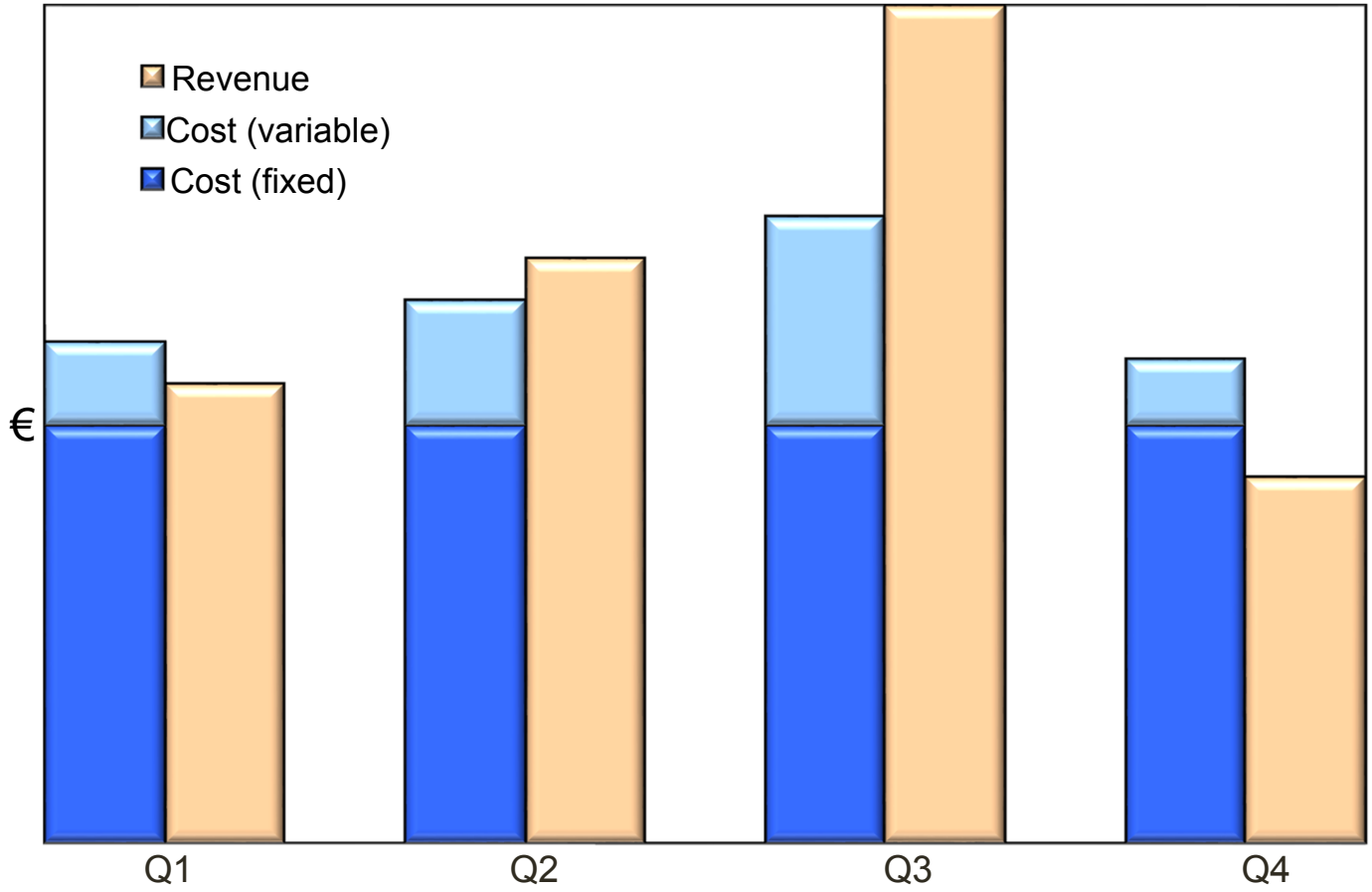
Revenue has a disproportionate impact on profitability



777-200ER
US International Rules
3,000 nm

An entire year's profit can be made *(or lost!)* in just one season

Sample Airline Profitability By Season



Revenue management is the core of the airline's revenue-generation chain

Fleet, network, & schedule planning
Builds strategic plan for airline growth
Search for new markets and opportunities

Sales, marketing, & loyalty (FFP)
Promote the product to customers
Develop relationships for market share and yield premium

Revenue management
Optimize revenue based on network / schedule
Find revenue opportunities & threats

Distribution
Make inventory available in every sales channel at lowest cost
Target offers to specific customers by segment & channel

Airport & onboard service
Deliver the expected product on every flight, every day
Create customer experience to drive new and repeat business

A revenue forecast & variances from plan create an early warning system

Warns of future revenue shortfalls

Allows the airline to take action through adjustments to pricing, distribution, promotions, or schedule

Identifies specific source(s) of revenue weakness

Which markets or points of sale?

Which seasons or days of week?

Evaluates impact of competitors' actions and strategies

Decision to match a competitor's fare reduction

Competitive capacity changes relative to total demand

Demand forecasts provide critical information for airline decisions

Identify revenue opportunity on each flight

Allows airline to keep seats available for late bookings (high-revenue customers)

Provide guidance for personnel and equipment planning during peak travel seasons

Revenue management uses forecasting to match pricing to demand by opening and closing fare classes

Maximize revenue by selectively accepting or rejecting reservation requests based on value relative to forecasted demand

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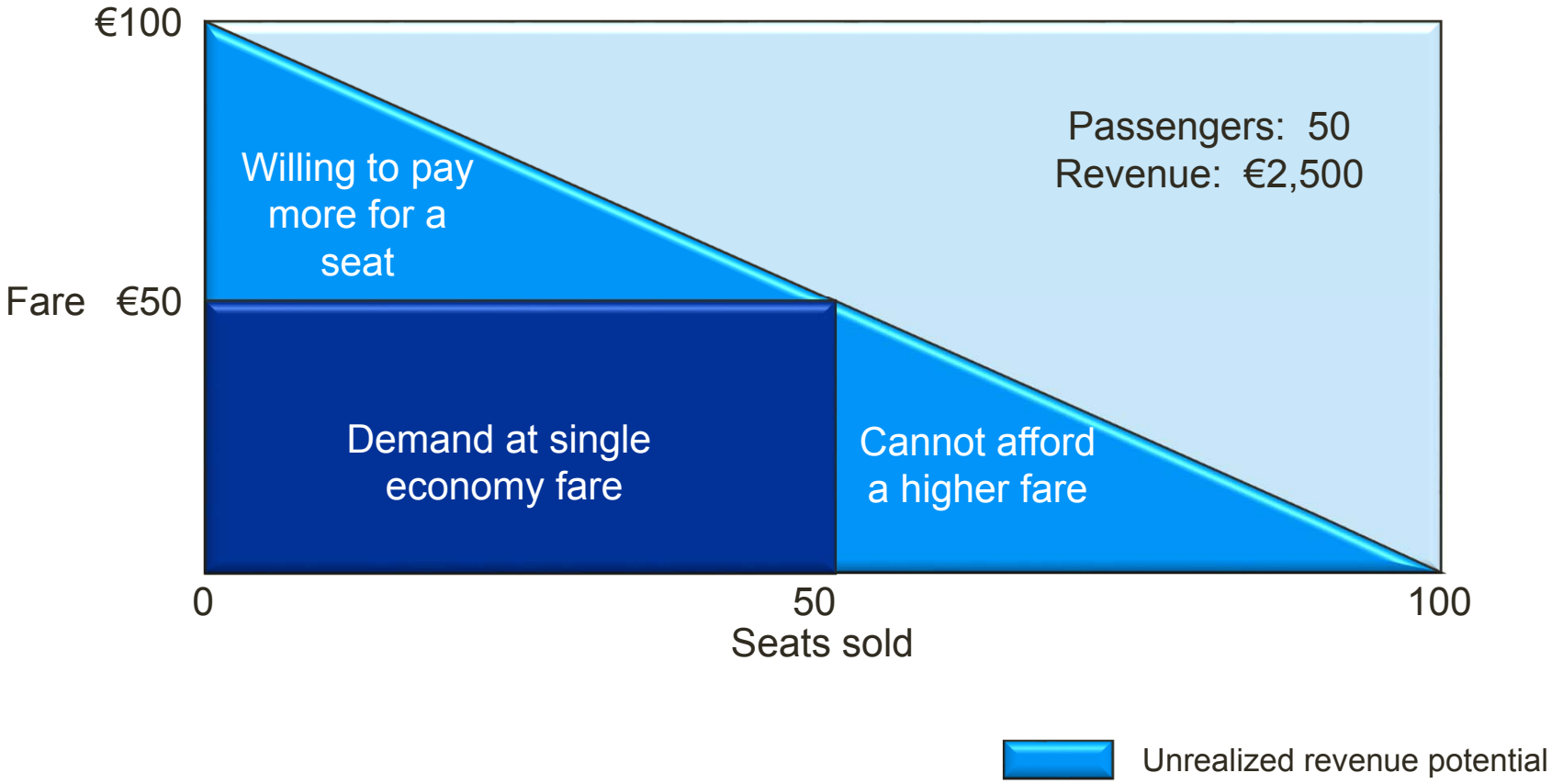
As price decreases, demand increases

Offering just one fare limits revenue potential



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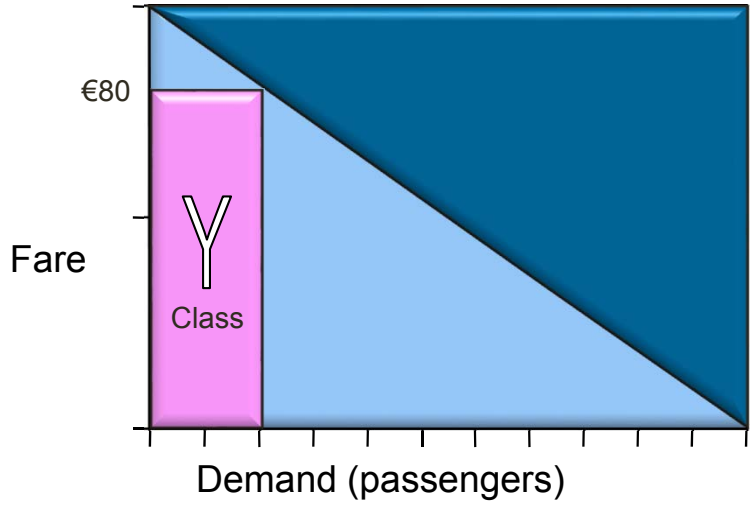
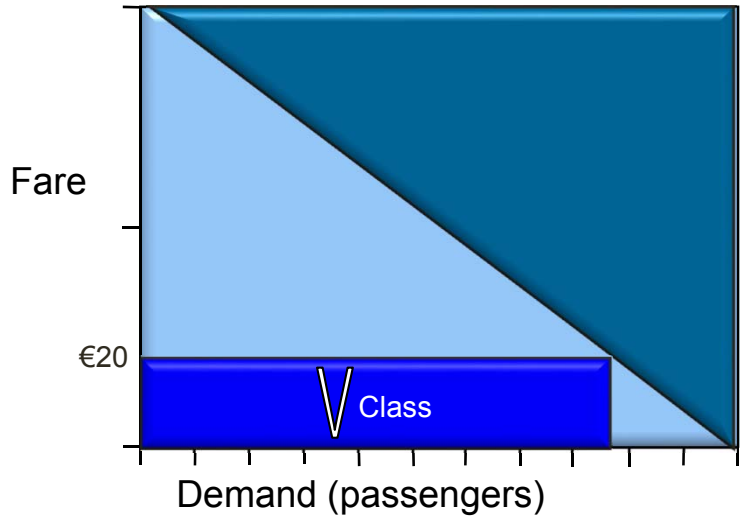


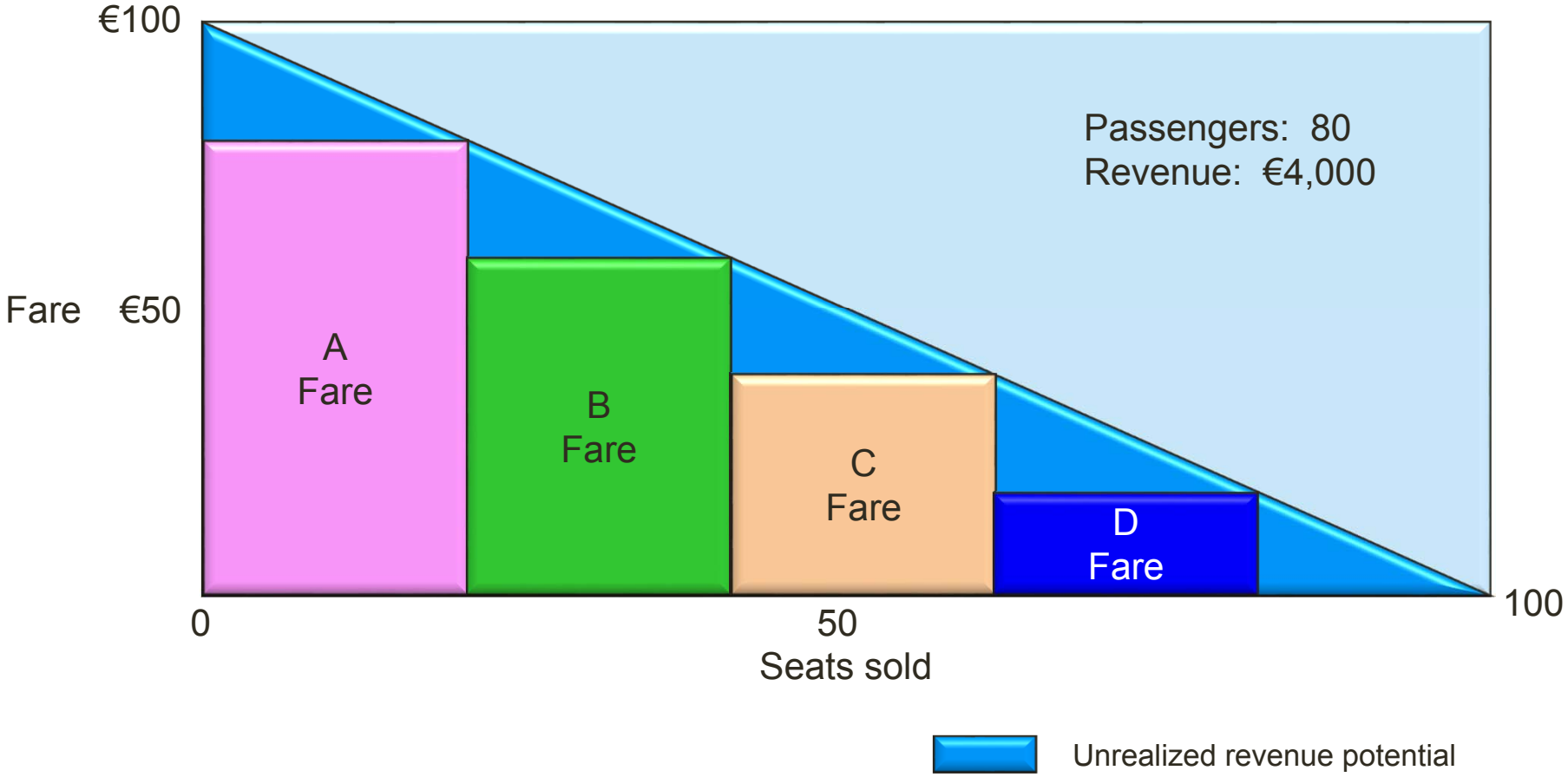
Extreme case 1	
Passengers:	20
Revenue:	€1,600
High RPK / yield Low load factor **Low revenue**	



Extreme case 2	
Passengers:	80
Revenue:	€1,600
Low RPK / yield High load factor **Low revenue**	

Unrealized revenue potential

Offering multiple fares is good for the airline *and* its customers



Price discrimination: Charging customers different prices for the same product

Based on willingness or ability to pay

Business customers can pay more for their travel

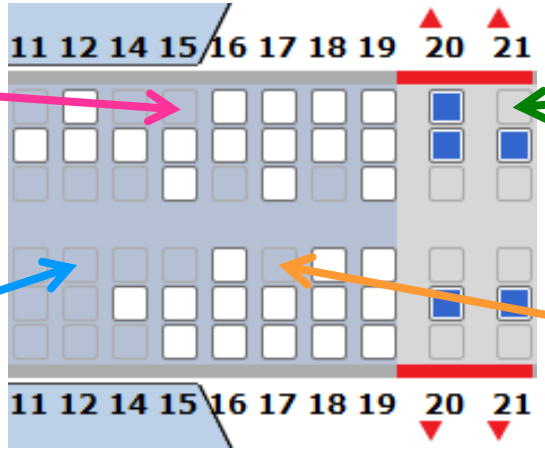
- The business customer must travel; the leisure customer wants to travel
- A third party (employer) is paying for their travel

Business ticket purchases are usually easy to detect

- Depart Sunday/Monday; return Thursday/Friday
- Buy tickets close to departure date
- Often change or cancel ticket *(need flexibility to do so without penalty)*

€751
Researcher traveling to speak at conference

€1,442
Once-in-a-lifetime trip to climb Mt. Everest



€2,095
Sales executive rushing to save critical order

€269
Weekend trip to visit friend

Price discrimination: Charging customers different prices for the same product

Many business models utilize price discrimination

Useful when fixed costs are high, marginal costs are low, and inventory is perishable or time-dependent

Hotels, rental cars, cruise lines

Cinema, concerts, etc.: Wednesday afternoon vs. Friday night

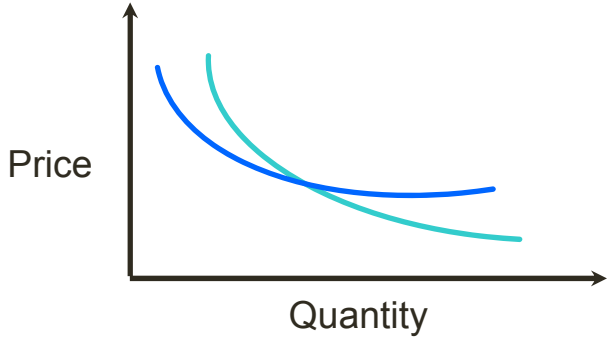
Pubs, nightclubs: happy hour, ladies' night

Universities: scholarships & other financial aid

Bakeries: "50% off all baked goods after 15:00"

Pricing strategies must be adapted to match the airline's environment

Elasticity



Cost structure

- Low costs are necessary to compete
- Many prices, same basic product

Competition

- Schedule / service quality
- Passenger preferences
- Market share

Market

- Economic activity
- Market development
- Passenger characteristics

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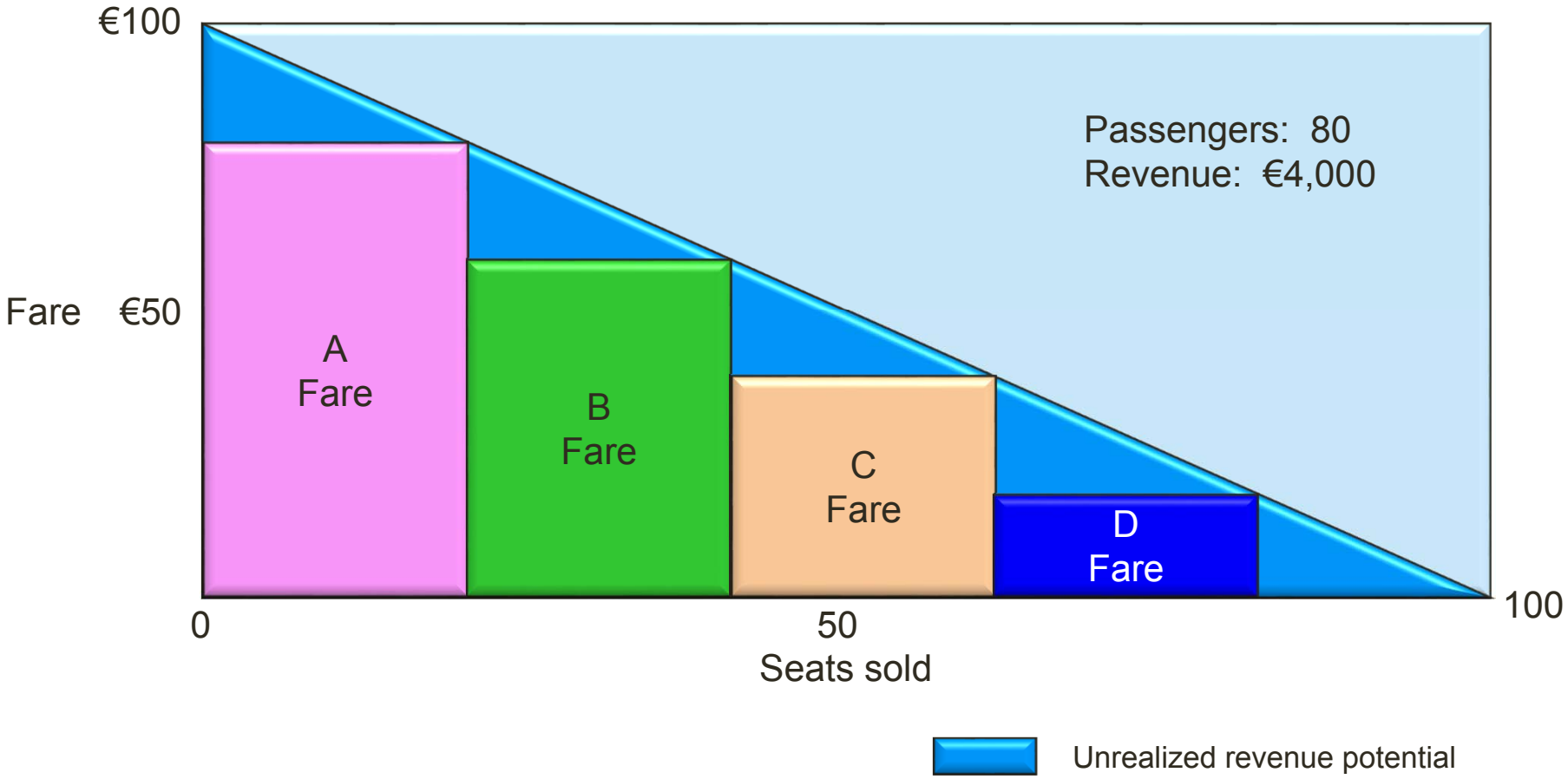
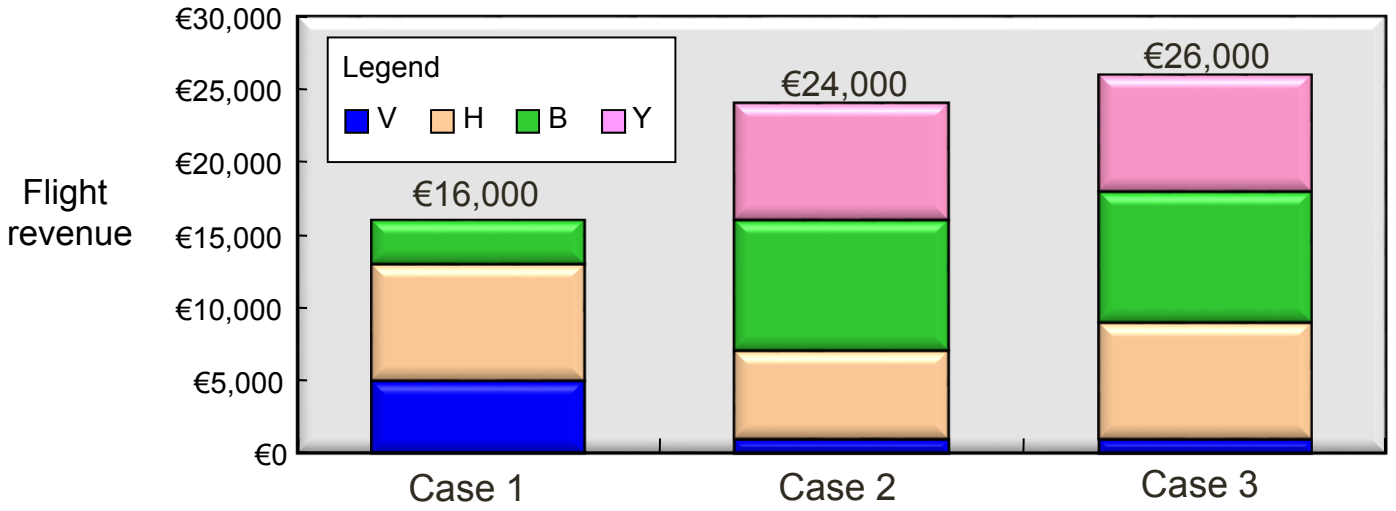


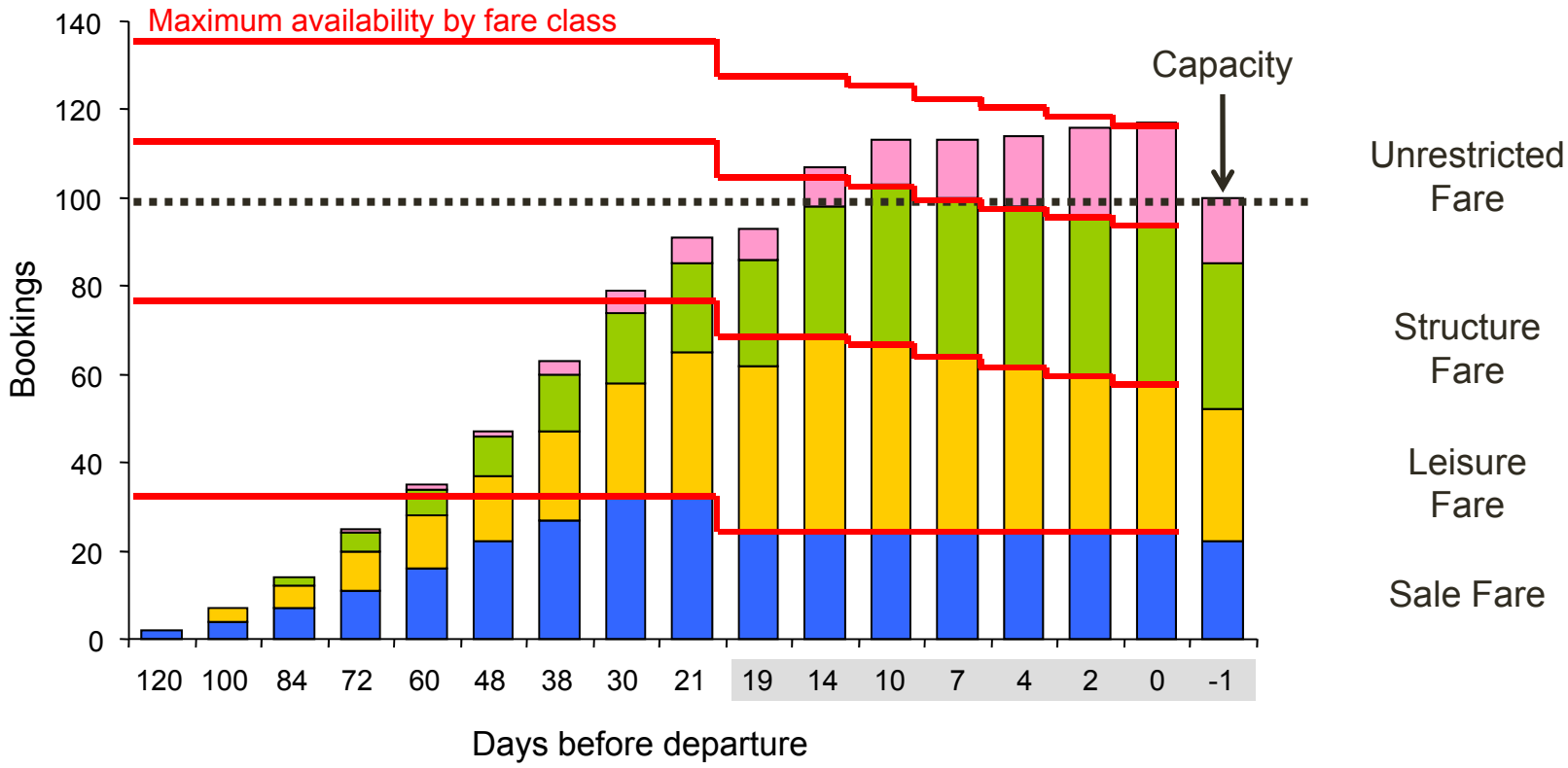
Optimizing fare class availability maximizes revenue



	Average fare	Unconstrained demand	Case 1	Case 2	Case 3
Y	€400	20	0	20	20
B	€300	30	10	30	30
H	€200	40	40	30	40
V	€100	50	50	10	10
Total passengers		140	100	90	100
Airplane capacity = 100					

Optimizing fare class availability maximizes revenue

Flight:	XX190
Leg:	AAA-BBB
Departure:	Friday, 26 Jun
Cabin:	Economy
Capacity:	000/100



Example: Protecting peak-flight inventory

Late Friday is a peak demand period for business travelers flying home, so afternoon and evening flights are reserved for higher-yield passengers

Flights at peak hours protected for higher fares

How does an airline decide whether to accept a booking?

A hypothetical case…

- "Getaway Airlines" has one seat left on a future flight
- The airline sells seats at two prices: €275 & €650
- A passenger calls desiring a €275 ticket for a flight

Decision:

Should the airline …

a) Accept the €275 booking, or
b) Refuse the booking in hopes of selling the same seat to a €650 passenger?

How does an airline decide whether to accept a booking?

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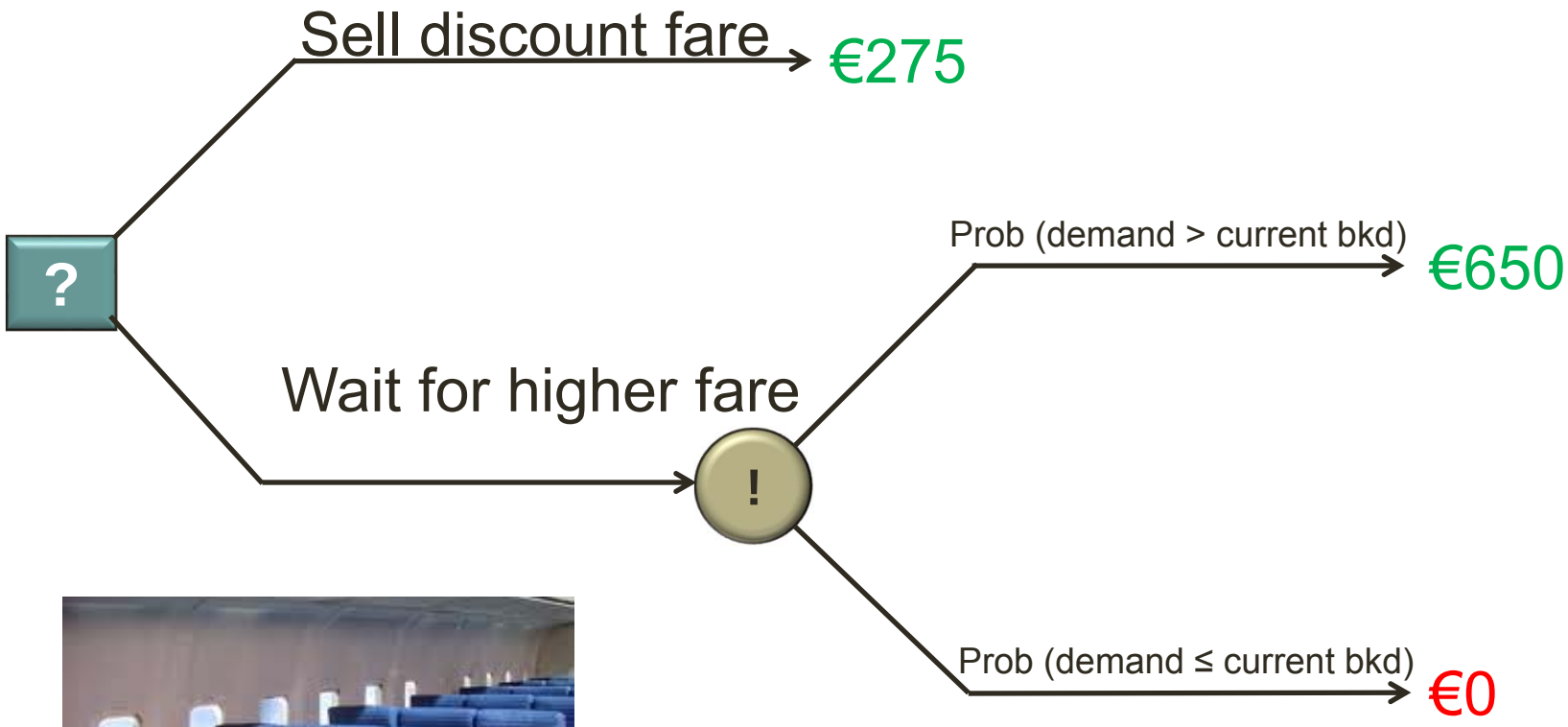
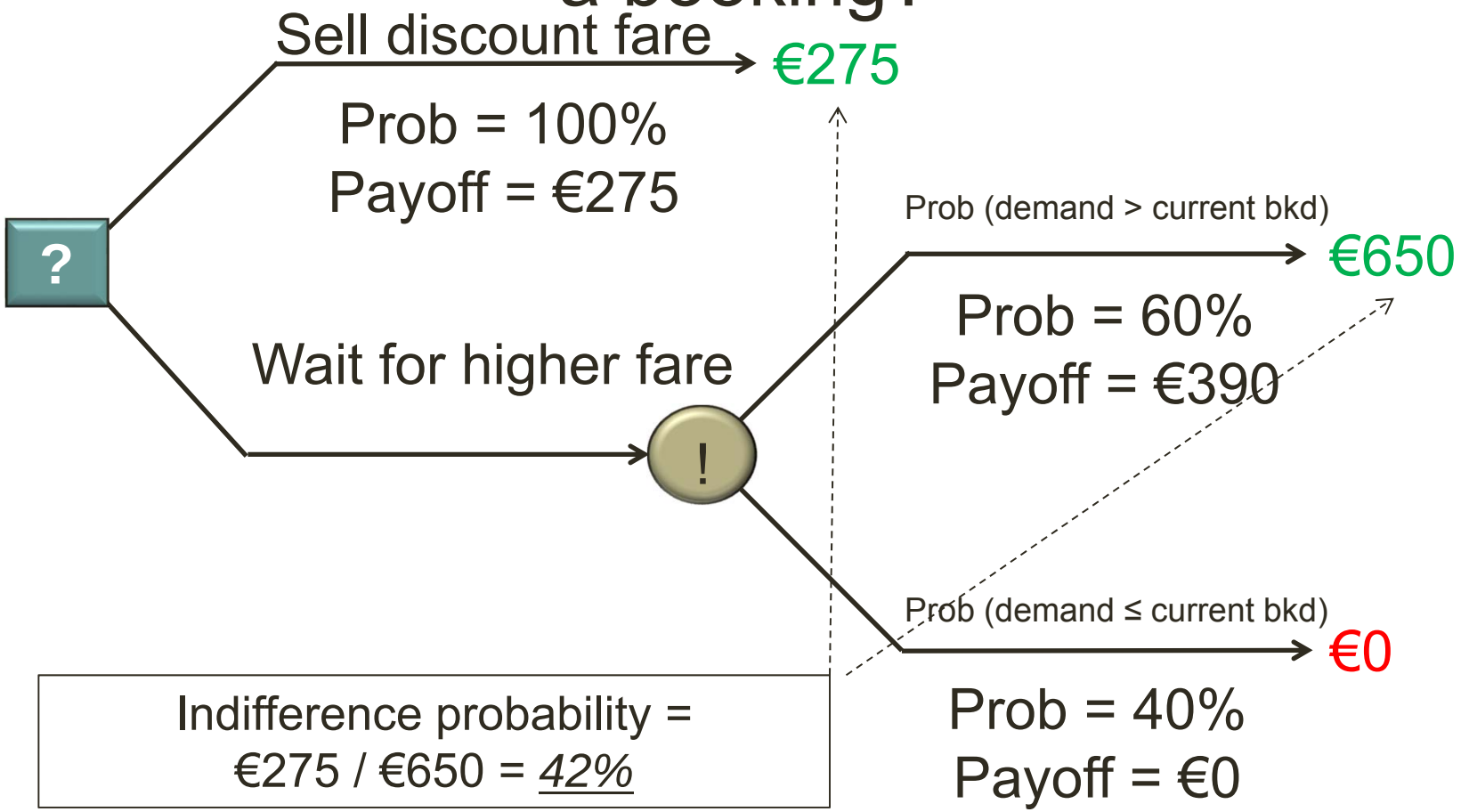


How does an airline decide whether to accept a booking?



If the probability of a €650 booking > 42%, then the expected payoff of waiting is higher and we should refuse the €275 booking

When is revenue management most effective?

Flights with high demand

Limit lower-fare availability to protect seats for higher-fare customers

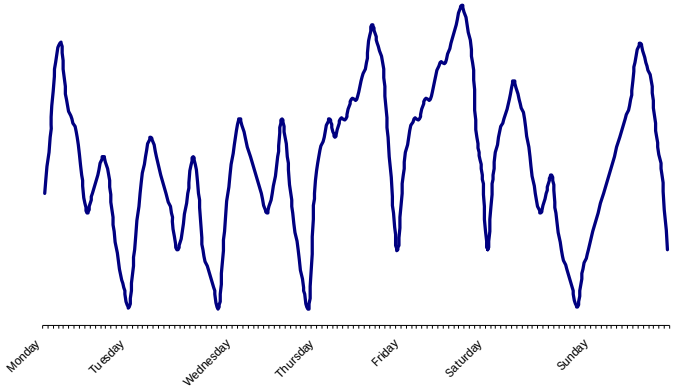
Normal peak travel periods or special events

Sun/Mon/Thu/Fri for business markets

Weekends for leisure destinations

Holidays / school vacations

Special events with large groups
(conferences, sporting events, etc.)



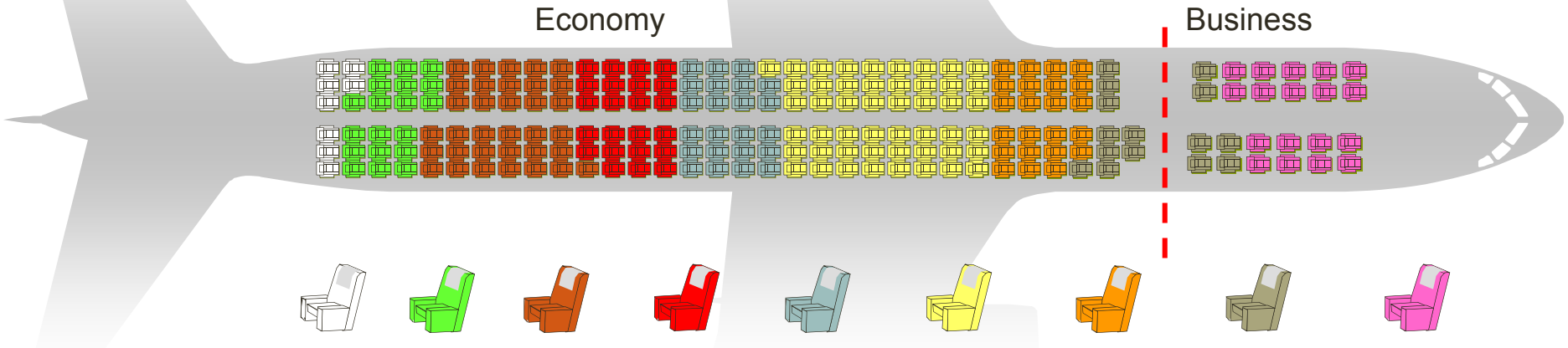
On low-demand flights, customers with higher willingness to pay are "sold up" to higher fares by pricing rules

Advance purchase requirement

Saturday night or minimum stay at destination

Ability to change/cancel without penalty

End result: Booking data shows customers segmented, revenue maximized

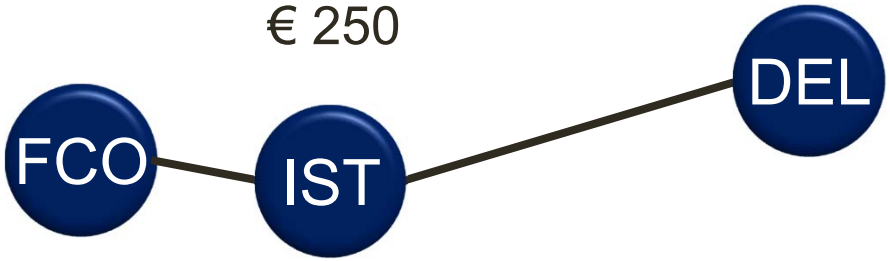


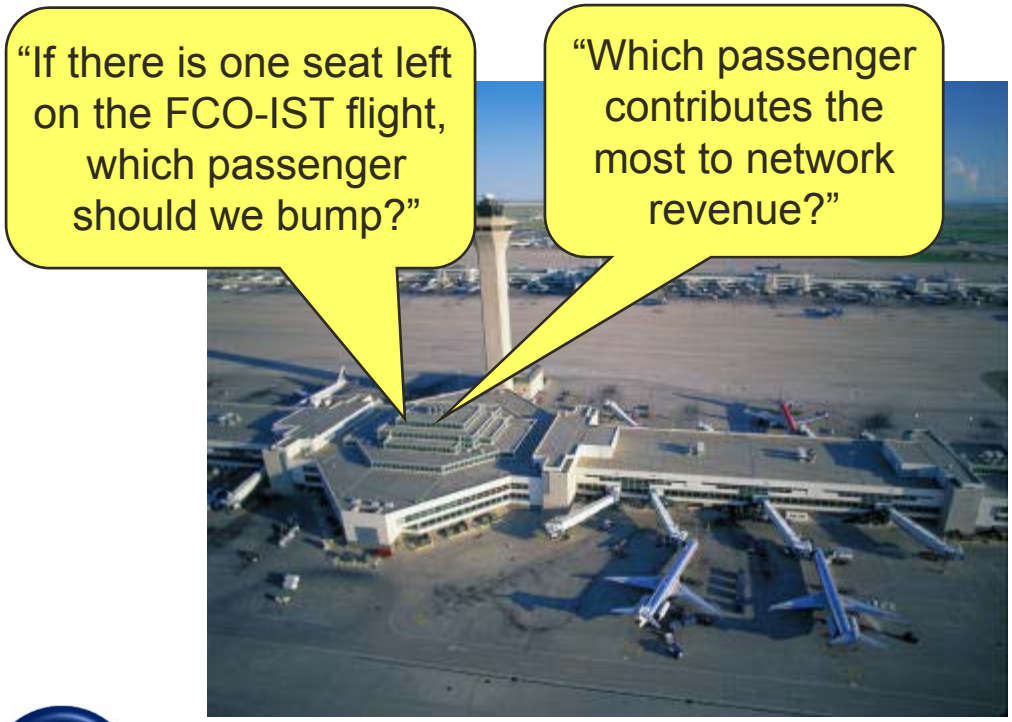
Fare class	Unsold	X	L	V	H	B	Y	C	J
Fare range	--	0	€100-€199	€200-€399	€400-€599	€600-€799	€800-€999	€1,000-€1,999	€2,000+
Average fare	--	0	€162	€324	€541	€758	€974	€1,624	€2,707
Passengers	8 *(empty)*	19	34	23	23	49	23	15	18
Load factor	4%	9%	16%	11%	11%	23%	11%	7%	8%
Revenue	--	€0	€5,523	€7,473	€12,455	€37,147	€22,418	€24,368	€48,735
Avg. advance purchase *(days)*	--	--	65	46	35	32	26	11	6

Focus on total network revenue, not just leg revenue

Passenger 1
Full fare Y, FCO-IST
€ 100

Passenger 2
Discounted Y, FCO-DEL
€ 250



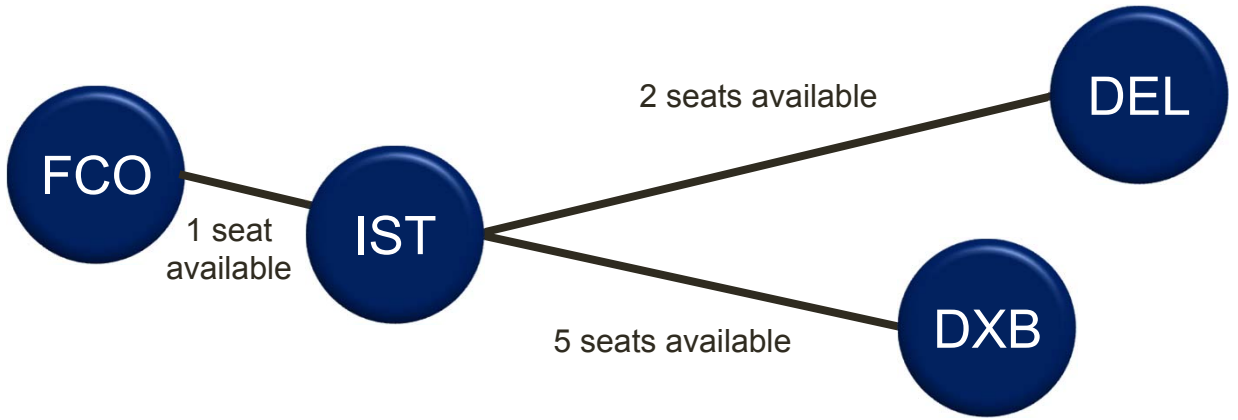


A revenue-optimal passenger mix balances long and short-haul demand, while maintaining the appropriate level of discount-fare availability

In this simplified network, which passengers should we accept to maximize revenue?

Assume that demand is certain and no connection costs exist

What is your total revenue?



O&D	Fare	Remaining Demand	Accepted Passengers
FCO-IST	€100	1	
IST-DXB	€200	2	
IST-DEL	€225	2	
FCO-DEL	€250	1	
FCO-DXB	€205	1	
Total Accepted			

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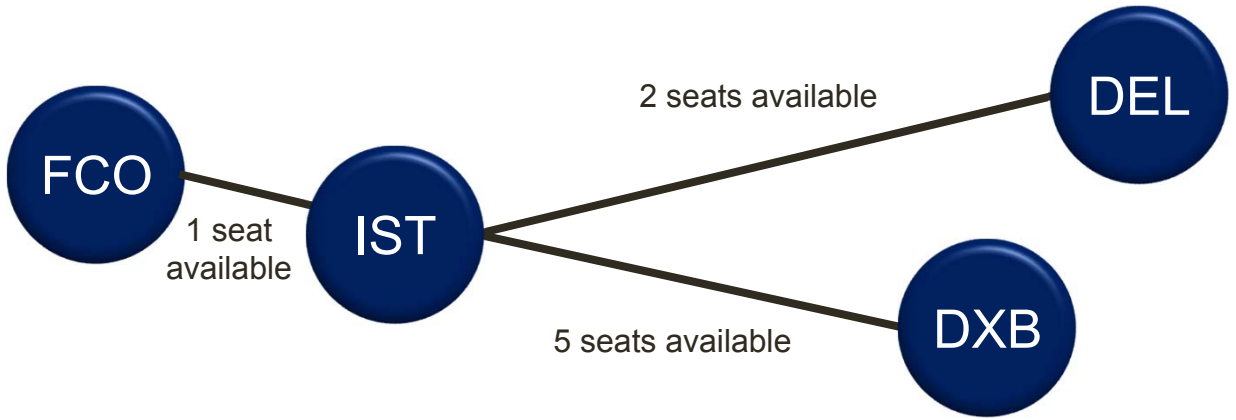

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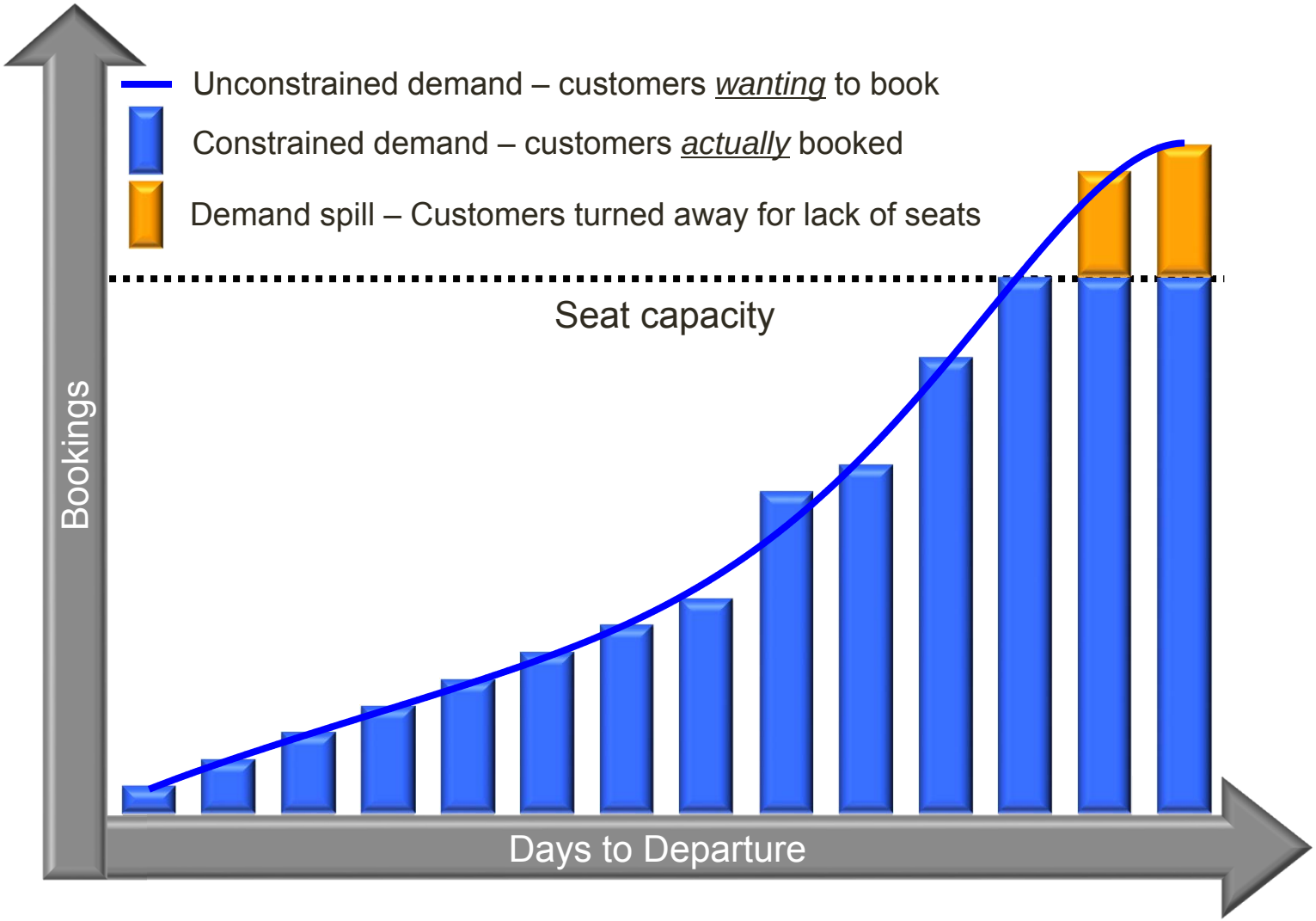
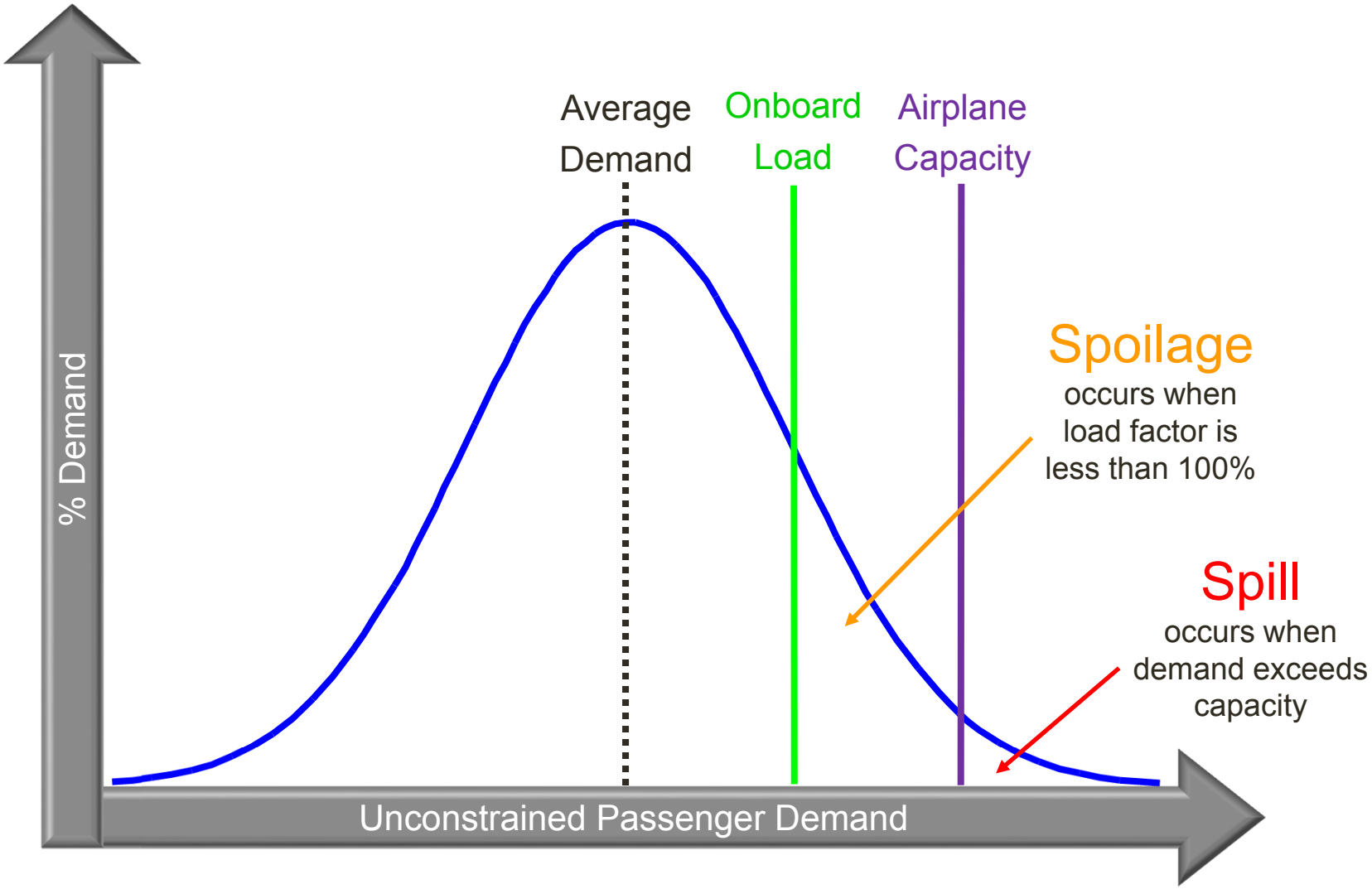
IST-DEL	€225	2	2
FCO-DEL	€250	1	
FCO-DXB	€205	1	1
Total Accepted	**€1055**		**5**

Passenger demand profile



Concepts: Spill and spoilage



Concepts: Spill and spoilage

Spill is demand that was turned away because:

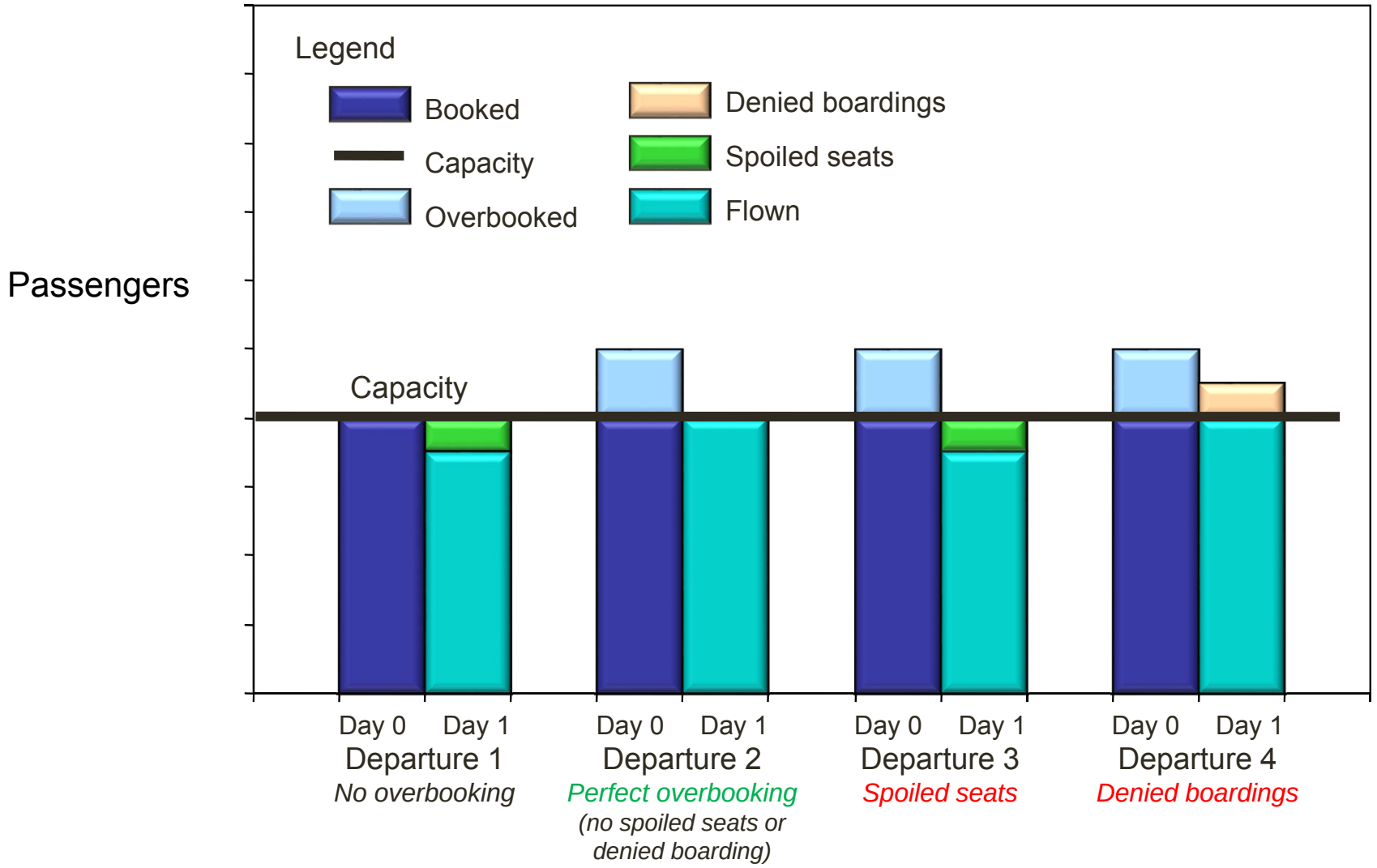
- Seats were not offered at a fare a customer was willing to pay
- The flight was sold out when the customer was attempting to book

Spoilage is seats left unsold at departure time because:

- Not enough seats were offered at discount fares
- Too many seats were held back for higher-yield customers
- Customers booked seats but later canceled or no-showed

Optimal revenue management requires a careful balance between spill and spoilage

Minimize spoilage due to no-shows & cancellations with overbooking



The cost of overbooking: “bumped” passengers

Denied boardings will occur because of volatility in no-show rates; forecasts are rarely 100% accurate

Existence of denied boardings does not mean the system has failed

Some denied boardings are desirable – otherwise unnecessary spoilage occurs

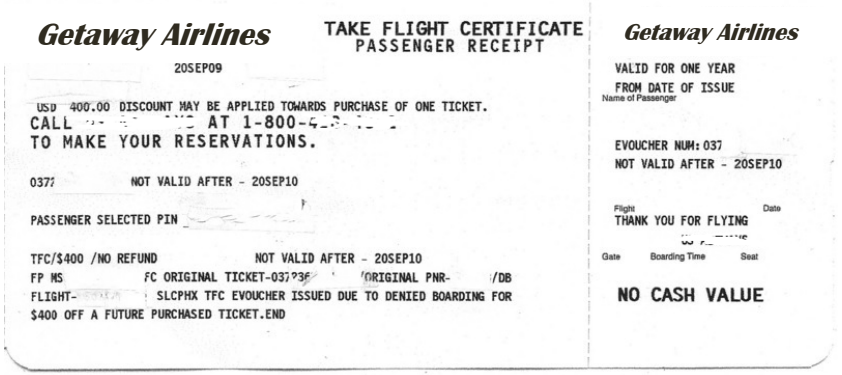
Overbooking brings additional costs, which should be considered when determining optimal overbook rates

Denied boarding compensation

Alternate transportation

Hotel and meal vouchers

Customer goodwill


Getaway Airlines
TAKE FLIGHT CERTIFICATE
PASSENGER RECEIPT
20SEP09
USD 400.00 DISCOUNT MAY BE APPLIED TOWARDS PURCHASE OF ONE TICKET.
CALL [illegible] AT 1-800-[illegible]
TO MAKE YOUR RESERVATIONS.
037[illegible] NOT VALID AFTER - 20SEP10
PASSENGER SELECTED PIN [illegible]
TFC/$400 /NO REFUND NOT VALID AFTER - 20SEP10
FP MS [illegible] FC ORIGINAL TICKET-037[illegible] ORIGINAL PNR- /DB
FLIGHT- [illegible] SLCPHX TFC EVOUCHER ISSUED DUE TO DENIED BOARDING FOR
$400 OFF A FUTURE PURCHASED TICKET.END
Getaway Airlines
VALID FOR ONE YEAR
FROM DATE OF ISSUE
Name of Passenger
EVOUCHER NUM: 037
NOT VALID AFTER - 20SEP10
Flight Date
THANK YOU FOR FLYING
Gate Boarding Time Seat
NO CASH VALUE

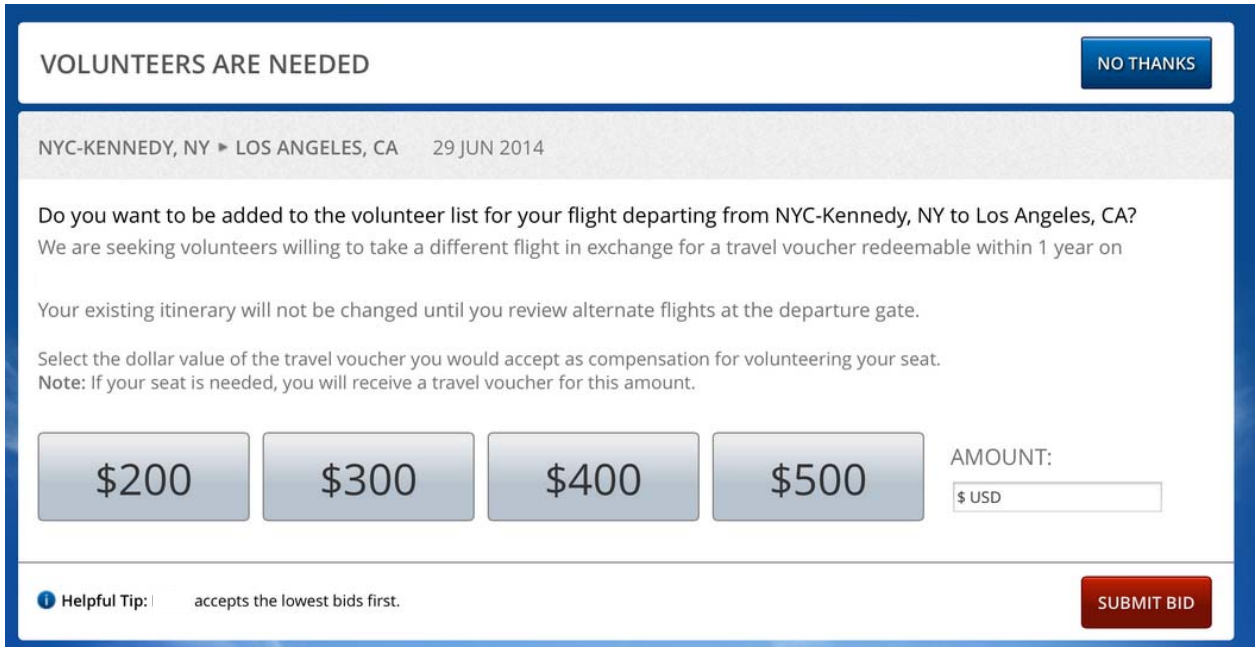
… but the revenue benefit of overbooking should outweigh these costs!

The cost of overbooking: “bumped” passengers

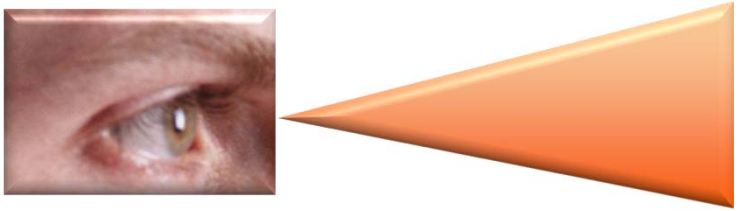
When a flight is overbooked, ask customers at check-in to volunteer for a later flight … and offer them enough compensation to make it worthwhile!

This reduces gate delays and builds customer goodwill

Ensure that all denied boardings *(voluntary or involuntary)* are reported to improve future no-show forecasts



Successful airlines focus on maximizing revenue per available seat-kilometer (RASK)



$$\text{Load factor} = \frac{\text{Total passengers flown}}{\text{Total available seats}}$$

$$\text{RASK} = \frac{\text{Total passenger revenue}}{\text{Available seat kilometers}}$$

Revenue per available seat-kilometer

$$\text{Yield} = \frac{\text{Total passenger revenue}}{\text{Revenue passenger kilometers}}$$

Revenue per passenger-kilometer

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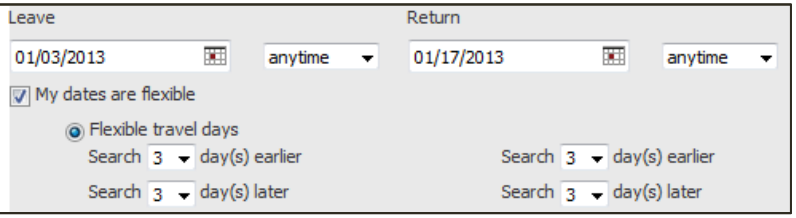
Customers see revenue management at work when they shop for airline tickets

Higher (lower) fares available during peak (off-peak) days and times

Airlines target flexible (low-yield) customers with “search +/- __ days” option on website



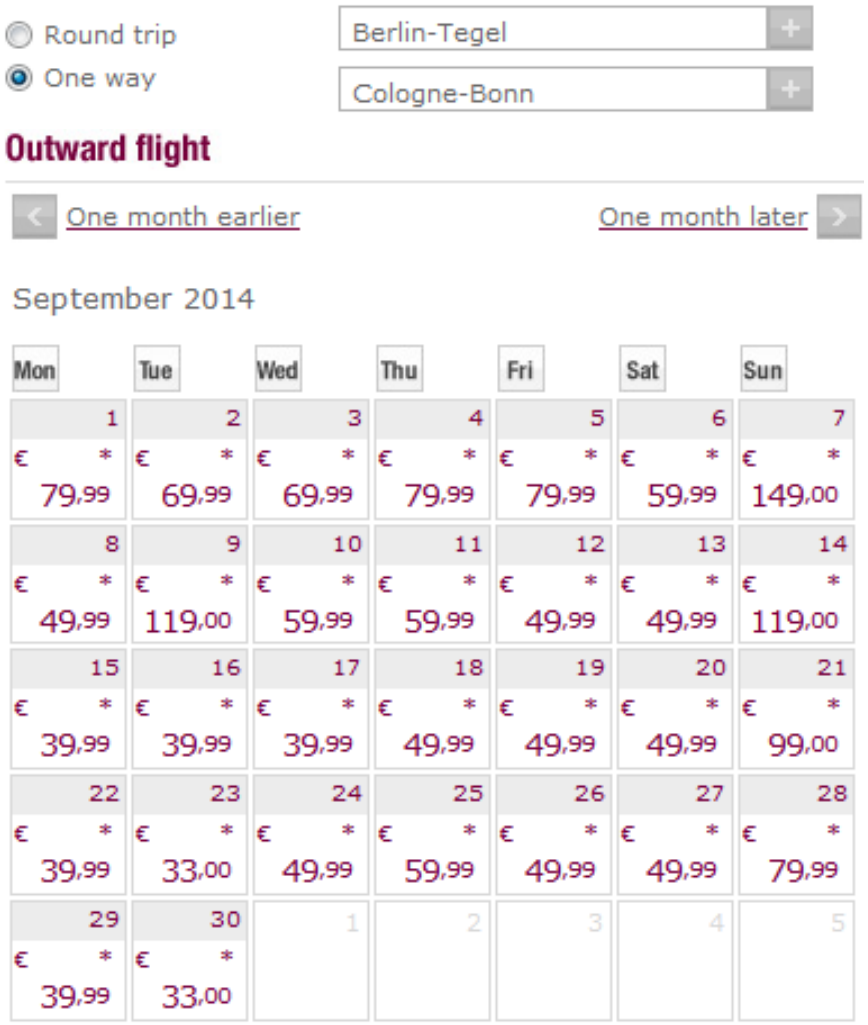
Vacation-package providers and consolidators sell seats the airline does not expect to be able to sell at higher fares

“Opaque” travel sites hide airline name and schedule until booking is complete

Discounted fares for large groups; airline trades higher yield for reduced spoilage risk

Revenue management is key to the success of both low-cost and network carriers

Low fares available on off-peak dates; peak flights protected for higher fares



Revenue management is key to the success of both low-cost and network carriers

How is this an example of effective revenue management?

Op.	Flights	Depart	Arrive	Aircraft	Duration	Connections	Economy		
							Tango	Flex	Latitude
Direct Flights									
	AC108	07:00	14:26	321	4hr26		-	$416	$1007
	AC142	08:00	15:26	333	4hr26		-	$454	$1007
	AC034	09:00	16:23	77L	4hr23		-	$497	$1007
	AC116	10:00	17:26	321	4hr26		-	$497	$1007
	AC1176	11:30	18:56	763	4hr26		-	$577	$1007
	AC180	12:00	19:26	319	4hr26		-	$577	$1007
	AC132	12:30	19:56	320	4hr26		-	$416	$1007
	AC1136	13:15	20:38	77W	4hr23		$351	$416	$1007
	AC102	14:15	21:38	77W	4hr23		$351	$416	$1007
	AC148	15:00	22:26	320	4hr26		-	$588	$1018
	AC100	16:00	23:26	319	4hr26		-	$454	$1007
	AC152	17:30	00:56 + 1 day	320	4hr26		$351	$416	$1007
	AC156	22:30	05:56 + 1 day	321	4hr26		$351	$416	$1007
	AC162	23:15	06:41 + 1 day	321	4hr26		$351	$416	$1007
	AC1172	23:55	07:21 + 1 day	320	4hr26		$351	$416	$1007

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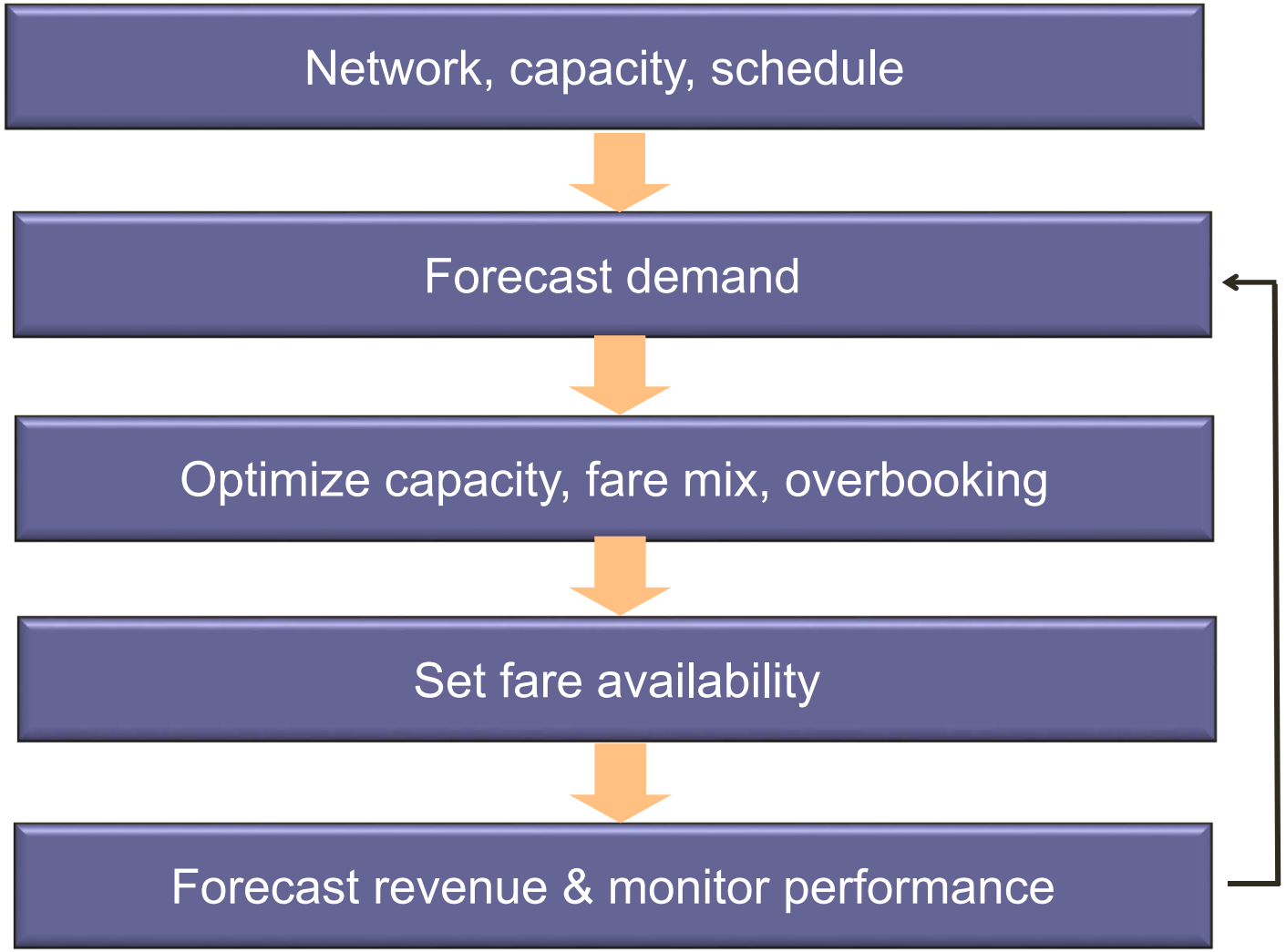
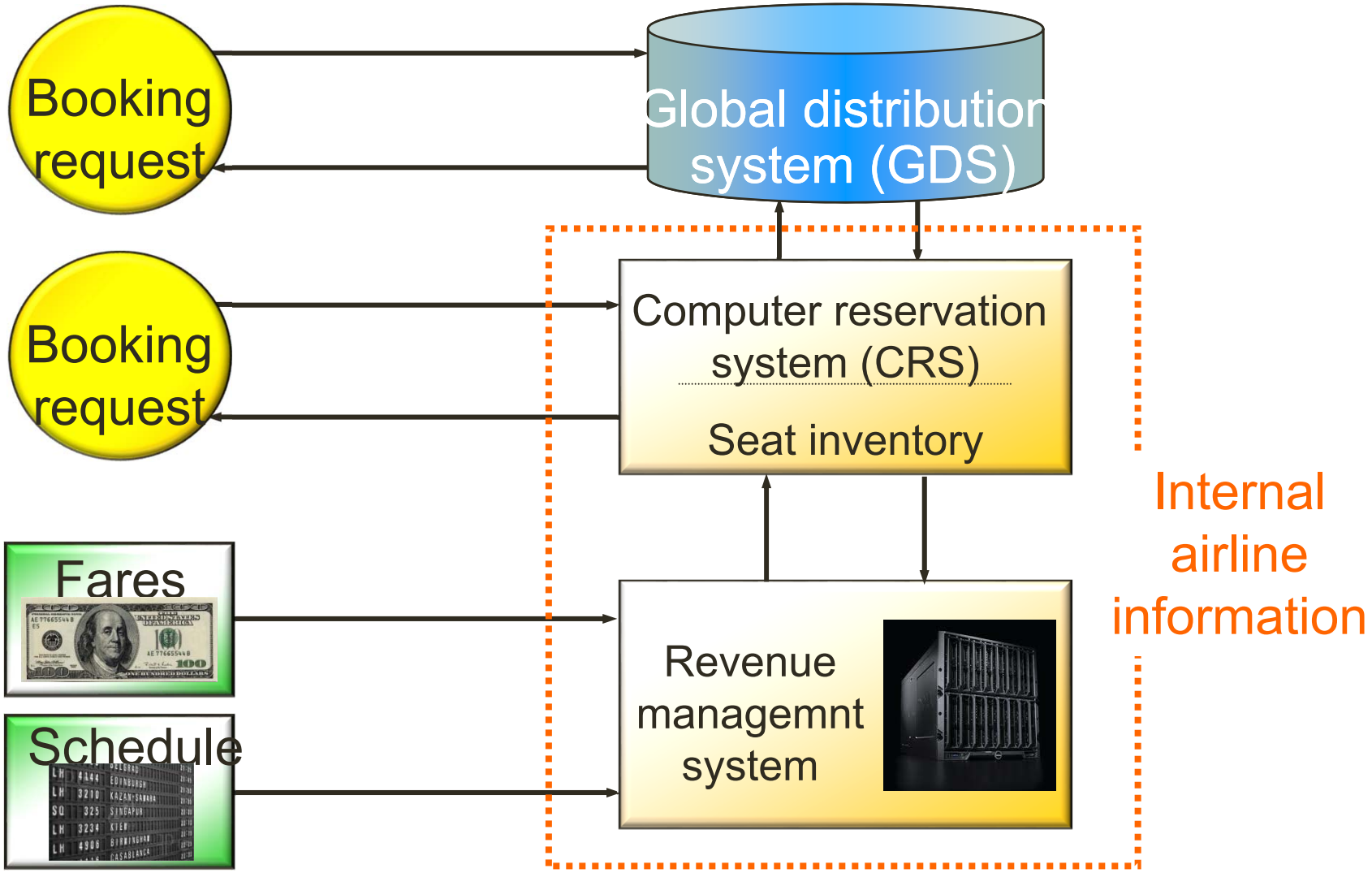
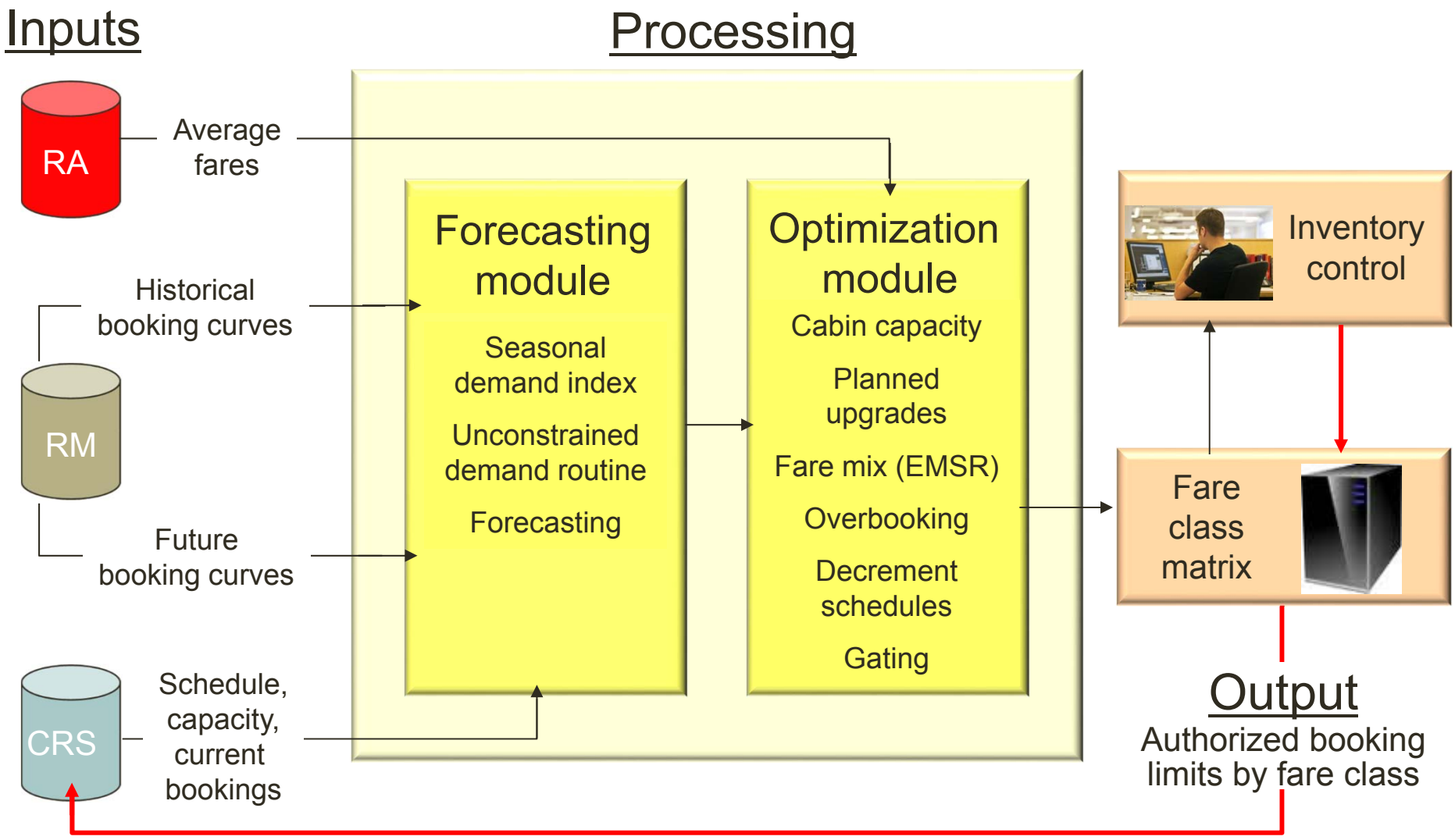
Revenue management process



Revenue management – transaction flow

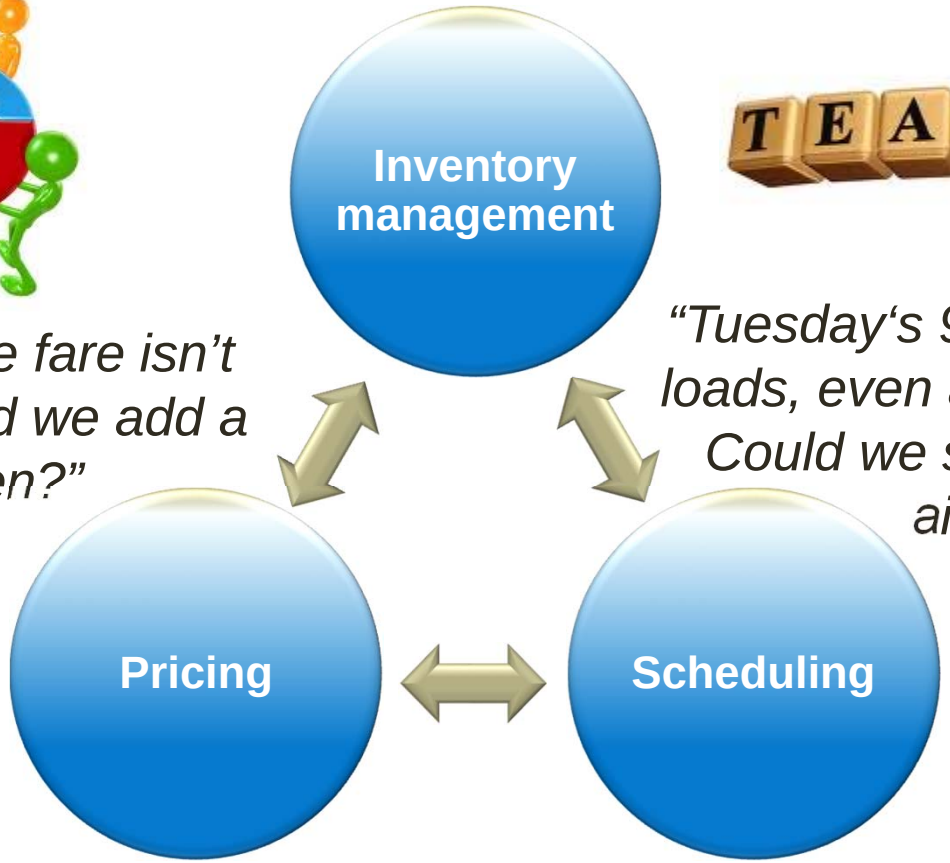


Revenue management – application sequencing



Pricing, inventory management, and scheduling should give each other continuous feedback …

"Our normal leisure fare isn't selling well … could we add a sale fare then?"



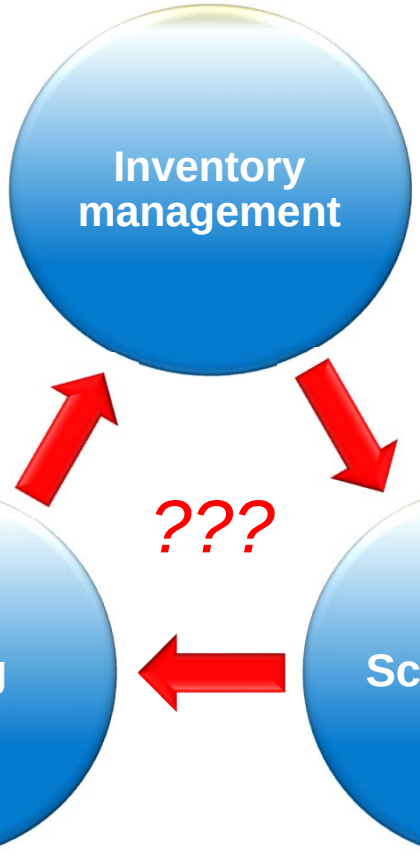
"Tuesday's 9:00 flight has poor loads, even at our lowest fares. Could we swap in a smaller airplane?"

"We're adding another Paris flight, but the new arrival time is not attractive; could we file a new fare for the eastbound leg?"

… and should be *jointly* accountable for market / network revenue performance

Otherwise, the result is a never-ending "blame game"…

"Inventory management never opens the lowest fare classes when we file sale fares!"



"Scheduling always puts in too much capacity!"

"Our analysis clearly showed enough demand for this additional flight! Pricing just can't file the right fares…"

Airline Revenue Management – Overview

Why is revenue management important?

How do economic concepts drive revenue management?

Core principles of revenue optimization

How are customers impacted by revenue management?

How does the revenue management process work?

Challenges and trends in revenue management

Revenue management complexity is increasing

More computing power = more precise demand forecasts

Forecasts based on passenger attributes, seasonality, etc.

Managing interacting demand between fare classes (e.g., class nesting)

Fare class availability moving from leg/segment to O&D-based

- Balance local vs. connecting fare mix to maximize network revenue
- Increase connections between alliance partners

Joint RM controls between alliance members with antitrust immunity

Example: Sharing bid-price data on immunized joint-venture flights

Revenue management is becoming more difficult

Historically, most airlines segmented business and leisure travel demand using fare rules

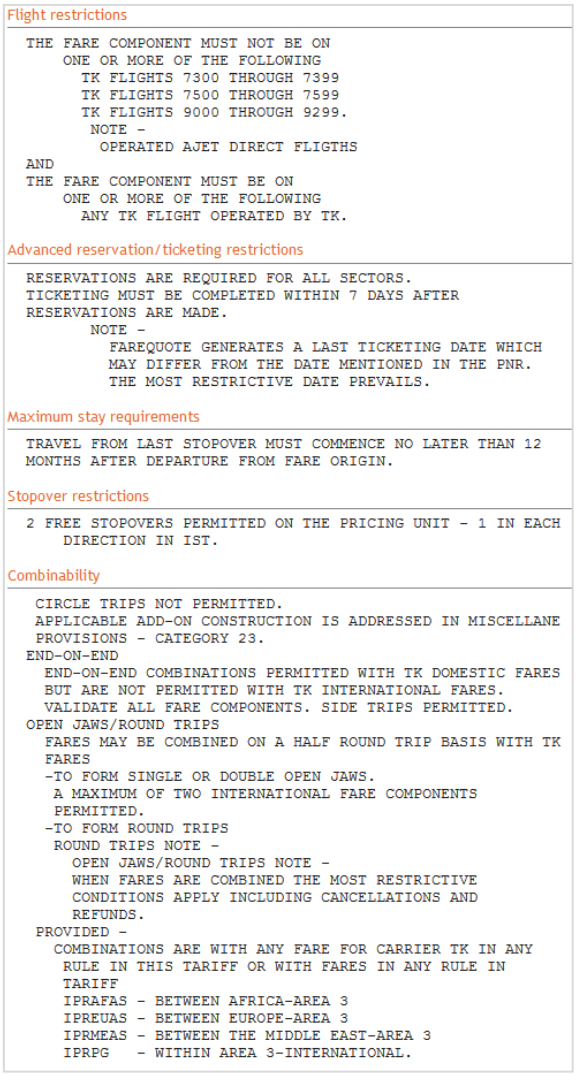
Refundable fare

Day of week / seasonal fare validity

Advance-purchase requirement

Shrinking budgets force some business travelers to adopt leisure traveler purchase patterns, making fare rules less effective

Low-cost carriers often use “no-rules” fares to stimulate demand and increase market share



Flight restrictions

```
THE FARE COMPONENT MUST NOT BE ON
    ONE OR MORE OF THE FOLLOWING
      TK FLIGHTS 7300 THROUGH 7399
      TK FLIGHTS 7500 THROUGH 7599
      TK FLIGHTS 9000 THROUGH 9299.
       NOTE -
        OPERATED AJET DIRECT FLIGTHS
AND
THE FARE COMPONENT MUST BE ON
    ONE OR MORE OF THE FOLLOWING
      ANY TK FLIGHT OPERATED BY TK.
```

Advanced reservation/ticketing restrictions

```
RESERVATIONS ARE REQUIRED FOR ALL SECTORS.
TICKETING MUST BE COMPLETED WITHIN 7 DAYS AFTER
RESERVATIONS ARE MADE.
       NOTE -
         FAREQUOTE GENERATES A LAST TICKETING DATE WHICH
         MAY DIFFER FROM THE DATE MENTIONED IN THE PNR.
         THE MOST RESTRICTIVE DATE PREVAILS.
```

Maximum stay requirements

```
TRAVEL FROM LAST STOPOVER MUST COMMENCE NO LATER THAN 12
MONTHS AFTER DEPARTURE FROM FARE ORIGIN.
```

Stopover restrictions

```
2 FREE STOPOVERS PERMITTED ON THE PRICING UNIT - 1 IN EACH
    DIRECTION IN IST.
```

Combinability

```
  CIRCLE TRIPS NOT PERMITTED.
  APPLICABLE ADD-ON CONSTRUCTION IS ADDRESSED IN MISCELLANE
  PROVISIONS - CATEGORY 23.
END-ON-END
  END-ON-END COMBINATIONS PERMITTED WITH TK DOMESTIC FARES
  BUT ARE NOT PERMITTED WITH TK INTERNATIONAL FARES.
  VALIDATE ALL FARE COMPONENTS. SIDE TRIPS PERMITTED.
OPEN JAWS/ROUND TRIPS
  FARES MAY BE COMBINED ON A HALF ROUND TRIP BASIS WITH TK
  FARES
  -TO FORM SINGLE OR DOUBLE OPEN JAWS.
   A MAXIMUM OF TWO INTERNATIONAL FARE COMPONENTS
   PERMITTED.
  -TO FORM ROUND TRIPS
   ROUND TRIPS NOTE -
     OPEN JAWS/ROUND TRIPS NOTE -
     WHEN FARES ARE COMBINED THE MOST RESTRICTIVE
     CONDITIONS APPLY INCLUDING CANCELLATIONS AND
     REFUNDS.
 PROVIDED -
   COMBINATIONS ARE WITH ANY FARE FOR CARRIER TK IN ANY
    RULE IN THIS TARIFF OR WITH FARES IN ANY RULE IN
    TARIFF
    IPRAFAS - BETWEEN AFRICA-AREA 3
    IPREUAS - BETWEEN EUROPE-AREA 3
    IPRMEAS - BETWEEN THE MIDDLE EAST-AREA 3
    IPRPG   - WITHIN AREA 3-INTERNATIONAL.
```

Internet enables comparison shopping, drives customers to more costly booking channels

- **Increases difficulty of maximizing revenue capture**
- **Reinforces customer perception that travel is a commodity, which pushes airlines into destructive "price taker" behavior**
- **Price transparency allows competing airlines to observe each other's strategies**

	Etihad Airways	Emirates	Turkish Airlines	China Eastern	Qatar Airways	Air China	Aeroflot	Multiple Airlines	Finnair	Alitalia	Air France	Austrian Airlines
All flights												
Nonstop	--	--	--	--	--	--	--	--	--	--	--	--
1 stop	From £727	From £822	From £908	From £978	--	From £1,078	From £1,082	From £1,123	From £1,231	From £1,287	From £1,342	From £1,345
2 stops	--	--	--	--	From £1,041	--	--	From £1,492	--	--	--	--

Reduce transparency and lower distribution costs with “unbundling” of airline products

Many airlines are “unbundling” the travel experience into pieces that customers can buy separately

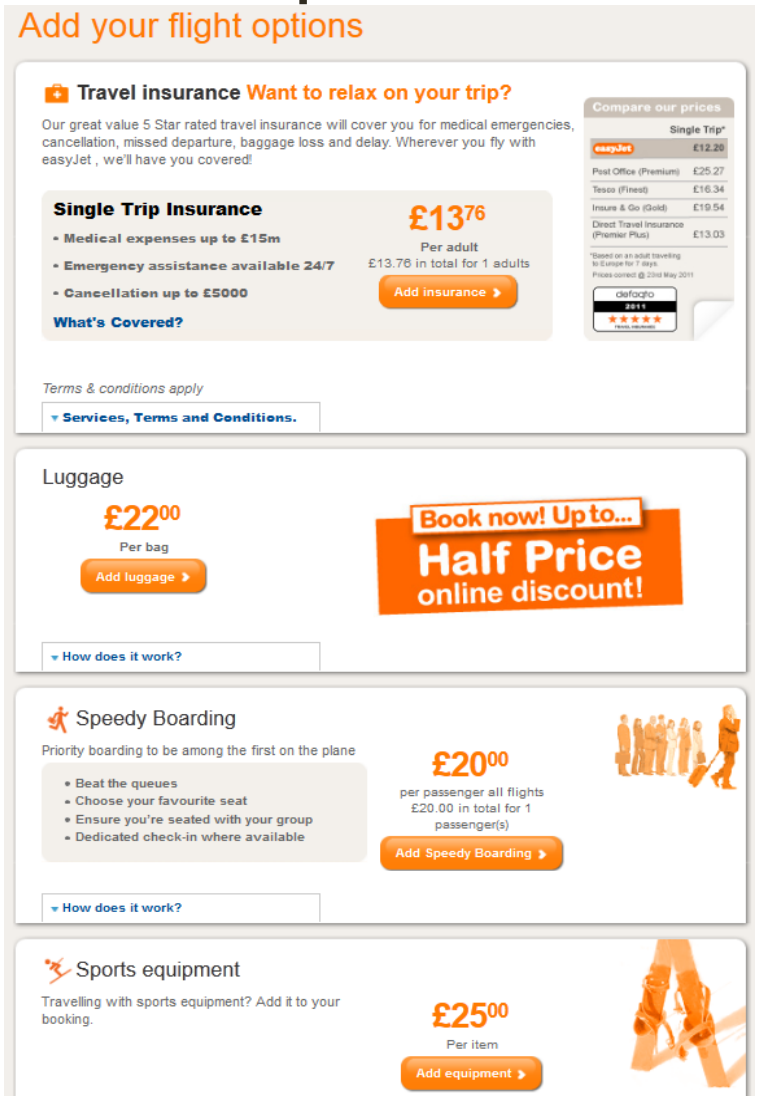
Checked bags

Priority check-in and boarding

Preferred seats

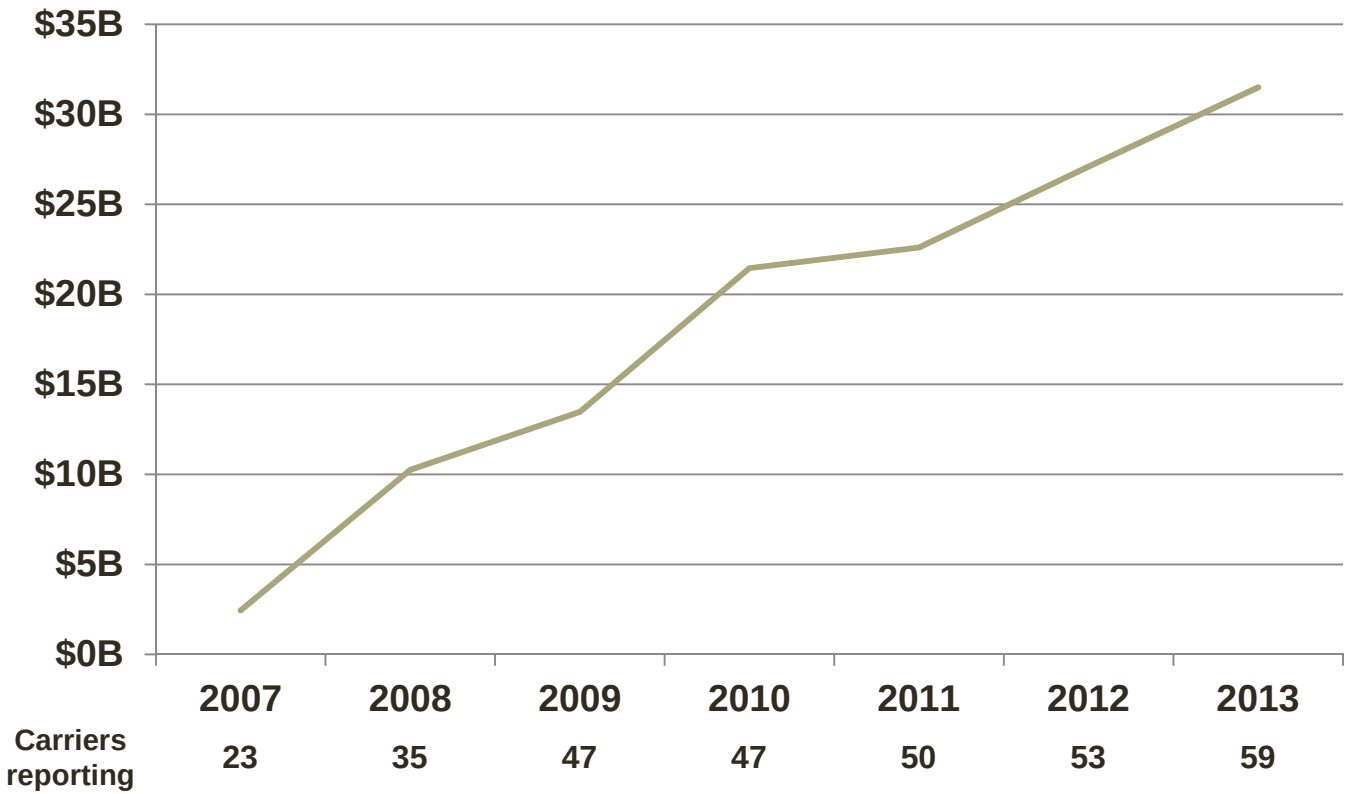
In-flight entertainment and Internet access

These “ancillary” products maximize per-customer revenue capture while making price comparisons more difficult



Ancillary revenue is growing sharply

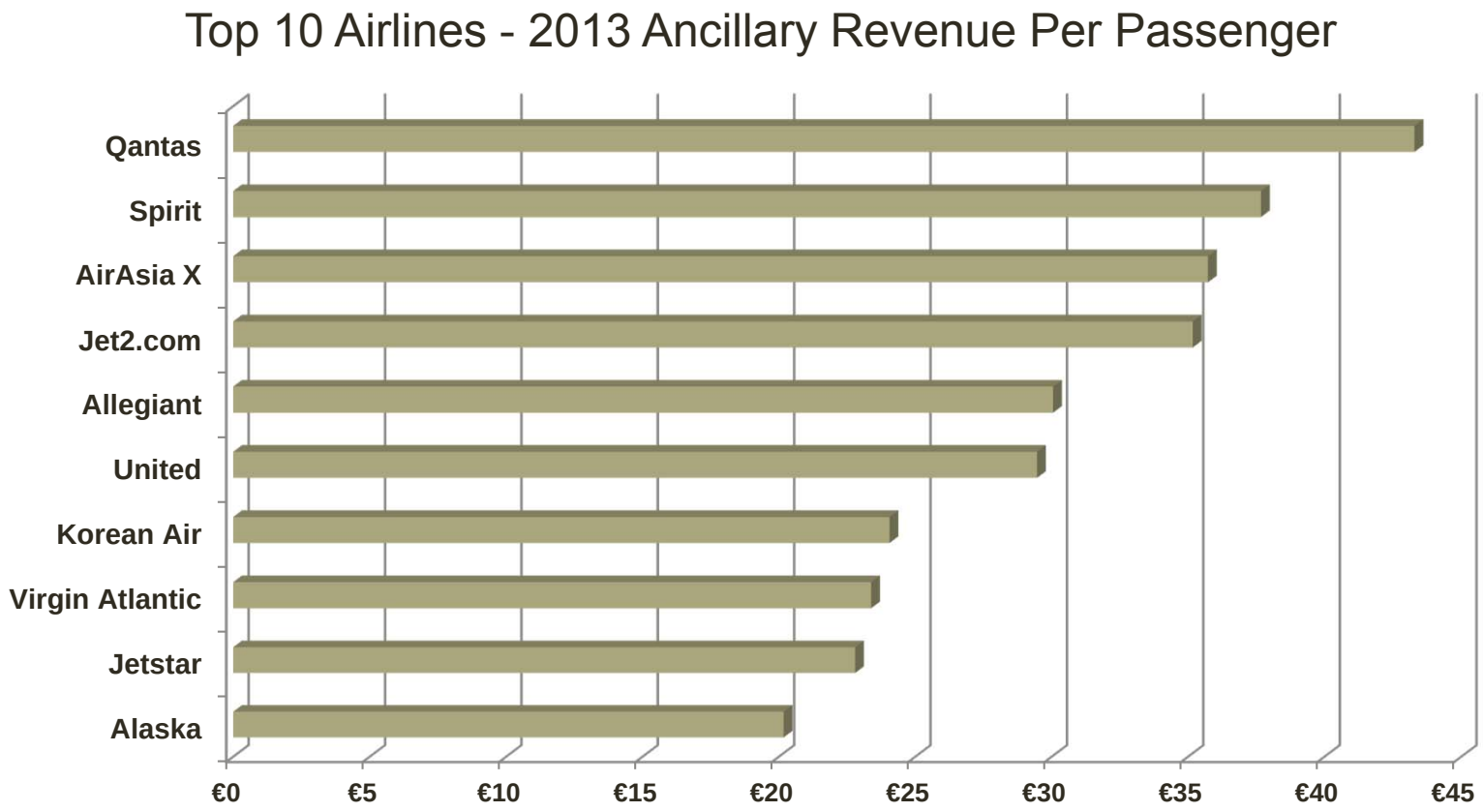
Airline-reported ancillary revenue has grown from $2.5B to more than €31B in six years



Source: IdeaWorks / Amadeus joint press release, July 16, 2014

Ancillary revenue: not just for low-cost carriers

Some large network carriers are the among the most successful



Source: IdeaWorks' *Yearbook of Ancillary Revenue Results*, 2013

Improve customer perception of value through "fare branding"

At first, customers may perceive unbundling as unjustified up-charging

"Why is the airline making me pay for what I used to get for free?"

Fare branding or "fare families" help clarify the relationship between fare paid and value received – *and can even encourage "buy-up"!*

Video: Air New Zealand "fare families"

Improve customer perception of value through "fare branding"

At first, customers may perceive unbundling as unjustified up-charging

"Why is the airline making me pay for what I used to get for free?"

Fare branding or "fare families" help clarify the relationship between fare paid and value received – *and can even encourage "buy-up"!*

Example: Air New Zealand "fare families"

Int'l Airline	Departs	Arrives	Duration	Seat •1 carry on bag, 7kg •Tea, coffee & water (no meal) •Buy snacks onboard •TV, music, games, Air NZ flights only	Seat + Bag **Seat option plus:** •1 checked bag, 23 kg Please note: meal not included	The Works **Seat + Bag plus:** •Meal and drinks •Movies •Seat request	WorksDeluxe **The Works plus:** •1 extra bag, 23kg •Premium check-in •Lounge access •Neighbour free guarantee
	6:45 pm Tue 13 Mar	11:55 pm Tue 13 Mar	3h 10m 1 flight	$229	$254	$284	$399
	9:20 am Tue 13 Mar	2:30 pm Tue 13 Mar	3h 10m 1 flight	$279	$304	$334	Not available
	9:40 am Tue 13 Mar	5:30 pm Tue 13 Mar	5h 50m 2 flights	$341	$366	$396	$541
	11:30 am Tue 13 Mar	7:30 pm Tue 13 Mar	6h 0m 2 flights	$341	$366	$396	$541

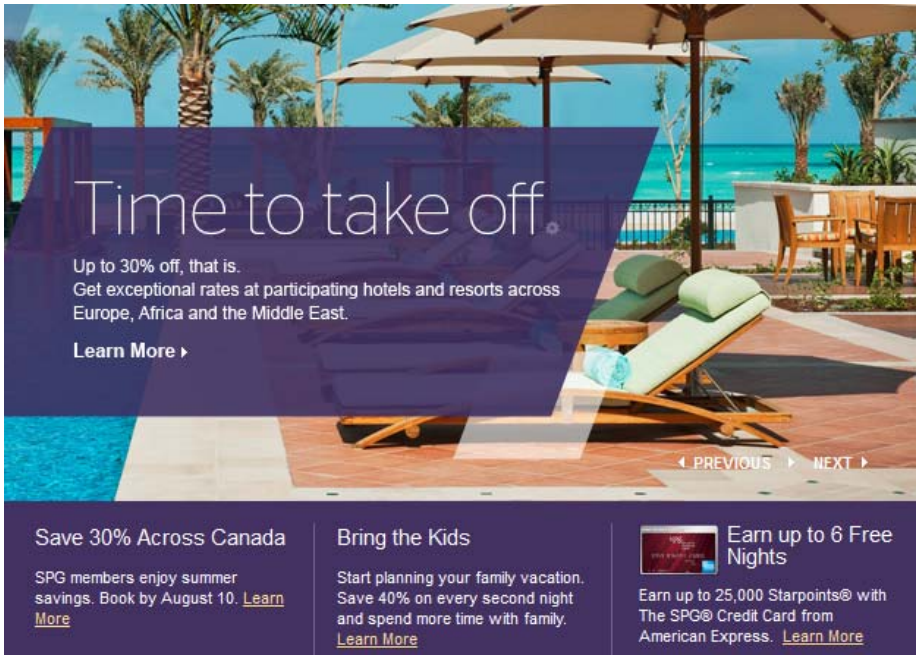
Customer data is being used to target personalized product bundles and pricing …

Create customized offers based on customer profile and purchase history

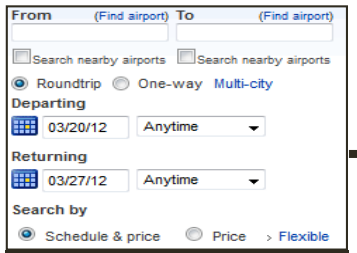
- Offer discounts or bonuses (loyalty miles, free ancillary products)
- Reinforce customer loyalty by getting them to “shop with us first”

Next step: Channel-specific pricing and availability

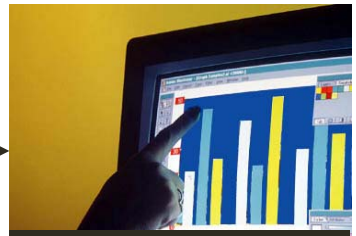
- Drive traffic to lower-cost booking channels (e.g., airline website)



… which means a wide range of data must be retained and analyzed



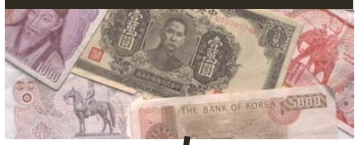
Airline website



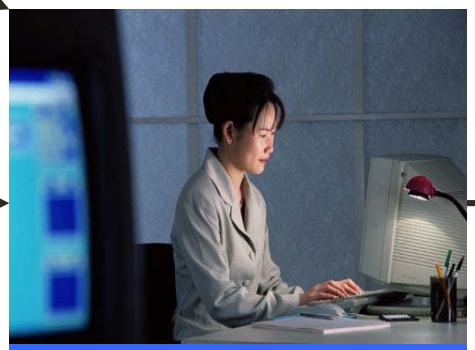
Web analytics / look-to-book data

Schedule

Available fares & demand forecast



Call centers



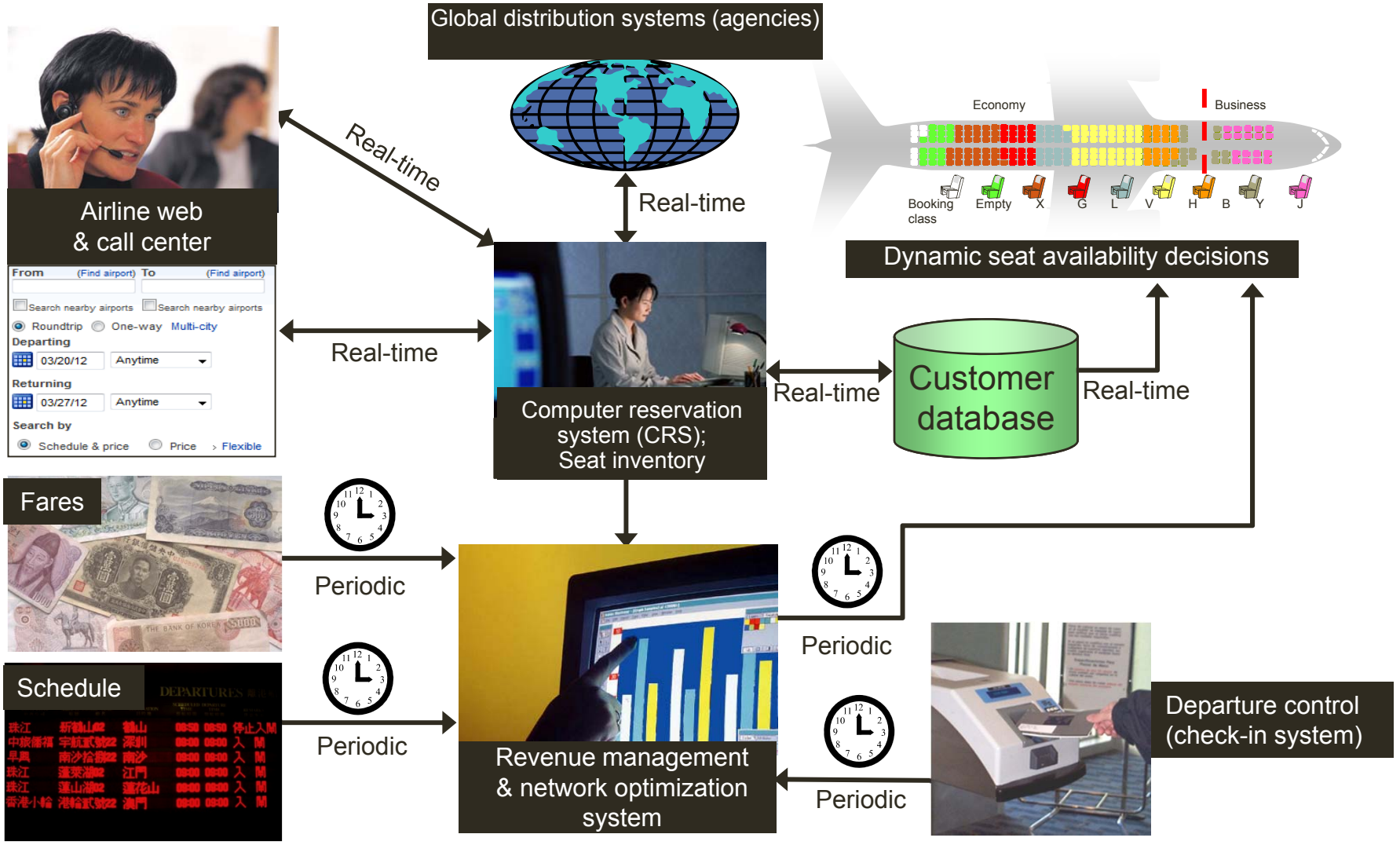
Customer data / CRM

Optimization module or "offer engine"

GDS / agencies

Customized and dynamic product offers, pricing, and availability

The integrated customer database is key to an ideal revenue management platform …



… but it requires an airline to capture and utilize a wide range of customer & transaction data

Internet retailers know that “look-to-book” matters just as much as “booked”

- What markets/dates are customers querying *even when they don’t buy*?
- Use website “screen scraping” to compare real-time fares
- Analyze online fare searches by O&D to find restrictive fare inventory or less-preferred schedules

Multiply RM’s benefits by using customer data to make customized offers

- Target discount offers based on specific customer’s transaction history
- Reinforce loyalty by getting customers to “shop with us first”

Infrastructure is expensive and customer buy-in takes time, but the return on investment is worth the effort!

Important concepts

Revenue management maximizes revenue by forecasting demand, segmenting customers, & optimizing fare availability

Forecast data has many other valuable uses for an airline

Optimal revenue management requires a careful balance between spill and spoilage

Successful airlines focus on revenue per available seat-kilometer (RASK)

Future gains in revenue management will require a wealth of data in order to understand customers and shape their behavior