THE ENGAGED OWNER'S COURSE · IN 25 CHAPTERS

Revenue Management 101

for Engaged Hotel Owners

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Read with the companion workbook. Every slide names the sheet that carries its numbers.

BEFORE YOU START

Every chapter runs in the same order

01 The owner's question

02 The short answer

03 The formula, in full

04 On the specimen hotel

05 Ask your team

06 Red flags

The workbook goes alongside

Each chapter ends with a tag naming its sheet. The workbook's second sheet, RM101 Map, links every chapter to its sheets. Row 4 of each sheet names its chapter and links back.

Reading a sheet

Blue on gold is an input. Black is a formula. Green is linked from another sheet. Put your own PMS, STR and channel data in the gold cells. Don't decide on the specimen figures.

THE SPECIMEN HOTEL

One city hotel carries every number in the course

500	74%	$150	$111	$35.8m	$7.9m
keys, full service	occupancy	ADR	RevPAR	total revenue	EBITDA

A city with a midweek conference peak and a winter event season. Six segments, banquets and MICE, a five-hotel comp set. Chapter 23 adds a 120-key resort.

The figures are illustrative and they tie to each other. Read $ as your own currency, net of taxes and service charges.

TERM	WHAT IT MEANS
Occupancy	Rooms sold ÷ rooms available
ADR	Rooms revenue ÷ rooms sold
RevPAR	Rooms revenue ÷ rooms available
Net ADR	ADR after every cost of winning the booking
Displacement	Business turned away by saying yes to other business
Bid price	What the last room on a night is worth

PART 1

Foundations

1

1 Where revenue management works

2 The scoreboard

3 Fair share and the comp set

CHAPTER 1 · FOUNDATIONS

Where revenue management works

“Is my hotel the kind of business this works for?”

For the rooms, almost certainly. Revenue management decides, for every room night, which guest to accept, at what price and through which channel. The aim is the owner's profit from capacity that perishes at midnight.

Sheryl Kimes set six conditions under which it pays. Kimes and Chase added two levers: how much you vary price, and how well you control duration.

THE TEST

```
Score each condition 1 to 5
  Relatively fixed capacity
  High fixed, low variable cost
  Perishable inventory
  Reservations in advance
  Variable demand
  Known price sensitivity
Out of 30
```

Then place each outlet on price variety × duration control. The goal is Q2: many prices, controlled duration.

CHAPTER 1 · ON THE SPECIMEN

25 out of 30, and price sensitivity is the weak spot

Scores of 5, 4, 5, 4, 4 and 3. The hotel doesn't yet know how each segment reacts to a price move. Chapter 11 measures it. The course puts the uplift at 2 to 5% of revenue.

OUTLET	QUADRANT	LEVER TO PULL
Rooms	Q2	Refine: LOS controls, more fenced rates
Ballroom	Q1	Add day-part and lead-time prices
Spa	Q1	Add day-part and day-of-week prices
Restaurants	Q3	Duration first, then prices
Bars and lounge	Q3	Duration first, then prices

ASK YOUR TEAM

- Which condition is weakest here, and what's the fix?
- Which lever are we pulling in each outlet this year?

RED FLAGS

- RM run only for rooms, when rooms earn under 60% of revenue.
- Nobody knows what a 1% rate rise does to each segment.

CHAPTER 2 · FOUNDATIONS

The scoreboard

“Which number tells me the hotel is doing well?”

No single one. RevPAR says how well the rooms sell. Net RevPAR says what you keep after paying for the booking. TRevPAR and GOPPAR say what the whole hotel earns per room.

Rooms available means every room, every night. Cheap OTA volume can hold RevPAR up while GOPPAR falls.

THE FORMULAS

```
RevPAR = Occ × ADR
       = Rooms rev ÷ rooms avail
Net RevPAR
  = (Rooms rev − acq. cost)
    ÷ rooms available
TRevPAR = Total rev ÷ rooms avail
GOPPAR  = GOP ÷ rooms available
Flow-through = ΔEBITDA ÷ ΔRevenue
```

Acquisition cost: commission, fees and media paid to win the booking.

Workbook › 01 KPIs, 13 Total Revenue

CHAPTER 2 · ON THE SPECIMEN

Revenue rose $1.86m and 27% of it reached EBITDA

$111.01 RevPAR	**$104.14** Net RevPAR	**$195.95** TRevPAR
$43.29 EBITDA per room	**36%** of revenue from F&B	**26.9%** flow-through

A full-service hotel should keep 35 to 45% of new revenue. At 27%, growth is being bought with cost. Fix the cost base before you buy more volume.

ASK YOUR TEAM

- How has Net RevPAR moved against RevPAR this year?
- What was flow-through on our growth, and which department absorbed it?

RED FLAGS

- The monthly pack leads with occupancy.
- RevPAR is up and GOPPAR is flat or down.

CHAPTER 3 · FOUNDATIONS

Fair share and the comp set

“Are we beating the market, or just riding it?”

Compare the hotel with the four to seven hotels a guest would really shop against it. An index of 100 means you take exactly your share.

RGI is MPI × ARI ÷ 100. So you can always see whether a gap comes from volume or from price.

THE FORMULAS

```
MPI = Occ hotel ÷ Occ comp × 100
ARI = ADR hotel ÷ ADR comp × 100
RGI = RevPAR hotel
      ÷ RevPAR comp × 100
    = MPI × ARI ÷ 100

Fair share of supply
  = hotel rooms ÷ comp-set rooms
```

Comp set rules: 4 to 7 hotels, none above 40% of the set's rooms, at least two owners. Review yearly.

Workbook › 01 KPIs, 29, 30

CHAPTER 3 · ON THE SPECIMEN

Fills its share, sells 14% cheaper: a $3.84m gap

MEASURE	HOTEL	COMP SET	INDEX
Occupancy	74.0%	76.0%	MPI 97.4
ADR	$150.02	$173.75	ARI 86.3
RevPAR	$111.01	$132.05	RGI 84.1

The problem is price. At an RGI of 100 the hotel would take $24.10m in rooms revenue. It takes $20.26m.

Looking forward, the hotel has 16.1% of the comp set's rooms. Any week where it holds less than 16.1% of the set's bookings needs action now.

ASK YOUR TEAM

- Is our gap volume or price? Show MPI and ARI apart.
- Which weeks ahead are below our forward fair share?

RED FLAGS

- The comp set hasn't changed in five years.
- RGI under 100 two weeks running, and no action.

PART 2

Demand

2

4 Segmentation

5 The booking curve, pickup and pace

6 Unconstraining

7 Forecast accuracy

8 Hot, warm and cold nights

CHAPTER 4 · DEMAND

Segmentation

“Who fills my hotel, and which of them is worth most?”

Keep three labels apart on every room night. The segment is who booked. The rate category is the terms. The channel is the road the booking came by.

USALI 12 sets the segments. Transient is under 10 rooms a night. Group is 10 or more on one contract. Contract is a block held over 30 days.

THE FORMULAS

```
Net ADR = ADR × (1 − acq. cost %)

Contribution per RN
  = Net ADR × rooms margin
  + F&B per RN × F&B margin
```

THREE RULES

Gross or net: book it one way, always.
Stacked discounts: the deeper offer sets the segment.
Revenue lands on the dates of stay.

CHAPTER 4 · ON THE SPECIMEN

A wedding guest leaves $229 a night; a BAR guest $155

SEGMENT (PMS CODE)	SHARE	NET ADR	CONTRIB. / RN
Wedding and social	8%	$165	$229
MICE groups	14%	$149	$161
Brand.com (BAR)	12%	$177	$155
Corporate negotiated	24%	$150	$132
OTAs	18%	$135	$118
Long stay, embassy	3%	$131	$112
Wholesale and tour	7%	$118	$102
Loyalty redemption	4%	$113	$101
Airline crew	10%	$78	$66

The banquet spend does it. Column L of sheet 02 maps each PMS code to USALI 12.

ASK YOUR TEAM

- Are segment, rate category and channel separate fields in our PMS?
- Does our protection follow contribution, F&B included?

RED FLAGS

- A segment called “OTA” or “Website”.
- Group revenue booked to the month the contract was signed.
- Over 5% of room nights in “Other”.

CHAPTER 5 · DEMAND

The booking curve, pickup and pace

“Are we ahead or behind for next Tuesday?”

Compare what's on the books today with what was on the books at the same point before past Tuesdays. Each night of the week fills along its own curve.

Additive pickup assumes the same number of rooms still to come. Multiplicative assumes the same share. Groups always use multiplicative.

THE FORMULAS

```
Pace vs curve = OTB ÷ curve − 1
Pace vs STLY  = OTB ÷ STLY − 1

F add  = OTB + avg pickup
F mult = OTB × avg(final ÷ OTB)
```

OTB: rooms on the books at d days out. STLY: same time last year, same day of week. Build the curve from 90, 60, 30, 14, 7, 3 and 1 days out.

CHAPTER 5 · ON THE SPECIMEN

372 on the books against a curve of 346: lift BAR

+7.4%
pace vs curve

+10.1%
pace vs STLY (338)

74%
of final, 14 days out

TUESDAY FORECAST, 14 DAYS OUT	ROOMS
Additive: 372 + 124	496
Multiplicative: 372 × 1.359	506
Blended, against 500 sellable	501

Lift BAR a tier, close the discounts, put a two-night minimum on the shoulders.

ASK YOUR TEAM

- Show pace for the next 90 nights, against curve and last year.
- Which method do we use at each horizon, and why?

RED FLAGS

- Pace only against last year. A badly run night is a poor benchmark.
- One curve for every night of the week.

CHAPTER 6 · DEMAND

Unconstraining

“If we sold out, how many more could we have sold?”

A sold-out night records the cap. Forecast from rooms sold and the hotel underprices its best nights for ever.

Start with the denial log from every channel. Only some denied guests would have booked, so apply a conversion share.

THE FORMULAS

```
Unconstrained
  = Rooms sold + s × Denials

Spill = Unconstrained − Sold
```

s: the share of denials that would have booked. Projection detruncation and the EM method refine this (Weatherford and Pölt, 2002). Neither works without denials recorded.

CHAPTER 6 · ON THE SPECIMEN

33 rooms a night of demand the history never shows

499
rooms sold, average of 8 peak nights

532
unconstrained demand

+6.6%
more demand than recorded

21.5
rooms, standard deviation

The specimen assumes 55% of denials would have booked. Those 33 rooms of spill are the room for a price rise on peak nights.

ASK YOUR TEAM

- Do we log denials on every channel, the booking engine too?
- What share do we assume would have booked, and why?

RED FLAGS

- Denials logged only from the phone.
- Last year's sell-out forecast at last year's rooms sold.

CHAPTER 7 · DEMAND

Forecast accuracy

“How good is our forecast?”

Ask for four measures at each horizon. MAD is the average miss in rooms. WAPE weights the big nights, so it's the better headline. Bias shows which way the forecast leans.

The tracking signal separates luck from method. Beyond ±4, the method is biased.

THE FORMULAS

```
MAD  = Σ|A − F| ÷ n
MAPE = Σ(|A − F| ÷ A) ÷ n
WAPE = Σ|A − F| ÷ ΣA
Bias = Σ(A − F) ÷ n
TS   = Σ(A − F) ÷ MAD
```

A is actual rooms, F is forecast, n is nights. MAPE weights a 262-room night as heavily as a 462-room night. WAPE does not.

CHAPTER 7 · ON THE SPECIMEN

WAPE looks fine; the bias says the forecast runs high

HORIZON	MAD	WAPE	BIAS	TS
30 days	35.3	8.9%	-15.5	-4.4
14 days	20.1	5.1%	-8.7	-4.3
7 days	9.7	2.4%	-4.1	-4.2
1 day	2.9	0.7%	-1.1	-3.8

Every horizon is negative, and the tracking signal is past -4 at 30, 14 and 7 days: a biased method. On the Tuesday test, MAPE is only 2.7% and TS is -6.0. A hotel with this forecast closes discounts too early on soft nights.

ASK YOUR TEAM

- Show MAD, WAPE and bias at 30, 14, 7 and 1 day out.
- If TS is outside ±4, what have we changed?

RED FLAGS

- Accuracy shown as one MAPE, with no bias.
- Accuracy measured only the day before arrival.

CHAPTER 8 · DEMAND

Hot, warm and cold nights

“What should we do differently on each night of the next fortnight?”

Sort the nights into zones by forecast occupancy and give each zone its own rules. That's the demand-control chart. I'd put it in front of the GM every morning.

Use room nights, arrivals plus stayovers.

THE FORMULA

```
Forecast occupancy(n)
  = Unconstrained RN forecast(n)
    ÷ Sellable rooms

Hot   ≥ 100%   min BAR 7
Warm  80–99%   min BAR 4
Cold  < 80%    min BAR 1
```

The course divides arrivals by capacity. That understates any night heavy with stayovers.

CHAPTER 8 · ON THE SPECIMEN

Three hot, five warm and six cold nights ahead

Wed **96%** Warm	Thu **94%** Warm	Fri **77%** Cold	Sat **72%** Cold	Sun **58%** Cold	Mon **85%** Warm	Tue **104%** Hot
Wed **100%** Hot	Thu **90%** Warm	Fri **69%** Cold	Sat **63%** Cold	Sun **62%** Cold	Mon **88%** Warm	Tue **102%** Hot

ZONE	MINIMUM BAR	INSTRUCTION
Hot	BAR 7, $228	Close below BAR 7; MinLOS 2 if the shoulder is soft
Warm	BAR 4, $181	Close below BAR 4; hold groups to displacement
Cold	BAR 1, $144	All rates open; push fenced offers

ASK YOUR TEAM

- Which nights are hot, warm and cold, and what's open on each?
- When did we last move the triggers?

RED FLAGS

- Same rates open on a hot Tuesday and a cold Sunday.
- Zones set on arrivals, not room nights.

PART 3

Price

3

9 Price response and elasticity

10 The BAR ladder and attributes

11 Should we move the price?

12 Rate shopping and parity

13 Reputation as pricing power

CHAPTER 9 · PRICE

Price response and elasticity

“What's the right price for tonight?”

The one that earns the most contribution from the rooms you have left. That depends on how many guests each extra dollar loses you, and on whether demand exceeds rooms.

When demand exceeds the rooms, the cap sets the price.

THE FORMULAS

$$D = a - bP$$

$$\pi = (P - c)(a - bP)$$

$$P^* = \tfrac{1}{2}\,(a \div b + c)$$

$$P_{cap} = (a - C) \div b$$

$$\varepsilon = -bP \div D$$

a and b: tonight's demand line. c: variable cost per occupied room. C: transient rooms left. Post P* unless it would sell more rooms than C; then post Pcap.

CHAPTER 9 · ON THE SPECIMEN

The cap binds, so the price to post is $193

a = 520 rooms, b = 1.76 rooms per dollar, c = $23.75, 180 transient rooms left. P* is $159.60, but 239 guests would want a room at that price.

BAR	ROOMS SOLD	REVENUE	CONTRIBUTION
$175.00	180	$31,500	$27,225
$187.50	180	$33,750	$29,475
$193.18	180	$34,773	$30,498
$200.00	168	$33,600	$29,610
$212.50	146	$31,025	$27,558

Elasticity at $193 is -1.89. Revenue peaks where elasticity is -1; contribution peaks higher, because each guest costs $23.75 to serve.

ASK YOUR TEAM

- On a sell-out night, did we price from demand or from the comp set?
- Is variable cost in our pricing?

RED FLAGS

- The same BAR on a night with 33 rooms of spill as on one with none.
- Prices set on revenue, with no cost in the sum.

CHAPTER 10 · PRICE

The BAR ladder and attributes

“What are BAR 1, 2 and 3, and who decides which we sell?”

BAR is the lowest unrestricted rate on sale tonight. A ladder of tiers moves price in planned steps, set off by forecast occupancy. Every other rate hangs off the tier in force.

A fence must be something the BAR guest won't accept, like paying 21 days ahead.

THE FORMULAS

```
BAR(n) = BAR(1) × (1 + s)^(n−1)

Room type = tier × (1 + diff.)
Fenced    = tier × (1 − discount)

Attribute revenue
  = price × take × occupied RNs
```

Specimen: eight tiers, s = 8%, BAR 1 = $143.75 for a Deluxe King.

CHAPTER 10 · ON THE SPECIMEN

Eight tiers from $144 to $246, with suites on top

TIER	OPENS AT	DELUXE	CLUB	JR SUITE	SUITE
BAR 1	0%	$144	$187	$266	$374
BAR 2	55%	$155	$202	$287	$403
BAR 3	62%	$168	$218	$311	$437
BAR 4	68%	$181	$235	$335	$471
BAR 5	74%	$196	$255	$363	$510
BAR 6	80%	$211	$274	$390	$549
BAR 7	86%	$228	$296	$422	$593
BAR 8	92%	$246	$320	$455	$640

Club +30%, Junior Suite +85%, Suite +160%. Five attributes at assumed take rates add $544,000 a year.

ASK YOUR TEAM

- Which tier is loaded for each of the next 30 nights?
- How often does a BAR guest get round our fences?

RED FLAGS

- Twenty rate codes and no ladder.
- Suites sell out first every peak. They're underpriced.

CHAPTER 11 · PRICE

Should we move the price?

“The revenue manager wants to cut BAR by 10%. Should I agree?”

Only if volume will rise by more than the break-even amount. Work that out first. Then measure elasticity from your own STR data to see what volume change to expect.

THE FORMULAS

$$\%\Delta Q \text{ break-even} = -(\Delta P - \Delta VC) \div (CM + \Delta P - \Delta VC)$$

$$\ln FSI(t) = \alpha + E \times \ln ARI(t)$$

$$FSI = \text{rooms sold} \div \text{fair share}$$

$$Q1 \div Q0 = (P1 \div P0)^{E}$$

CM: contribution margin per room night. If E comes out positive, or R^2 is under about 0.3, don't use it.

CHAPTER 11 · ON THE SPECIMEN

A 10% cut loses $1,676 a night; an 8% rise earns $961

−0.72
elasticity, 20 weeks

0.66
R^2

$160.63
CM on $184.38 BAR

TEST	BREAK-EVEN	PREDICTED	AT 180 ROOMS
Cut 10%	+14.5%	+7.8%	−$1,676, destroys value
Rise 8%	−8.4%	−5.4%	+$961, rise pays

If the comp set lifts BAR by $8.75 and you hold, you need 5.4% more volume to justify holding.

ASK YOUR TEAM

- What's the break-even volume change for this move?
- What's our measured elasticity, over how many weeks, at what R^2?

RED FLAGS

- A cut justified by “we need the occupancy”.
- An elasticity nobody can trace to data.

CHAPTER 12 · PRICE

Rate shopping and parity

“The comp set dropped its rate. Should we follow?”

Not automatically. A rate shopper tells you where you stand. Your demand tells you what to charge. Read your position as an index, beside the demand zone.

Shop like for like: same room, two adults, taxes normalised, public and member rates kept apart.

THE FORMULAS

```
Price index(n)
  = Own BAR ÷ comp median × 100

Parity leakage
  = direct-intent room nights
  × share of shops undercut
  × share who switch
  × extra acquisition cost
```

Most disparity comes from a wholesale or bed-bank rate resold on an OTA.

CHAPTER 12 · ON THE SPECIMEN

Underpriced on a hot Tuesday, too dear on a cold Sunday

NIGHT	OWN	MEDIAN	INDEX	ZONE	READ
Wed +1	$181	$174	104	Warm	Consistent
Mon +6	$181	$198	92	Warm	Consistent
Tue +7	$228	$245	93	Hot	Underpriced: lift
Sun +5	$144	$130	111	Cold	Above market: fence an offer

Parity: 18% of shops find an OTA cheaper than brand.com, and 30% of the direct guests who see it switch. At $41.81 of extra cost a night, the leak is $37,000 a year.

ASK YOUR TEAM

- What's our index tonight, and on the next hot night?
- Where did the last parity breach come from?

RED FLAGS

- Following the comp set down on a night we'll sell out.
- Our refundable rate shopped against their non-refundable one.

CHAPTER 13 · PRICE

Reputation as pricing power

“Is the review score a marketing number or a revenue number?”

A revenue number. Chris Anderson's Cornell study (2012) found a one-point rise on a five-point scale let a hotel raise price 11.2% and keep its occupancy.

Fix the product and how you answer reviews first. Then raise the rate.

THE FORMULAS

```
Price headroom
  = Δscore (5-point) × 11.2%

Revenue at stake
  = Rooms revenue × headroom
```

A 10-point score converts to five points by halving. Value for money and the age of the product drag scores down most.

CHAPTER 13 · ON THE SPECIMEN

From 7.9 to 8.7 is worth $908,000 a year

7.9 → 8.7
score out of 10, leading OTA

0.4
points on a five-point scale

4.5%
price headroom

$908k
rooms revenue a year

The prize in chapter 25 counts only half of it, because the score has to move before the rate can.

ASK YOUR TEAM

- What are guests marking us down for, site by site?
- When we last raised rates, did value for money move?

RED FLAGS

- Rates raised while the score is falling.
- Nobody owns review responses.

PART 4

Inventory

4

14 Nested protection

15 Bid prices and length of stay

16 Overbooking

CHAPTER 14 · INVENTORY

Nested protection

“How many rooms should we hold for guests who'll pay more later?”

Hold a room for the higher rate while the chance of selling it there, times that rate, beats the lower rate in hand. That's Littlewood's rule (1972).

Belobaba's EMSR-b (1992) extends it to many classes. Limits nest: a higher class can always take a lower class's room.

THE FORMULAS

Littlewood, two classes

$$r1 \times P(D1 > y1) = r2$$

$$y1 = \mu1 + \sigma1 \times \Phi^{-1}(1 - r2 \div r1)$$

EMSR-b, classes 1..j as one

$$\bar{\mu} = \Sigma\mu \qquad \bar{\sigma} = \sqrt{(\Sigma\sigma^2)}$$

$$\bar{r} = \Sigma(r \times \mu) \div \Sigma\mu$$

$$yj = \bar{\mu} + \bar{\sigma} \times \Phi^{-1}(1 - rj{+}1 \div \bar{r})$$

Booking limit for the next class down = rooms left − yj. Run it per room type.

CHAPTER 14 · ON THE SPECIMEN

On a peak Tuesday, wholesale gets 48 rooms at most

500 rooms; 243 committed to LRA, crew and group blocks; 257 open to the dynamic classes.

CLASS	NET RATE	M	Σ	PROTECT	NEXT LIMIT
BAR, brand.com	$177.00	70	20	49	208
Advance purchase	$150.50	60	18	105	152
OTA, net of 18%	$135.25	110	30	209	48
Wholesale	$117.50	80	25		

The EHL course spreadsheet compares r1·P(D1 > y) with r2·P(D2 > y). Littlewood compares it with r2 itself. On the course's own example that lets the $100 class book 71 rooms instead of 52, at a cost of $149 a night.

ASK YOUR TEAM

- How many rooms are protected for BAR on the next five peak nights?
- Are our limits nested?

RED FLAGS

- Allocations by channel in place of nested limits.
- Protection set on gross rates, so the OTA looks like brand.com.

CHAPTER 15 · INVENTORY

Bid prices and length of stay

“Why did we refuse a one-night Tuesday booking when we had rooms?”

The room was worth more to a guest staying three nights through Tuesday. Take a stay if it covers the bid prices of every night it uses.

An RMS solves the week as one linear programme.

THE FORMULAS

```
BP(n) ≈ r̄ × P(D(n) > rooms left)
Accept if Σ rate ≥ Σ BP(n)
  over the nights of the stay

LP: max Σ r(j) × LOS(j) × x(j)
  s.t. Σ x(j) through n ≤ C(n)
       0 ≤ x(j) ≤ D(j)
BP(n) = shadow price of C(n)
```

x(j): stays of product j accepted. D(j): its demand. C(n): rooms left on night n.

CHAPTER 15 · ON THE SPECIMEN

Tuesday's last room is worth $154; Monday's $10

Monday	Tuesday	Wednesday	Thursday
$10	$154	$151	$4

REQUEST	PAYS	Σ BIDS	DECISION
1 night Tue, OTA	$135	$154	Decline
3 nights Mon–Wed, OTA	$406	$315	Accept
2 nights Tue–Wed, AP	$301	$305	Decline
1 night Mon, OTA	$135	$10	Accept

On the LP, a Thursday OTA arrival is closed for one or two nights and open for three, because the third night reaches the empty weekend. No single MinLOS rule can do that.

ASK YOUR TEAM

- What's the bid price on each of the next 14 nights?
- Did our LOS rules come from bid prices or habit?

RED FLAGS

- A two-night minimum on every Tuesday, all year.
- One-night stays taken on a peak night, longer stays through it refused.

CHAPTER 16 · INVENTORY

Overbooking

“How many rooms should we oversell?”

Oversell until the next booking's expected gain from filling a no-show equals its expected cost of a walk. Arrivals follow a binomial distribution.

When a walk can't be priced, cap how often one happens (Toh and DeKay, 2002).

THE FORMULAS

$$X \sim \text{Bin}(n, 1 - p)$$

$$EV(n) = m \times E[\min(X, C)] - W \times E[(X - C)^+]$$

Overbook room k while

$$P(\text{no-shows} \geq k) \geq W \div (W + E)$$

Service level, smaller root of

$$(1-p)^2X^2 - [2C(1-p) + z^2p(1-p)]X + C^2 = 0$$

p: no-show rate. m and E: contribution of a filled room. W: cost of a walk.

Workbook › 09, 23 Overbooking, 27

CHAPTER 16 · ON THE SPECIMEN

Accept 526 on a sell-out night: $178,000 a year

526
to accept: 26 over, today 512

0.9
walks expected a night

$2,675
a night over no overbooking

514
cap if 90% of nights must be walk-free

p = 5.5%, m = $123.57, W = $275, 140 sell-out nights. A wedding block of 150 that historically uses 85%: allocate 129 and release 21 at cut-off.

Never walk a top-tier member, a returning guest or a late arrival without a car waiting.

ASK YOUR TEAM

- What's our level on a sell-out Tuesday, and how was it set?
- How many walks last year, at what cost each?

RED FLAGS

- “We never overbook.”
- One overbooking number for every night of the week.

PART 5

Business mix

5

17 Groups: displacement and the floor

18 The long-term segment mix

19 Corporate accounts and LRA

20 Distribution and digital demand

21 Function space

22 Guest value

23 Resorts

CHAPTER 17 · BUSINESS MIX

Groups: displacement and the floor

“A group wants 150 rooms for three nights at $131. Do we take it?”

Take it if what it leaves you, rooms and F&B after wash, beats the transient it pushes out. Work it night by night.

The floor is where you'd be no worse off. Open from the win curve, well above it.

THE FORMULAS

$$\text{Displaced}(n) = \max(0, \text{Picked}(n) - \text{Free}(n))$$

$$\Delta\Pi(n) = \text{Picked} \times cg - \text{Displaced} \times ct$$

$$G = VC - AC \div N + \Sigma\Sigma\, L(R - VC) \div N$$

$$P(\text{win}|q) = 1 \div (1 + e^{-(\beta 0 + \beta 1 q)})$$

$$E[\Pi] = P(\text{win}|q) \times (q - G) \times N$$

cg, ct: contribution per room night, group and transient, F&B in. L: rooms displaced from class k on night n.

CHAPTER 17 · ON THE SPECIMEN

Accept, but Tuesday barely pays: quote Sunday to Tuesday

NIGHT	PICKED UP	FREE	DISPLACED	NET CHANGE
Monday	132	120	12	+$17,445
Tuesday	132	10	122	+$2,553
Wednesday	132	30	102	+$5,261
Total				+$25,259

$83.83
floor, 400 RNs Sun–Wed

$150
best quote: $17,211 expected

$152.92
LP floor, 60 rooms Tue–Wed

On the LP, 120 group room nights displace 140: three-night stays through Tuesday are lost whole.

ASK YOUR TEAM

- Show displacement night by night, F&B on both sides.
- What's the floor, the quote, and where's the win curve from?

RED FLAGS

- Groups priced on the average of the dates.
- No lost-business log, so no win curve.

CHAPTER 18 · BUSINESS MIX

The long-term segment mix

“How much of the hotel should we sell to groups, as a strategy?”

Give a room to groups when the next transient room is worth less than the group. The x-th transient room is worth its rate times the chance demand reaches x.

This sizes the sales team and how the space is sold. It belongs in the budget.

THE FORMULAS

$$E[x\text{-th transient room}] = rt \times P(Dt \geq x)$$

$$y* = \mu t + \sigma t \times \Phi^{-1}(1 - rg \div rt)$$

y*: rooms to protect for transient. rg and rt: group and transient value. Use contribution in place of rate to count F&B on both sides.

CHAPTER 18 · ON THE SPECIMEN

Count the banquet spend and 65 rooms move to groups

A shoulder-season weekday: transient demand of 340 with σ of 50. Transient pays $155 net; the group's room element is $112.50.

BASIS	G ÷ T	PROTECT	GROUPS	MIX
Rate only	0.73	310	190	62 : 38
Contribution	0.97	245	255	49 : 51

On room rate alone, transient wins most of the house. Count F&B and the line moves toward groups.

ASK YOUR TEAM

- What mix do we aim for on each day type, and on what basis?
- Is our sales effort sized to that mix?

RED FLAGS

- Group targets set as last year plus 5%.
- The mix argued on room rate alone.

CHAPTER 19 · BUSINESS MIX

Corporate accounts and LRA

“Should we give this account last-room availability?”

Only if its rate clears the bid price on the nights it uses. LRA means you must sell the negotiated rate on your best nights. NLRA lets you close it.

THE FORMULA

$$\text{Net value} = N(1 - s)(r \times \text{mrooms} + f \times \text{mF\&B}) + N \times s \times (r - \text{BPpeak}) \times \text{mrooms}$$

$$\text{Grant LRA only where } r \geq \text{BPpeak}$$

N: the account's room nights. s: share on peak nights. r: its rate. f: F&B per room night. The specimen's peak bid price is $154.

CHAPTER 19 · ON THE SPECIMEN

The biggest account is worth the least

ACCOUNT	RNS	RATE	ON PEAKS	NET VALUE	DECISION
Pharma major	1,200	$136	30%	$96,003	Accept
Embassy	900	$123	10%	$86,326	Accept
Consulting firm	1,800	$148	65%	$75,422	NLRA
IT services	2,400	$128	70%	$46,014	NLRA

IT services brings the most room nights, and 70% of them land on nights the hotel could sell for more. The pharma account pays less than the consulting firm and is worth more, because most of its nights are soft.

ASK YOUR TEAM

- What share of each top-20 account's nights are peak nights?
- Does every LRA rate clear the peak bid price?

RED FLAGS

- Accounts ranked on volume.
- LRA thrown in to win the RFP.

CHAPTER 20 · BUSINESS MIX

Distribution and digital demand

“Which channels are actually making us money?”

Rank them on what they leave you after every cost of the booking. Treat the OTAs as paid acquisition.

Pay for a search click only when it's worth more than it costs, and only for demand that wouldn't have come anyway.

THE FORMULAS

```
Net ADR(c) = ADR(c) × (1 − k(c))
           − F(c) ÷ LOS
Acq. cost % = Σ costs ÷ rooms rev

CPA  = Spend ÷ Bookings
ROAS = Revenue ÷ Spend
Value per click
  = contribution per booking
  × conversion
```

k: the channel's percentage cost. F: its fixed cost per booking. Bid while the extra clicks cost less than they're worth.

CHAPTER 20 · ON THE SPECIMEN

Winning bookings costs $1.25m a year, 6.2% of rooms

CHANNEL	SHARE	ADR	NET ADR
Brand.com and app	12%	$184.38	$177.11
Voice and direct	6%	$172.50	$166.27
Group and MICE sales	22%	$158.13	$154.96
GDS, corporate	20%	$155.00	$144.98
OTAs	18%	$165.00	$135.30
Wholesale	7%	$117.50	$117.50

Moving 3% of room nights from the OTAs to brand.com saves $93,000. Only about 7% of OTA shoppers go on to book direct (Kalibri Labs, 2016).

Paid search: CPA $76 and ROAS 4.4, so 22.9% of revenue, dearer than the OTA's 18%. A pause test found 35% of bookings truly incremental.

ASK YOUR TEAM

- What's Net ADR by channel, and total acquisition cost?
- When did we last run a brand-search pause test?

RED FLAGS

- The channel report shows volume and gross ADR only.
- Brand bidding judged on ROAS alone.

CHAPTER 21 · BUSINESS MIX

Function space

“Two enquiries want the ballroom on the same Saturday. Which wins?”

The one that leaves the most total contribution per square foot, rooms included. Measure space the way you measure rooms: per unit of capacity, per period.

THE FORMULAS

```
RevPAST = Space revenue
          ÷ (sq ft × sessions)
ConPAST = Space contribution
          ÷ (sq ft × sessions)

Decide on total contribution
  ÷ sq ft, rooms included
```

Sessions: three a day, 1,095 a year on the specimen. Check any rooms against displacement first.

CHAPTER 21 · ON THE SPECIMEN

The biggest banquet cheque is worth the least

32,000 sq ft and $7.15m of banquet revenue: a RevPAST of $0.20 and a ConPAST of $0.08 per sq ft per session.

ENQUIRY	BANQUET	RNS	TOTAL	/ SQ FT
Pharma conference, 300	$40,000	540	$76,585	$2.39
Wedding, 450, with rooms	$51,250	240	$47,427	$1.48
Wedding, 600, no rooms	$67,500	0	$27,000	$0.84

Check the conference's rooms against displacement (chapter 17) before it wins.

ASK YOUR TEAM

- What's our RevPAST and ConPAST by day part?
- When two enquiries compete, who decides, on what number?

RED FLAGS

- Catering books space with no rooms check.
- Space held first come, first served.

CHAPTER 22 · BUSINESS MIX

Guest value

“Which guests should we fight to keep?”

The ones whose lifetime value is high against what it cost to win them. Price the guest as well as the night.

Know the data law where your guests live: GDPR, CCPA, PDPA, India's DPDP Act 2023. Record consent.

THE FORMULAS

$$LTV = a \times (1 + \rho \div (1 + d - \rho))$$

$$\text{Value ratio} = LTV \div CAC$$

RFM = recency, frequency, monetary, 1 to 5 each

a: annual contribution. ρ: retention. d: discount rate, 12% here.
CAC: commission, media and sales time to win the first stay.

CHAPTER 22 · ON THE SPECIMEN

A MICE planner is worth $35,000 to the hotel

GUEST	RETENTION	LTV	CAC	LTV ÷ CAC
Corporate negotiated	70%	$2,933	$44	67
MICE planner	60%	$35,000	$750	47
Brand.com leisure	30%	$444	$35	13
OTA leisure	15%	$303	$61	5
Wedding host family	25%	$1,223	$563	2

Give the OTA guest a direct-only benefit for the next stay. A returning CEO who scores 555 on RFM is never walked.

ASK YOUR TEAM

- Who are our 50 most valuable guests and planners?
- Do we know LTV and CAC by segment?

RED FLAGS

- The CRM holds names and no value.
- Marketing consent isn't recorded.

CHAPTER 23 · BUSINESS MIX

Resorts

“Does any of this change for a resort?”

The maths is the same. A resort sells stays rather than nights, and most of its money is spent after check-in.

Pull length of stay first. Then price meal plans on contribution. Then price the villa ladder on scarcity.

THE TESTS

```
MinLOS pays when
  shoulder RNs gained × rate
  > arrivals lost × their value

TRevPOR = (rooms + F&B + spa)
          ÷ occupied rooms
```

The category that sells out first is underpriced. Widen its differential until its sell-outs match the rooms below it.

CHAPTER 23 · ON THE 120-KEY RESORT

All-inclusive leaves $97 a night more than room only

PLAN	PRICE	ROOM INSIDE	CONTRIBUTION
EP, room only	$325	$325	$260
CP, breakfast	$363	$318	$281
MAP, two meals	$444	$304	$324
AP, all meals	$508	$293	$357

Report the room rate to STR net of meals, or the ARI flatters you. A peak MinLOS of 4 trades 30 lost arrivals for 210 shoulder nights.

Pool villas sell out 95 nights a year at a 180% premium: underpriced. Total revenue per occupied room is $540, and 40% of it is outside rooms.

ASK YOUR TEAM

- What MinLOS runs each season, and what did it turn away?
- Which plan earns us the most per night?

RED FLAGS

- The villas sell out first every peak.
- A meal-plan room rate reported gross to STR.

PART 6

Governance

6

24 Budget and variance

25 Running it: rhythm, systems and the prize

CHAPTER 24 · GOVERNANCE

Budget and variance

“We beat the rooms budget by $43,000. Is that good news?”

Not necessarily. Split the variance into price, volume and the joint effect. The three add up exactly to the total.

Build the budget month by month. Every point of uplift should trace to a chapter.

THE FORMULAS

```
Price  = (ADRa − ADRb) × RNb
Volume = (RNa − RNb) × ADRb
Joint  = ΔADR × ΔRN

Occ(m) = Occbase × Iocc(m) + uocc
ADR(m) = ADRbase × IADR(m)
         × (1 + uADR)
```

a: actual. b: budget. I(m): the month's seasonal index from three years of history. u: the uplift the programme commits to.

CHAPTER 24 · ON THE SPECIMEN

Ahead of budget, because rate was bought with volume

Budget: 140,640 room nights at $143.75. Actual: 135,050 at $150.02.

PART	AMOUNT
Price variance	+$881,603
Volume variance	-$803,563
Joint variance	-$35,041
Total	+$43,000

Read beside an RGI of 84, this hotel priced up into a market it was already behind. Next year, two points of occupancy and 6% on rate give $22.10m, up 9.1%.

ASK YOUR TEAM

- Split last month's variance into price, volume and joint.
- Which chapters carry next year's uplifts?

RED FLAGS

- “Ahead of budget” with RGI falling.
- A budget built as last year plus a percentage.

CHAPTER 25 · GOVERNANCE

Running it: the calendar and the systems

CADENCE	ROUTINE	OWNER
Daily	Pace for 90 nights; BAR tier, fences, MinLOS; tonight's overbooking and walk plan	Revenue manager
Weekly	Forecast by segment, group decisions, channel mix, rate shop	DOR, GM, DOSM, F&B
Monthly	STR, Net RevPAR, accuracy, variance, flow-through	DOR with Finance
Quarterly	Segment ranking, price tests, channel contracts	DOR
Yearly	RFP on displacement, budget, ladder reset, comp set	DOR, DOSM, GM

BUY IN THIS ORDER

1. Clean PMS data
2. Channel manager
3. Rate shopper
4. RMS
5. BI and CRM

DOES THE RMS PAY?

A 3% uplift is $486,000 of contribution against $75,000 a year: 6.5 times, paid back inside two months. It breaks even at 0.5%.

CHAPTER 25 · THE PRIZE

$1.63m a year, or 20.6% of this year's EBITDA

$1.54m
half the gap to fair share, as contribution

$93k
3% of nights moved from OTA to direct

INSIDE THE FAIR-SHARE LINE, NOT ADDED TO IT	A YEAR
Overbooking from 512 to 526	$178,352
Attribute selling, at the rooms margin	$434,861
Reputation 7.9 to 8.7, half realised	$363,059
BAR discipline, fences, mix and LOS	$559,378

Ask for five numbers monthly: RGI, Net RevPAR, WAPE with bias, flow-through and review score.

ASK YOUR TEAM

- Which routines happened last month, and which didn't?
- How often are RMS overrides right?
- What's our prize, on our numbers?

RED FLAGS

- No weekly revenue meeting, or one the GM skips.
- An RMS bought before the PMS data were clean.

APPENDIX A · 1 OF 2

The formula sheet

MEASURE	FORMULA	CH	SHEET
RevPAR	Occupancy × ADR, or rooms revenue ÷ rooms available	2	01
Net RevPAR	(Rooms revenue − acquisition costs) ÷ rooms available	2	01
TRevPAR, GOPPAR	Total revenue, or GOP, ÷ rooms available	2	13
Flow-through	ΔEBITDA ÷ ΔRevenue	2	13
MPI, ARI, RGI	Hotel ÷ comp set × 100, for occupancy, ADR and RevPAR	3	01
Contribution / RN	Net ADR × rooms margin + F&B per RN × F&B margin	4	02
Pickup forecast	OTB + average pickup, or OTB × average (final ÷ OTB)	5	03
Unconstrained	Rooms sold + share converting × denials	6	04
WAPE, bias, TS	Σ|A − F| ÷ ΣA; mean(A − F); Σ(A − F) ÷ MAD	7	21
Optimal price	P* = (a ÷ b + c) ÷ 2, capped at (a − C) ÷ b	9	05
BAR tier	BAR1 × (1 + step)^(n − 1)	10	06
Break-even volume	−(ΔP − ΔVC) ÷ (CM + ΔP − ΔVC)	11	22

APPENDIX A · 2 OF 2

The formula sheet, continued

MEASURE	FORMULA	CH	SHEET
Elasticity	Slope E of ln FSI on ln ARI, week by week	11	22
Price index	Own BAR ÷ comp-set median × 100	12	30
Littlewood	$y = \mu1 + \sigma1 \times \Phi^{-1}(1 - r2 \div r1)$	14	07
Bid price test	Accept if Σ rate ≥ Σ bid prices over the stay	15	08, 26
Critical fractile	Overbook room k while P(no-shows ≥ k) ≥ W ÷ (W + E)	16	09, 23
Group floor	VC − AC ÷ N + ΣΣ L(R − VC) ÷ N	17	25
Transient protection	$\mu + \sigma \times \Phi^{-1}(1 - \text{group value} \div \text{transient value})$	18	24
Net ADR by channel	ADR × (1 − cost %) − fixed cost ÷ LOS	20	11
Value per click	Contribution per booking × conversion	20	31
RevPAST	Space revenue ÷ (sq ft × sessions)	21	12
LTV	a × (1 + retention ÷ (1 + discount rate − retention))	22	32
Three-part variance	ΔADR × RNb; ΔRN × ADRb; ΔADR × ΔRN	24	14

APPENDIX B

Every chapter and its workbook sheets

1	Where RM works	20
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3	Fair share, comp set	01, 29, 30
4	Segmentation	02
5	Booking curve, pace	03
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8	Hot, warm, cold nights	21
9	Price response	05
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12	Rate shopping, parity	30
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25	Rhythm, systems, prize	19, 28, 18

Non multa, sed multum.

Revenue Management 101 for Engaged Hotel Owners · Vikram Aditya Singh

Put your own numbers in the gold cells of the workbook, then bring these questions to the next revenue meeting.