Univ.-Prof. Dr. Volker Stein

# Yield Management as an Instrument of Revenue Optimization in Free TV Advertising

IMMAA Conference, Saarbruecken, 02.07.2007

# Yield Management

- Dynamic combination of revenue/load management (prices and capacities)
- Origins: theatres (“papering the house”); deregulations of US airline industry in the 1970s (American Airlines)
- Spreading to services such as hotels, package holidays, car rentals, trains and – TV advertising
- Objective: Filling the capacities with less-than-full-price-customers without offending full payers; everybody pays the individual maximum price
- The optimization can help the Free TV provider adjust prices and to allocate free capacity among market segments to maximize expected revenues at different levels of detail (the ads of a whole week, the ads of a whole day, the ads of one block)

(Corsten & Stuhlmann 1998; Köcher 2002; Maglaras & Meissner 2006)

# Difference to Related Concepts

YM is…

… more complex than conventional price discrimination:

YM varies prices not only on product level but already for single articles; additionally: combination with quota setting; if a quota is exhausted, the corresponding rate is no longer available;
the quotas are not only coupled with measurable criteria but also with behaviors (for example, the first customers get the cheapest price; to the customers, the prices seem to increase over time)

… more flexible than price-cutting:

YM decisions to lower or raise a price often must be made quickly – sometimes within minutes of the arrival of new information; the decision will be short-term; the special offer can be withdrawn just as quickly as it is made

# Prerequisites for YM

| (Kimes 2000): | *Applicable to Free TV advertising?* |
|---|---|
| 1. Relatively fixed capacities | Maximum quantity by laws and advertising guidelines |
| 2. Predictable demand | Segmentation is possible; media agencies book far in advance |
| 3. Perishable inventory | Advertising time that is not sold is lost |
| 4. Appropriate cost and price structure | Relatively high fixed costs, low variable costs; marginal costs of additional ad spots are low for the provider; measures like scope and load factor |
| 5. Time-elastic demand | Differences in day times, seasons; but predictive, so that price variation in respect to time-related demand will be possible |

→Challenge to balance selling advertising at the highest possible rate against minimizing the amount of unsold advertising

# Apparent Relevance

And indeed:

Booking status of commercial breaks in German Free TV:

RTL: 75,1% (May 2000)

Sat.1: 75,7% (May 2000)

Pro7: 59,7% (May 2000)

(according to Köcher 2002, 181-182)

→ necessity for optimization

Public television in D:

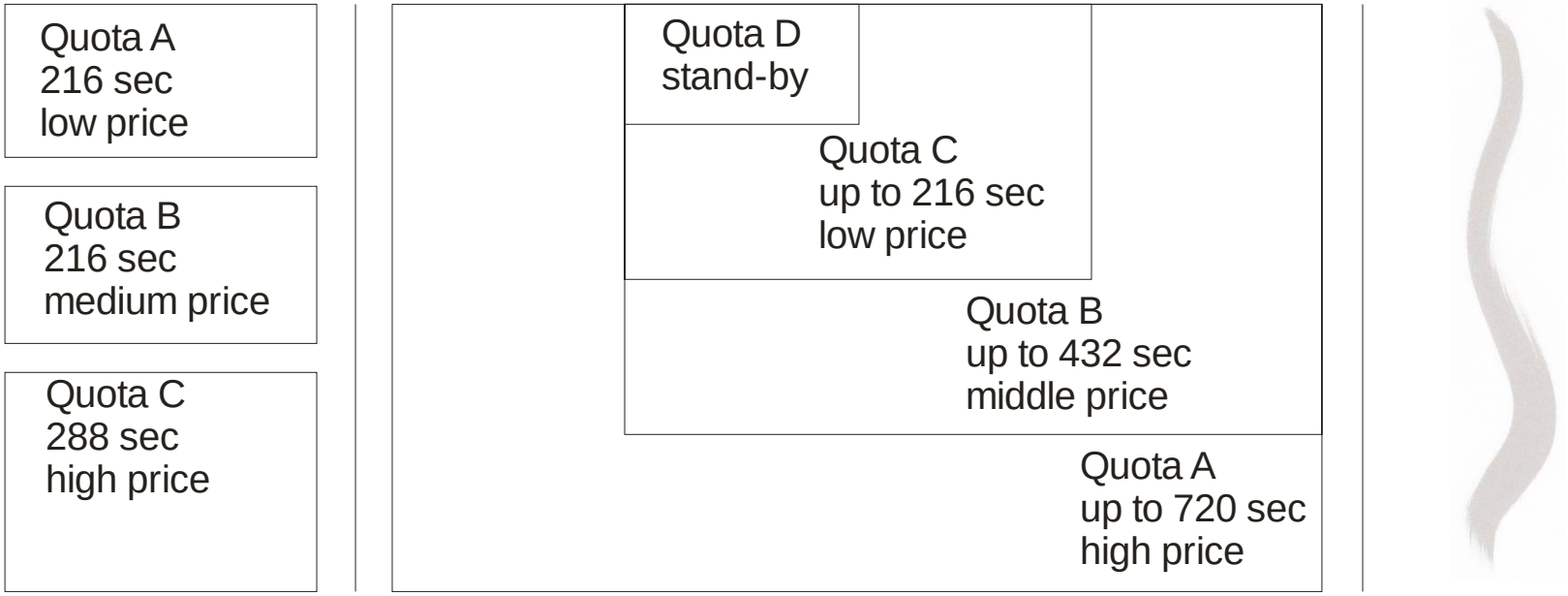
ZDF/ARD: price discrimination and quantity discounts

(but ARD: at least informal confession that they apply YM)

# YM Circular Flow

1. Experience-based analysis of known input parameters: capacity, prices (bottom price from cost accounting), utilization, demand (target group analysis), external factors (holidays, fairs)
2. Segmentation, demand forecast, quota setting of the capacities
3. Overall planning of prices and overbooking rules for the quotas for a time period (season, quarter) and specification of the related terms
4. Fine-tuned planning of prices by an IT-based optimization system
5. Price communication to concrete prospective customers; booking
6. Reservations monitoring through the use of specialized software which keeps the booking progress in a range of tolerance
7. In reaction to market development, disturbances or misjudgment: readjustment (for example, higher demand → enlarging the high-price quotas; lower demand → offering discounts)
8. Professional handling of overbooking (only possible if a fluctuation of prospective customers is given)

# Quota Setting / Booking Order Orientation




Static

Static with nesting

Dynamic

According to Köcher 2002, 199.

# Quota Setting / Target Group Orientation

Example: Super RTL

2 basic rates:
Until 4 pm: “Children 3-13”
From 8:15 pm: “Grown-ups 14-49”

4-8:15 pm: both target groups “(“twin-islands”): revenue-optimizing nesting according to demand
for example before Christmas or Easter: mostly children islands;
in the summer: more grown-up islands

This kind of quota setting is only possible because this Free TV provider focuses two target groups (limitation for transfer to other providers)

# Difficulties of YM in Free-TV Advertising

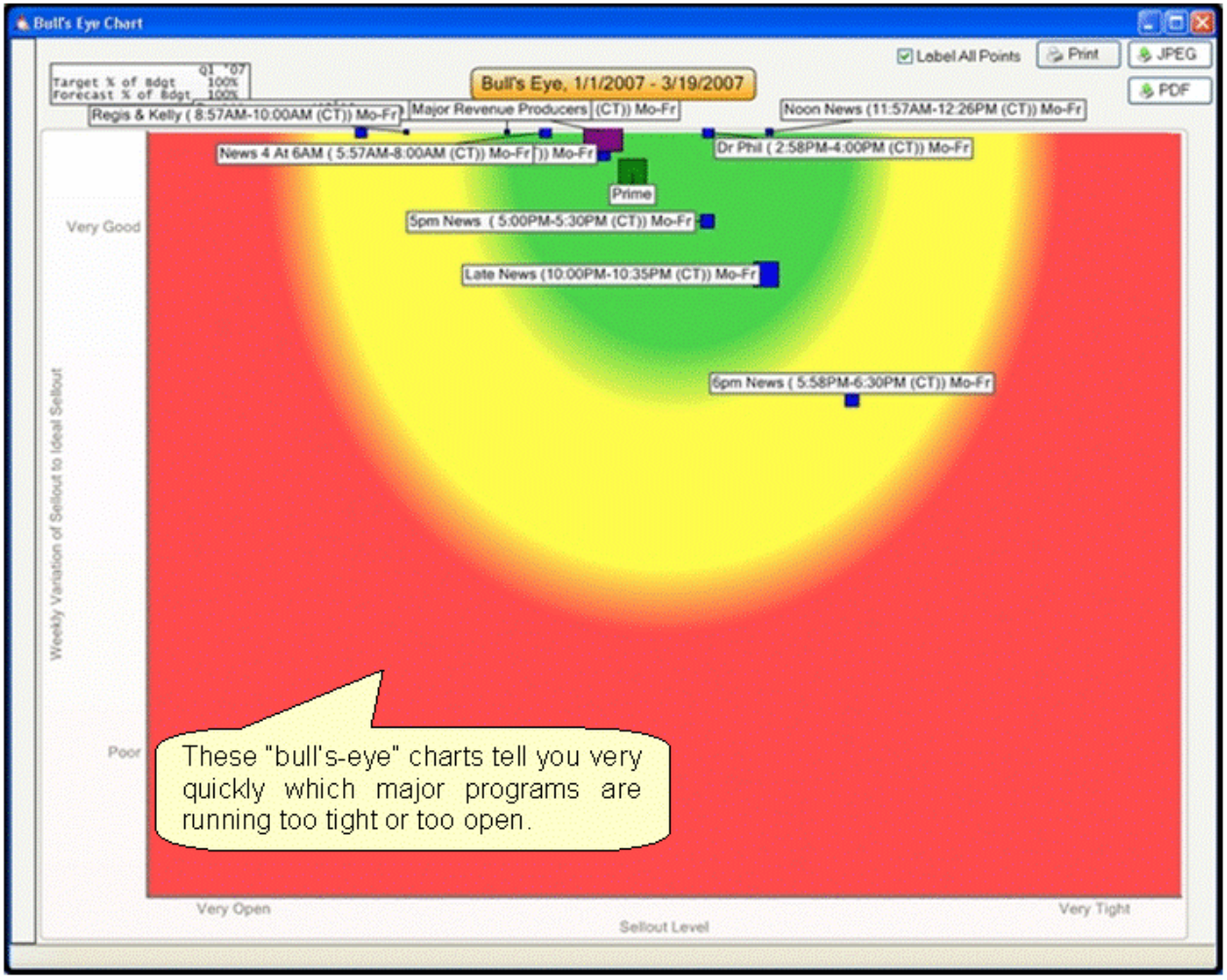
TV advertising specificity (Martin 2004): the decomposition of the offer into a lot of small TV breaks (about 10 spots only) → makes YM difficult because the critical mass of divisible time within a TV break is hardly reached

Viewer segmentation: has to be based on sound historical data; the terms of the advertising have to be matched; the past performance has to be known (sell-through rates, reservation to booking conversion rates) and has to be available real-time

Recipient overlap: the same spectator can belong to different audience groups (age; social status; …) → this has to be properly analyzed for the YM system which has to be able to prioritize sending time to users based on knowing the “booked to available ratio” of each targeting criteria

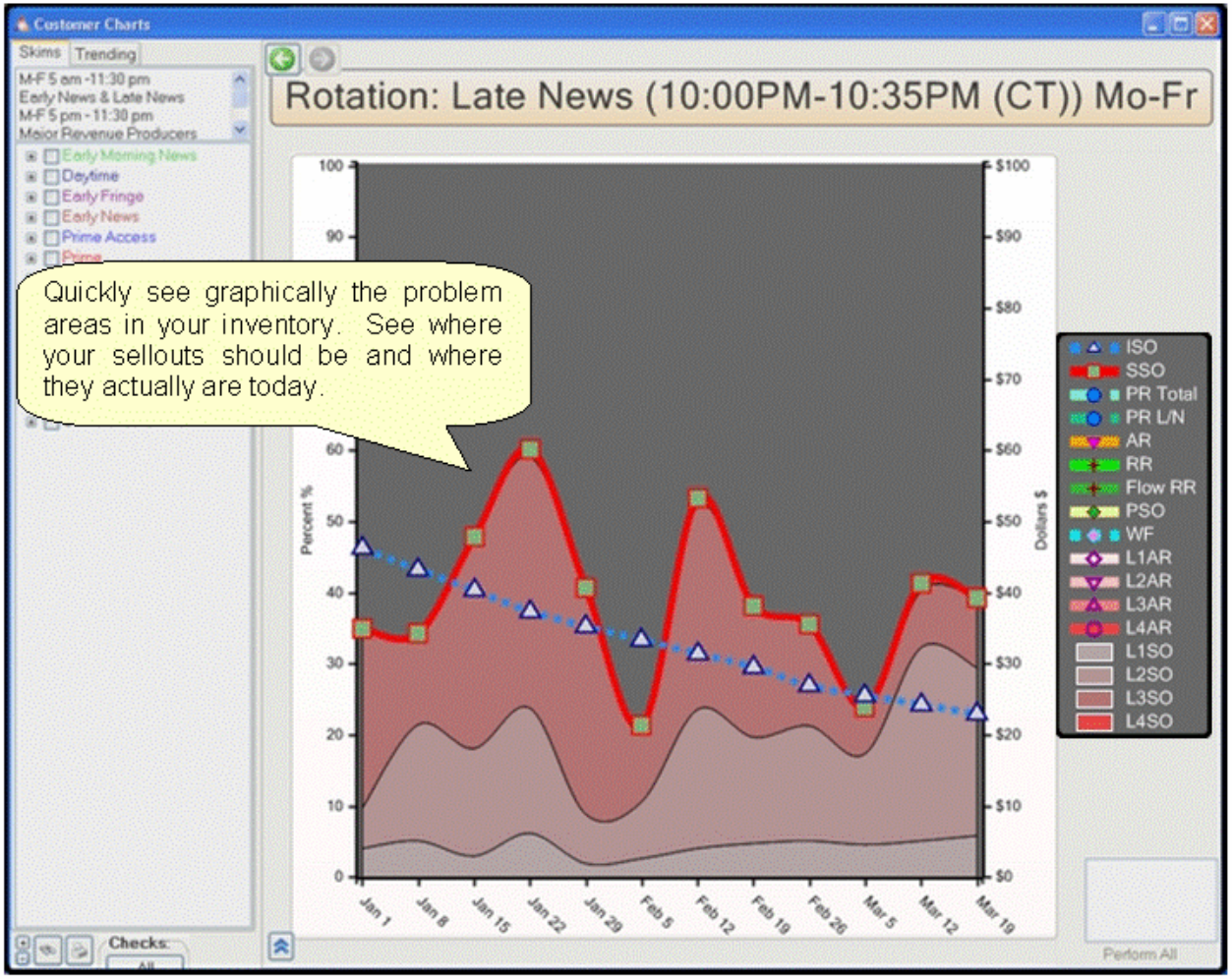
Overbooking: historical figures on cancellations must be known as calculation base for every single quota

Example “ShareBuilders”: Quick snapshots of inventory




http://wwwwww.share-builders.com/soft_tv.php

## Example “ShareBuilders”: Charting Inventory




http://wwwwww.share-builders.com/soft_tv.php

# Beneficial Effects from YM

**Demand effect:** Increase of demand by selectively introducing many more price points, as Free TV providers learn about and react to the diversity of interests and purchase drivers of their customers.

**Revenue effect:** YM maximizes or at least significantly increases revenue production for the same number of units, by taking advantage of the forecast of high demand/low demand periods, effectively shifting demand from high demand periods to low demand periods and by charging a premium for late bookings.

**Price structure effect:** Prices are lowered for the majority of the advertising times because Free TV providers offer far higher discounts more frequently for off-peak times, while raising prices only marginally for peak times, resulting, however, in higher revenue overall.

**Liquidity effect:** While YM systems tend to generate higher revenues, the revenue streams tend to arrive later in the booking horizon as more capacity is held for late sale at premium prices.

**Customer satisfaction effect:** Increase of customer happiness when they see a “full house” around them.

# Challenges

**Forecasting demands:** difficult when special treatment for a particular customer segment is only short-dated

**Estimating price sensitivity:** hard to estimate willingness of large number of people to pay, even with coarse segmentation

**Keeping markets separate:** low-priced option needs to be “fenced off”, i.e. made unattractive, unavailable, perhaps even unknown to high spenders – to save them from slipping

**Not overdoing it:** maximizing revenue or just operating at full capacity? If the capacity is filled too quickly, maybe some would have willingly paid more for what they purchased for less

**Coordinating the deals:** too many deals become difficult to manage and confusing for staff and customers alike; likelihood of overlap is high, everyone becomes eligible for one offer or another

**Avoiding disgruntlement:** ensure only those eligible for the special price receive the promotional material; reduce opportunities for customer interaction; offer higher margin customers extra terms

# Further Implications

For marketing:

- Generally: integration of YM in marketing activities
- Price policy: link to product differentiation, especially in respect to intangible characteristics of the offer which prevent potential cannibalization effects (terms like advance order time, minimum purchasing quantities, cancellation policies)
- Communication policy: general information about YM system; targeted offers for different customer segments

For HRM:

- Development of the front-office employees: communication skills, data issue management
- Motivation: job design, incentive systems

# Lessons Learnt

YM…

… is relevant because of free ad capacities and flexibility necessities of the customers (TV is an attractive medium just because time buys can be made on a last minute basis)

… optimizes revenue margins for the TV providers

… is conceptually advanced (successful diffusion among service industries)

… is better and better applicable (available IT support)

… contributes to a paradigmatic change in performance management of media enterprises (strengthening of market coordination)

… supports an intrafirm mental shift towards a more competitive behavior (pay-for-performance)

→ YM still seems to gain relevance for revenue optimization!

# References


Corsten, H., & Stuhlmann, S. (1998): *Yield Management – Ein Ansatz zur Kapazitätsplanung und -steuerung in Dienstleistungsunternehmungen*. Discussion Paper No. 18, Lehrstuhl für Produktionswirtschaft, University of Kaiserslautern.

Kimes, S.E. (2000): A Strategic Approach to Yield Management. McMahon-Beattie, U./Yeoman, I. (Eds.): *Yield Management. Strategies for the Service Industries*, 2 ed., London, 3-14.

Köcher, A. (2002): *Controlling der werbefinanzierten Medienunternehmung*. Lohmar, Köln.

Maglaras, C., & Meissner, J. (2006): Dynamic Pricing Strategies for Multiproduct Revenue Management Problems. *Manufacturing & Service Operations Management* 8 (2), 136-148.

Martin, B. (2004): Combinatorial Aspects of Yield Management, a Reinforcement Learning Approach. *Proceedings of The 2004 European Simulation and Modelling Conference ESM2004*, Analytical and Stochastic Modelling Techniques and Applications ASMTA'04, Magdeburg, Germany, 2004, www.brunomartin.org/YM.html.