

ORIE 6154 - Pricing and Revenue Management

Instructor: Siddhartha Banerjee

Semester: Fall 2016

August 23, 2016

Essential Course Information

Instructor

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Office hours: W 2pm-4pm (or by appointment)

Essential Course Information (contd.)

Lectures

Course Number: ORIE 6154

Class time: TR 1:25-2:40pm

Class location: Philips 307

Course Communication:

Website: <http://people.orie.cornell.edu/sbanerjee/ORIE6154/orie6154f16.html>

BlackBoard for all announcements (search for ORIE 6154)

What is Revenue Management?

Pricing and Revenue Optimization

“...application of analytics to predict consumer behavior and optimize product availability, and price to maximize revenue...”

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Selling the **right product** to the **right customer**
at the **right time** for the **right price**

What is Revenue Management?

A canonical example

What is RM?



- Consider the decisions faced in selling a house?
 - When should we put it on the market?
 - What price should we ask?
 - Given an offer, should we accept it?
 - If there are no offers, should we lower the asking price? If so, by how much? When?

Courtesy: Huseyin Topaloglu

What is Revenue Management?

Optimizing a firm's "interface with the market"

- Selling formats: auctions, negotiations, posted prices

- Demand estimation/learning

- Capacity control of scarce resources

- Dynamic pricing and price discrimination

- Choice modeling; segmentation; assortment optimization

- Multiple products and markets

- Competition with other firms

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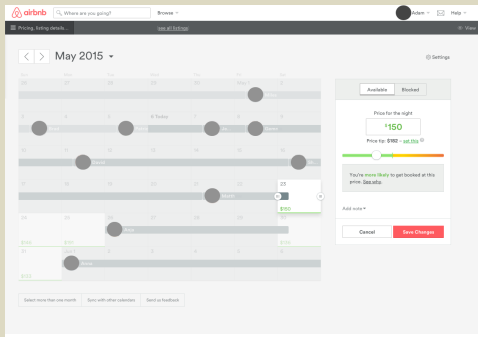
Competition with other firms

Complementary to Supply-Chain Management

Concerned with minimizing production costs

Why study RM now?

Canonical example ++



Courtesy: www.guesty.com

Travel trends in your area are changing.



You can take advantage of these changes by adjusting your price on a daily basis. Over time, this can help you make more money.

See Price Tips for May

Price tips will next update tomorrow

Why study RM now?

Advances in technology

- Automated transactions

- Better monitoring tools and extensive data

- More fine-grained market control

New application settings

Advances in methodology

- Better learning and estimation techniques

- Rich and growing toolbox for decision making

Revenue Management vs. Market Design

RM studies design decisions of a monopolist seller

- Capacity/pricing/segmentation decisions

- Price-taking buyers/exogenous demand models

- Competition with other firms

Market design considers optimization of the overall marketplace

- How market rules affect buyer/seller equilibrium

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- Point-to-point pricing for car2go: revenue management
Dynamic pricing in Uber/Lyft: market design

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- AirBnB Reputation mechanisms: market design
AirBnB price recommendation tool: revenue management (?)

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ORIE 6154: Revenue Management, ORIE 6180: Market Design

Course Structure

Mix of **lectures** (for initial fundamentals), **seminar-style discussions** (for more recent developments).

4 assignments +1 prelim

Final **project**

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Final **project**

Prerequisites:

Probability and **stochastic processes**: at the level of ORIE 6500

Optimization: at the level of ORIE 6300

Microeconomics, **game theory**, **algorithms**: useful, but not required

Warmup (and some history)

The creation story: RM in the Airline Industry

- **Airline Deregulation Act (1978):** No price regulations, free market entry

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- New low-cost carriers: **People Express (1981)**
- American Airlines respond with **Super-Saver Fares (1978)**
 - 30-days advance purchase, business vs. leisure (**price discrimination**)
 - Few seats at discounted price (**capacity control**)
 - **DINAMO** - Dynamic Inventory Allocation and Maintenance Optimizer

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 - **DINAMO** - Dynamic Inventory Allocation and Maintenance Optimizer
- Note: Not a **price war**; better revenue management

RM in the Airline Industry

Results of the New Strategy

- AMR shares initially plunged on announcement of “Ultimate Super Saver” fares Jan. 1985
 - Analysts thought it was the start of a price war
 - “American cannot operate profitably at these fares”
- DINAMO proved to be surprisingly effective
 - AA total revenues rose
 - Competitors suffered: e.g. People Express
 - 1984 \$60M profit (all-time high)
 - 1985 \$160M loss
 - 1986 Bankruptcy, sold to Continental

← DINAMO

Courtesy: Huseyin Topaloglu

RM in the Airline Industry

The Multiple Fare-Class Capacity Allocation Problem

So what did American Airlines do?