An Overview on Revenue Management: E-Commerce Perspective

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Abstract

• Businesses are facing important decisions regarding what to sell, when to sell, to whom to sell, and for how much. One solution for making the right decisions for increasing revenue is to employ revenue management. The primary goal of Revenue Management is selling the right product to the right customer at the right time for the right price.

• In this talk, an overview of revenue management with Electronic Commerce perspective is introduced. Revenue management and its relationship of improving/sustaining competitive advantage is also presented.

Outline

• Introduction
• Business Models and Evolutions of Economy
• Value Creation/Innovation
  – Red vs. Blue Ocean Strategy
• Examples/applications of revenue management
• Major Revenue Management Problems
• Future Research
• Conclusion

Why Research? Publish or Perish

• Career development
• Professional development
• Personal development

Business Scenario

• The Marketing Communication manager is a genius. Response to promotion is the best you ever had.
  Too bad potential customers are more interested the advertising than the product.
• You have a whiz in manufacturing. The output rate is way above what anybody could do before.
  Too bad your warehouse is full of inventory that nobody wants.
• Your financial manager is amazing. Imagine being able to determine an internal rate of return without a calculator.
  Too bad that the only advice this person knows is, “increase the price, we need more profit.”
• Your marketing manager is a jewel. Order are up by 30%.
  Too bad the products have no margin, and manufacturing doesn’t know how to build the stuff.

Ultimate Objective is …

• The business will not succeed without proper attention to these areas.
• But, the business will not succeed if attention is placed only on these areas.
• The ultimate objective of every business manager, no matter what the function or management designation, should be to aim for overall business success
Industry Profitability, 1981-2001

<table>
<thead>
<tr>
<th>Industry</th>
<th>ROE</th>
<th>ROA</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Pharmaceuticals</td>
<td>25.87%</td>
<td>10.27%</td>
</tr>
<tr>
<td>2. Chemicals and allied products</td>
<td>21.70%</td>
<td>7.88%</td>
</tr>
<tr>
<td>3. Food and kindred products</td>
<td>24.78%</td>
<td>7.25%</td>
</tr>
<tr>
<td>4. Printing and publishing</td>
<td>16.30%</td>
<td>6.68%</td>
</tr>
<tr>
<td>5. Rubber and miscellaneous plastic</td>
<td>15.07%</td>
<td>6.25%</td>
</tr>
<tr>
<td>6. Fabricated metal products</td>
<td>19.00%</td>
<td>5.58%</td>
</tr>
<tr>
<td>7. Paper and allied products</td>
<td>13.77%</td>
<td>4.70%</td>
</tr>
<tr>
<td>8. Electronics and electrical equipment (no computers)</td>
<td>9.63%</td>
<td>4.67%</td>
</tr>
<tr>
<td>9. Nonferrous metals</td>
<td>10.39%</td>
<td>4.23%</td>
</tr>
<tr>
<td>10. Machinery, except-electrical</td>
<td>15.60%</td>
<td>5.80%</td>
</tr>
<tr>
<td>11. Petroleum and coal products</td>
<td>13.25%</td>
<td>3.76%</td>
</tr>
<tr>
<td>12. Textile mill products</td>
<td>5.11%</td>
<td>3.71%</td>
</tr>
<tr>
<td>13. Aircraft, guided missiles, and parts</td>
<td>14.02%</td>
<td>3.57%</td>
</tr>
<tr>
<td>14. Stone, clay, and glass products</td>
<td>9.16%</td>
<td>3.44%</td>
</tr>
<tr>
<td>15. Motor vehicles and equipment</td>
<td>11.91%</td>
<td>3.16%</td>
</tr>
<tr>
<td>16. Iron and steel</td>
<td>6.40%</td>
<td>3.14%</td>
</tr>
<tr>
<td>17. Airlines (transportation by air)</td>
<td>2.68%</td>
<td>2.05%</td>
</tr>
</tbody>
</table>


Firm Profitability, 1981-2001

<table>
<thead>
<tr>
<th>Firm</th>
<th>ROA</th>
<th>Firm</th>
<th>ROA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pharmaceuticals</td>
<td></td>
<td>Airlines</td>
<td></td>
</tr>
<tr>
<td>Bristol Myers Squibb</td>
<td>13.71%</td>
<td>Southwest Airlines</td>
<td>4.85%</td>
</tr>
<tr>
<td>Merck</td>
<td>13.37</td>
<td>AMR</td>
<td>1.51</td>
</tr>
<tr>
<td>Schering Plough</td>
<td>12.89</td>
<td>Delta Airlines</td>
<td>1.50</td>
</tr>
<tr>
<td>WYETH American Home Products</td>
<td>12.52</td>
<td>UAL</td>
<td>0.96</td>
</tr>
<tr>
<td>Eli Lilly</td>
<td>10.23</td>
<td>US Air</td>
<td>0.31</td>
</tr>
<tr>
<td>Pfizer</td>
<td>9.66</td>
<td>America West Holdings</td>
<td>-3.27</td>
</tr>
<tr>
<td>Pharmacia &amp; Upjohn</td>
<td>7.98</td>
<td>Continental Airlines</td>
<td>-4.97</td>
</tr>
<tr>
<td>American Cyanamid</td>
<td>3.57</td>
<td>TWA</td>
<td>-5.37</td>
</tr>
<tr>
<td>North Carolina Airlines</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Northwest Airlines</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Source: Compustat.

Determinants of Profitability

WHY?

Business Models

What Else?

Essential Value Propositions for a Successful Company

- **Business Model**
- **Core Competency**
- **Execution**
  - Set corporate goals and get executive sponsorship for the initiative

The Evolutions of Economy

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Product/Service</td>
<td>Information/Internet</td>
<td>Knowledge</td>
</tr>
<tr>
<td>Market share</td>
<td>Time to market/ Site visitation</td>
<td>Wallet share/ Profit</td>
</tr>
<tr>
<td>Economies of Scale/ Efficiency</td>
<td>Technology Improvement</td>
<td>Retaining customers/ Win service</td>
</tr>
</tbody>
</table>

Relationship between profits and time of market introduction

- Profits relative to competition (%)
- Time of market introduction relative to competition (months)
- Is timing for market entry really important?
The Profit and Growth Consequences of Creating Blue Oceans

<table>
<thead>
<tr>
<th></th>
<th>Launches within red oceans</th>
<th>Launches for creating blue oceans</th>
</tr>
</thead>
<tbody>
<tr>
<td>Business launch</td>
<td>86%</td>
<td>14%</td>
</tr>
<tr>
<td>Revenue Impact</td>
<td>62%</td>
<td>38%</td>
</tr>
<tr>
<td>Profit Impact</td>
<td>39%</td>
<td>61%</td>
</tr>
</tbody>
</table>

Revenue Management (a.k.a. yield management)

開源或節流？

Introduction

- What is “Revenue Management”? Design service packages for different market segments using appropriate combinations of attributes such as price, amenities, purchase restrictions, and distribution channel so that the revenue of the organization is maximized.
- History of Revenue Management
  - Can be traced back 40 years
  - Prevalent after the Airline Deregulation Act of 1978

Revenue Management (RM)

- RM focuses companies on revenue growth, not cost-cutting and downsizing.
- RM drives bottom-line increases through top-line improvements.
- Growth comes from the marketplace, not the workforce.
- The key to real growth is learning how to deal effectively and proactively with a constantly changing markets.

USA Companies …

<table>
<thead>
<tr>
<th>Every (Years)</th>
<th>Lost</th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
<td>½ Customers</td>
</tr>
<tr>
<td>4</td>
<td>½ Employees</td>
</tr>
<tr>
<td>1</td>
<td>½ Investors</td>
</tr>
</tbody>
</table>
Revenue Management (RM) vs. MIS

- MIS is to deliver
  - the right information, to the right people
  - at the right time, with the right form
- RM is to sell
  - the right product, to the right customer
  - at the right time, for the right price
  - Thereby maximizing revenue from a company’s products

Examples on Revenue Management

- A No-Tech approach to RM
  - Barbershop
- A Low-Tech approach to RM
  - Opera House
- A High-Tech approach to RM
  - Airlines

Other Examples

- Hotel
- Car rental
- Golf
- Broadcasting
- Shipping
- Restaurant
- Etc.

How about in Taiwan?

因應競爭台鐵擬採
彈性票價

Some U.S. airline industry observations

- Since deregulation (1978) 137 carriers have filed for bankruptcy.
- From 95-99 (the industry’s best 5 years ever) airlines earned 3.5 cents on each dollar of sales:
  - The US average for all industries is around 6 cents.
  - From 90-99 the industry earned 1 cent per $ of sales.
- Carriers typically fill 72.4% of seats and have a break-even load of 70.4%.

Which Industry Can Use Revenue management

- The same unit of capacity (e.g., airline seat) can be used to deliver services to different customer segments (e.g., business and leisure customers) at different prices.
- Perishable capacity (it cannot be stored) and limited capacity (all possible customers cannot always be served).
- Capacity is sold in advance of demand.
- There is an opportunity to segment customers (so that different prices can be charged) and different segments are willing to pay different prices.
- It is not illegal or morally irresponsible to discriminate among customers.

Revenue management and margin arithmetic

Small changes in revenue can have a big impact on profit, especially for high gross margin and low net profit % industries:

<table>
<thead>
<tr>
<th>Gross margin</th>
<th>Revenue increase 1%</th>
<th>Revenue increase 2%</th>
<th>Revenue increase 5%</th>
<th>Revenue increase 8%</th>
</tr>
</thead>
<tbody>
<tr>
<td>10%</td>
<td>90%</td>
<td>90%</td>
<td>90%</td>
<td>90%</td>
</tr>
<tr>
<td>25%</td>
<td>75%</td>
<td>75%</td>
<td>75%</td>
<td>75%</td>
</tr>
<tr>
<td>50%</td>
<td>50%</td>
<td>50%</td>
<td>50%</td>
<td>50%</td>
</tr>
<tr>
<td>75%</td>
<td>25%</td>
<td>25%</td>
<td>25%</td>
<td>25%</td>
</tr>
<tr>
<td>100%</td>
<td>0%</td>
<td>0%</td>
<td>0%</td>
<td>0%</td>
</tr>
</tbody>
</table>

Net profit % = 2%

<table>
<thead>
<tr>
<th>Gross margin</th>
<th>Revenue increase 1%</th>
<th>Revenue increase 2%</th>
<th>Revenue increase 5%</th>
<th>Revenue increase 8%</th>
</tr>
</thead>
<tbody>
<tr>
<td>10%</td>
<td>17%</td>
<td>17%</td>
<td>17%</td>
<td>17%</td>
</tr>
<tr>
<td>25%</td>
<td>8%</td>
<td>8%</td>
<td>8%</td>
<td>8%</td>
</tr>
<tr>
<td>50%</td>
<td>3%</td>
<td>3%</td>
<td>3%</td>
<td>3%</td>
</tr>
<tr>
<td>75%</td>
<td>1%</td>
<td>1%</td>
<td>1%</td>
<td>1%</td>
</tr>
<tr>
<td>100%</td>
<td>0%</td>
<td>0%</td>
<td>0%</td>
<td>0%</td>
</tr>
</tbody>
</table>

Net profit % = 6%
Matching supply to demand when supply is fixed

• Examples of fixed supply:
  – Travel industries (fixed number of seats, rooms, cars, etc).
  – Advertising time (limited number of time slots).
  – Telecommunications bandwidth.
  – Size of the MBA program.
  – Doctor’s availability for appointments.

• Revenue management is a solution:
  – If adjusting supply is impossible – adjust the demand!
  – Segment customers into high willingness to pay and low willingness to pay.
  – Limit the number of tickets sold at a low price, i.e., control the average price by changing the mix of customers.

The Application of Revenue Management in Traditional Industries

• Airlines
  Application: Provide business class, economy class; adjust prices frequently according to demand; provide more tickets than seats to avoid cancellation and no-show

• Hotels
  Application: Provide special rate packages for periods of low occupancy; use overbooking policy to compensate for cancellation, no-shows

• Rental cars
  Application: Adjust prices frequently according to demand; serve high-valued fleet utilization with priority; accept or reject booking requests based on length of rent controls.

The Application of Revenue Management in Non-traditional Industries

| Hospitality organizations | Restaurants, Hospital and health care, Attractions, Cruise lines and ferry lines, Casinos, Saunas, Resort, Golf, Entertainment events, Sports events, Conference |
| Transportation-related industries | Boat, Railways, Cargo and Freight |
| Subscription services | IT Services and Internet Services, Cellular network services, TV services |
| Miscellaneous | Retailing, Manufacturing, Broadcasting and Media, Natural gas, petroleum storage and transmission, Project management, Apartment renting, Sales management, Supply chain management, Inclusive holiday industry, Nonprofit sector |

Observations

• Revenue management and overbooking give demand flexibility where supply flexibility is not possible.

• Concept and powerful tools to improve revenue:
  – American Airlines estimated a benefit of $1.5B over 3 years.
  – National Car Rental faced liquidation in 1993 but improved via yield management techniques.
  – Delta Airlines credits yield management with $300M in additional revenue annually (about 2% of year 2000 revenue.)

E-Commerce Implications

• What are the implications from E-Commerce?
  – Pricing
    • Dynamic pricing
  – Supply Chain Management
    • Integrated SCM system for timely delivery and revenue improvement
  – Market segmentation
    • Fencing
  – Others?

Revenue Management Problems

• Pricing
  – Determine the price for various customer groups and vary prices over time to maximize revenues or profits

• Auctions
  – A special dynamic pricing method that acquire great popularity in recent years with the prevalence of the Internet

• Capacity Control
  – Single-resource Capacity Control
    Allocate capacity of a resource to different classes of customers so that the expected revenue or profit is maximized
  – Network Capacity Control
    Allocate capacity of a bundle of different resources to different classes of customers so that the expected revenue or profit is maximized

• Overbooking Control
  – Increasing the total volume of sales by selling reservations above capacity to compensate for cancellations and no-shows.

• Forecasting
  – Forecast demand, capacity, and price
Revenue Management Problems

- Other Issues
  - Economics
    - Supply and demand, Opportunity cost, Competition, Consolidation and alliance
  - Customer behavior and perception
    - Are revenue management practices fair? Legal?
      - Customer’s reaction to revenue management practices
  - Market segment
    - Fencing: keep market segments separated to prevent demand spillover from high priced segments to low priced ones
  - Development and implementation
    - Implementation approaches, Concerns in implementation, Roles of revenue manager
  - Performance evaluation
    - Evaluation the benefits caused by revenue management practices
  - Operations Research Techniques

Problems for Future Research

- Application in non-traditional industries
  - The assumptions under revenue management must be relaxed
- Integration with new technologies
  - Internet, E-Commerce, Integrated Internet Marketing, Auctions
- Impact of competition and alliance
  - Most current research assumes an independent environment, which is unrealistic
- Forecasting
  - Achieve a higher level of forecasting accuracy
  - Develop new forecasting methods to meet the changing environment

The Seven Core Concepts of Revenue Management

1. Focus on **price** rather than **costs** when balancing supply and demand.
2. Replace cost-based pricing with **market** -based pricing.
3. Sell to **segmented**, micro markets, not to mass market.
4. Save your products for your most valuable customers.
5. Make decisions based on knowledge, not supposition.
6. Exploit each product’s value circle.
7. Continually reevaluate your revenue opportunities.

Future Readings

- Books Focus on Revenue Management
  - **Yield Management: Strategies for the Service Industries** (2000) by Anthony Ingold, Una McMahon-Beattie and Ian Yeoman’s
  - **The Theory and Practice of Revenue Management** (2004) by Kalyan Talluri and Garrett van Ryzin
  - **Pricing and Revenue Optimization** (2005) by Robert Philips

Conclusions

- The revenue strategy decision is one of the most critical in running a business.
- Revenue management has a wide application potential in service sector
- The application of revenue management has achieved great success in many industries
- The research on revenue management will continue.
- The difference between a proper and improper revenue strategy can be the difference between **success and failure** for the entire business.

Revenue Management

- If you are interested in the issues of RM
- **International Journal of Revenue Management**
- [http://www.inderscience.com/ijrm](http://www.inderscience.com/ijrm)
The twenty-first century will witness only two kinds of companies:

- those that exploit Information Technology (IT) and/or with RM strategy
- those that are **out of business**

Source: Quality Information and Knowledge, Huang et. al., Prentice Hall

THANK YOU!

- Q/A