An Introduction to Analytics
7th February, IIT Kanpur
Who am I?

- Encore Capital Group  
  Assistant Vice President  
  May 2008 - Current

- Prudential Plc.  
  Management Trainee → Analyst → Assistant Manager  

- Corporate Executive Board  
  Research Associate  
  Jul 2005 - Oct 2005

- B.Tech (MME), Class of 2005, IIT Kanpur
What is Analytics?

"The science of analysis"

Helps an entity (i.e. business) to arrive at an optimal or realistic decision based on existing data.

Study of business data using statistical analysis in order to discover and understand historical patterns with an eye to predicting and improving business performance.
One of the highest value added off-shore services

Rapid growth in India in the recent past

Several companies have set up captive analytics centers

Many third party companies have aggressive plans for growth

The industry is expected to grow rapidly over the next few years

You have the opportunity to get a head start on the next big thing!
Pan-Industry Application

- Marketing & Customer Analytics
- Finance & Investment Analytics
- Operations Analytics
- Risk Management Analytics

Healthcare
Marketing
Banking
Insurance
Operations
Credit Cards
Retail
Investments
Human Resources
Diversified financial services
Firms in the industry

- **Internal Analytics team**
  - American Express
  - Citibank
  - HSBC
  - Standard Chartered
  - Hewitt
  - HP
  - Fidelity
  - Amazon
  - Dell
  - RCI
  - Meritus
  - Prudential
  - ZS Associates
  - Barclays

- **Full-fledged Analytics firms**
  - Inductis
  - Fractal Analytics
  - Fair Issac
  - Modelytics
  - Marketics
  - dunnhumby
  - Evaluerves
  - Kairoleaf
  - Cequity
  - AbsolutData
  - Mu-sigma
  - Symphony
  - Genpact
Typical Tools and Techniques Used

- Techniques
  - Data Mining
  - Predictive Modeling
  - Time Series
  - Text Mining

- BI Tools/ Platforms
  - SAS, SPSS, ILog-Ciplex, MATLAB
  - VBA, Access, Excel, SQL, SYBASE
  - Classification and Regression Trees (CART), MARS
developed a capability to effectively detect and manage application fraud for a top five consumer credit card issuer faced with growing application fraud losses

**Background**

**Situation**
- Top 5 consumer card issuer facing significant and increasing losses due to application fraud

**Fraud Losses in New Accounts**
- Counterfeit: 7%
- Skimmed: 2%
- Mail/Phone: 16%
- Online Order: 4%
- Non-Receipt: 7%
- Takeover: 11%
- Lost/Stolen: 17%
- Application Fraud: 46%

**Objectives**
- Develop a fraud detection capability to identify high risk accounts effectively i.e. within the first few transactions

**Approach**

Our approach focuses on developing spend patterns using information in the first three transactions; like spend type, amount, time / location and scoring patterns based on fraud propensity

**Pattern Fraud Score**
- Attributes
  - Merchant e.g. Wal-Mart
  - SIC e.g. Gas Station
  - Anonymity e.g. Signed vs. Unsigned
- Pattern Coding
  - Type
    - Size e.g. < $10, 10-100
    - Unique e.g., $1, $20, $40, $101.5
  - Amount
    - $1
  - Time
    - Activation time
    - Time between transactions
  - Location
    - Proximity to account address
    - Proximity of spend locations
- Scoring (Based on Fraud Rate)
  - A1C1E: 900
  - E1E4A: 890
  - A1E4A: 860
  - A1A3A: 780
  - E1A4E: 700
  - B1B1B: 680
  - D1D4E: 669
  - E1010: 678
  - D4B1D: 567
  - D4D1D: 564
  - D1D10: 340

**Impact**

Pattern Fraud Score yields improved lift of over 300% over Falcon Score in identifying Application Fraud within the first three transactions

**Lorenz Curves**
- Lift Comparison
  - At 1%
  - 300% improvement
  - 48% improvement

**Case Study 1: Credit Card Application Fraud Solution**
## Case Study 2: Top UK Insurer facing fluctuation in sales

Regional Sales units (RSUs) of a top insurer showed wide variation in sales achieved. We needed to unearth reasons why some RSUs are more successful than others.

### Factors

<table>
<thead>
<tr>
<th>Factors</th>
<th>Avg. for Top 10 RSU</th>
<th>Avg. for Bottom 10 RSU</th>
<th>Correlation Coefficient (Pearson) Vs % Against Target</th>
<th>Correlation Coefficient (Kendall) Vs % Against Target</th>
</tr>
</thead>
<tbody>
<tr>
<td>Conversion Rate</td>
<td>7.1%</td>
<td>2.6%</td>
<td>0.56</td>
<td>0.40</td>
</tr>
<tr>
<td>Total Qualification level</td>
<td>13</td>
<td>7.7</td>
<td>0.47</td>
<td>0.33</td>
</tr>
<tr>
<td>RAM’s Experience</td>
<td>7.4</td>
<td>2.3</td>
<td>0.45</td>
<td>0.30</td>
</tr>
<tr>
<td>Meetings made</td>
<td>401</td>
<td>283</td>
<td>0.50</td>
<td>0.36</td>
</tr>
</tbody>
</table>
Why Analytics?

- Business understanding
- Extension of your logical skills
- High remuneration
- Ability to move to different industries
- Young, high energy industry
- MS/MBA?
- Travel internationally
Hierarchy/Career Progression

Analyst (Management Trainee)
  ↓  2 years
Senior Analyst (Analyst)
  ↓  1-2 years
Lead Analyst (Assistant Manager)
  ↓  1-2 years
Manager
  ↓  Variable
Senior Manager
  ↓
VP, SVP, Director, Executive Director, Managing Director, CEO and so on!!!
Interested?
How to Prepare

- Aptitude questions
- Puzzles
- Guesstimation case studies
- General consulting case studies
- Know the firm. Know the job.
Q&A