Module II Overview

PLANNING: Things to Know BEFORE You Start...

- Why SEM? Goal Analysis
  - How good is my site? Site Analysis
  - How good is my search? Measure SEM performance
  - How to do it? Strategic Planning
  - How to sell it? SEM Proposal
If you can’t measure, you can’t manage

In this section, we discuss:

- How to diagnose a web site’s well being using multiple performance metrics [notice not just HOW, but HOW WELL!!]
  - Counting visitors
  - Conversion Rate
  - Counting dollars
  - And more…

- How to measure web site performance based on your goals

- Tools that help your web analytical needs
Metric 1: # of Visits / Visitors

- **Cookie**: a piece of text that a Web server can store on a user's hard disk. The pieces of information are stored as **name-value pairs**
  - By using cookie, servers store the state of your machine

- **Session**: theoretically, one visit paid by the customer to your web site
  - Technically, hard to accurately measure
  - Often session = visit in SEM context

```bash
session-id-time
1159167600l
amazon.com/
```
Metric 1: # of Visits / Visitors

- **Number of visits:**
  the number of unique sessions as counted by the server

- **Number of unique visitors:**
  the number of unique machine IDs that visited the server

- Both were actively used to measure site performance around 2000
Metric 1: # of Visits / Visitors

- Issues with visits / unique visitor
  - Issue with session
  - How unique is “unique”? 

- Financial analysts have become increasingly skeptical of non-financial metrics [Gupta et al. 2004]
Metric 2: Stickiness - Related

- Visit duration / page views
- Textbook (as well as Brian 😊) explains in detail how page views are counted
  - Simple log for each requested file (but file ≠ page)
  - Heuristics to solve the problem (but distributed environment!)
  - Single pixel tracking

- Stickiness = average duration / page view
Metric 2: Stickiness - Related

- **Conventional wisdom** suggests stickiness to be a valuable metrics
  - Reflects high loyalty
  - Implicates higher likelihood to purchase

- **Page views** offer some explanatory power but do not appear affecting firms’ net incomes [Trueman et al. 2000]

- **Stickiness** is capable of explaining the share price of Internet firms [Demers and Lev 2001]
Metric 2: Stickiness - Related

- Positive relationship between stickiness and purchase [Wu et al. 2005]

- Positive relationship between stickiness and conversion [Lin et al, 2006]
  - Duration significant for experience goods
  - Page views significant for search goods
Solving Measurement Issues

- Server – side solution vs. Client – side solution
  - Companies could invest in technology and build stronger server side monitoring programs (limitations exist)
  - Or they could buy service from companies such as comScore to get client-side monitoring capability

<table>
<thead>
<tr>
<th>Metric</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total number of participating households</td>
<td>100,000</td>
</tr>
<tr>
<td>Total number of website visits</td>
<td>213,356,003</td>
</tr>
<tr>
<td>Total number of online purchases made</td>
<td>342,706</td>
</tr>
<tr>
<td>Total number of online purchases made in shopping websites</td>
<td>174,990</td>
</tr>
<tr>
<td>Total number of websites visited</td>
<td>1,392,713</td>
</tr>
<tr>
<td>Total number of websites belonging to shopping category</td>
<td>46,942</td>
</tr>
<tr>
<td>Total number of websites that offer direct sales services</td>
<td>601</td>
</tr>
<tr>
<td>Number of websites in shopping category that offer direct sales services</td>
<td>330</td>
</tr>
</tbody>
</table>
# Metric 3: Stochastic Models

<table>
<thead>
<tr>
<th>Models</th>
<th>Purchase Rate Assumption</th>
<th>Heterogeneity in purchase rate</th>
<th>Death Rate Assumption</th>
<th>Heterogeneity in death rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>NBD (Gupta and Morrison 1997)</td>
<td>Poisson</td>
<td>Gamma</td>
<td>None</td>
<td>None</td>
</tr>
<tr>
<td>Pareto/NBD (Schmittlein 1987)</td>
<td>Poisson</td>
<td>Gamma</td>
<td>Exponential</td>
<td>Gamma</td>
</tr>
<tr>
<td>BG/NBD (Fader et al 2004)</td>
<td>Poisson</td>
<td>Gamma</td>
<td>Geometric</td>
<td>Beta</td>
</tr>
<tr>
<td>Dynamic NBD (Moe and Fader 2004b)</td>
<td>Poisson with variation</td>
<td>Gamma</td>
<td>None*</td>
<td>None</td>
</tr>
<tr>
<td>Joint Model (Boatwright, et al)</td>
<td>Inter-purchase time: Poisson</td>
<td>Gamma</td>
<td>None</td>
<td>None</td>
</tr>
<tr>
<td>Dynamic Model (Allenby et al 1999)</td>
<td>Inter-purchase time: Gamma</td>
<td>Inverse Generalized Gamma</td>
<td>None***</td>
<td>None</td>
</tr>
</tbody>
</table>
Metric 3: Stochastic Models

- Enables individualized prediction
- Hard to implement
- Mostly academic research, no industry adoption yet

![Conditional Expectations Graph]

- Actual
- Estimated
Metric 4: Conversion

- **Conversion** = number of actions / number of visitors
  - Average conversion is at 5% and decreasing [Moe 2004]

<table>
<thead>
<tr>
<th>Vertical</th>
<th>Conversion Rate (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Catalog</td>
<td>6.1</td>
</tr>
<tr>
<td>Specialty stores</td>
<td>3.9</td>
</tr>
<tr>
<td>Fashion/apparel</td>
<td>2.2</td>
</tr>
<tr>
<td>Travel</td>
<td>2.1</td>
</tr>
<tr>
<td>Home and furnishing</td>
<td>2.0</td>
</tr>
<tr>
<td>Sport/outdoors</td>
<td>1.4</td>
</tr>
<tr>
<td>Electronics</td>
<td>1.1</td>
</tr>
<tr>
<td>All verticals</td>
<td>2.3</td>
</tr>
</tbody>
</table>

Source: Fireclick Index
Metric 4: Conversion

- **Conversion** = number of actions / number of visitors
  - Average conversion is at 5% and decreasing \([\text{Moe 2004}]\)

- A relatively well-accepted metric for measuring web site performance

- Depending on the goal of the web site (remember last chapter?), the meaning of “action” might differ

<table>
<thead>
<tr>
<th>September 2004</th>
<th>December 2004</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of orders</td>
<td>4,000</td>
</tr>
<tr>
<td>Divided by: Number of Web visits</td>
<td>100,000</td>
</tr>
<tr>
<td>Conversion rate</td>
<td>4%</td>
</tr>
</tbody>
</table>
Metric 4: Conversion

Revenue Generation

- Simplest to calculate
  - Use e-commerce system to find number of transactions
  - Use web analysis program to find number of visits
  - Purchase / visits
Metric 4: Conversion

Lead Generation

- For lead generation with the goal of acquire new customer information
  - Count each visitor who fills in web contact form as an action
  - That means connect the form with lead management system
  - You can also continue to track these visitors and capture their purchase events as well
Metric 4: Conversion

Lead Generation

- For lead generation with the goal of offline sales:
  - Need innovative methods for the offline channel to identify traffic re-directed from online
  - **Special** phone number, special coupon, etc
  - “Call Me” button
  - **Questionnaires** at the offline locations
Metric 4: Conversion

Lead Generation

- For lead generation with the goal of offline sales:
  - Measuring the lead is only the first step…

<table>
<thead>
<tr>
<th>December 2004 Out of 100,000 Visitors, How Many…</th>
<th>Number of Web Visitors Converted</th>
<th>Web Conversion Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Called a special phone number?</td>
<td>10,000</td>
<td>10%</td>
</tr>
<tr>
<td>Brought discount coupon to a dealer?</td>
<td>3,000</td>
<td>3%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>December 2004 Average Order: $2,000</th>
<th>Web Conversions</th>
<th>Sales Conversion Rate</th>
<th>Offline Orders</th>
<th>Sales Revenue</th>
</tr>
</thead>
<tbody>
<tr>
<td>Special phone number</td>
<td>10,000</td>
<td>1%</td>
<td>100</td>
<td>$200,000</td>
</tr>
<tr>
<td>Discount coupon</td>
<td>3,000</td>
<td>10%</td>
<td>300</td>
<td>$600,000</td>
</tr>
<tr>
<td>Online quote</td>
<td>1,000</td>
<td>10%</td>
<td>100</td>
<td>$200,000</td>
</tr>
<tr>
<td>Totals</td>
<td>14,000</td>
<td>3.6%</td>
<td>500</td>
<td>$1,000,000</td>
</tr>
</tbody>
</table>
Metric 4: Conversion
Brand Image

- Abstract and hard to measure
  - First, define what is a conversion based on the goal of your campaign
  - Then implement possible mechanism to capture conversion behaviour
**Metric 5: Monetary Measurements**

- **Cost per Action:** the advertising cost you pay for one completed action
  - Advertising Cost / Total Completed Actions
  - For example, 1,000 visitors, $1 per visitor, 20 end up purchasing, then cost per purchase = ?

- **Value of a Buyer:** the average gross profit you earn from a completed action
  - Average Action Value x Gross Profit as % of Sales
  - Average Action Value = revenue / action
  - For example, last month you spent $1,000 on advertising to generate 2,000 visitors and 20 bought at an average of $100 per sale with a gross profit margin of 90.
Web Analysis Tools

- Tools that help analyzing the web site performance
  - Basic Level:
    - number of visitors to the site,
    - unique/return visitors
    - traffic referrers
    - search engine referrers
    - search keywords used
    - page views
    - visit paths
    - average number of page views per visitor
    - entry and exit pages
Web Analysis Tools

- Tools that help analyzing the web site performance
  - Advanced Level:
    - Conversion stats.
    - Dividing the website into logical categories and monitoring each separately
    - Bounce rates- the percentage of visitors who leave the website within the first x seconds of the visit.

- Example