Predictive Analytics to Influence & Persuade Staff & Students

ISCN Symposium
June 20, 2012

Eric Siegel, Ph.D.
Conference Chair
Predictive Analytics World
Eric Siegel, Ph.D.

Predictive Analytics World

www.pawcon.com

June 25 – 26, 2012
Chicago

Boston

Also: Dusseldorf, London
San Francisco, Toronto, DC

Program Chair:
Predictive Analytics World
Text Analytics World

President: Prediction Impact, Inc.

Instructor: predictive analytics training

Former computer science professor:
Columbia University

Cofounded software companies:
User profiling and data mining
Predict.
Agenda

- What every organization can learn from insurance companies
- Predicting behavior
- Case Studies
- Uplift modeling
Risk
“Insurance is nothing but management of information. It is pooling of risk, and whomever can manipulate information the best has a significant competitive advantage.”

Eric Webster
VP Marketing, State Farm

Insured “office workers”
This simple definition regards predictive analytics’ output and its value proposition, rather than the technology behind it, i.e., how the predictive scores are generated. But that technology – learning from data – is really the defining characteristic of predictive analytics.
Today  →  Tomorrow  

1%

Today  →  Tomorrow  

3%

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Predictive Analytics World
Yesterday is history, tomorrow is a mystery, but today is a gift. That is why it is called the “present.”
Yesterday

male, CA, 10 purchases...

Today

response: YES
http://www.nytimes.com/2009/05/17/magazine/17credit-t.html
Online conversion to paying membership, by email domain. Customers who sign up with "Hotmail" and "Yahoo" email accounts are far less likely (20 - 25% as likely) to convert to a paid subscription than users with email addresses that may be more "permanent," such as ".net" or "EarthLink" email addresses. This insight speaks directly to business strategy, such as employing incentives for customers to provide permanent email addresses, or partnering with certain email service providers.
From Dr. Usama Fayyad's Predictive Analytics World Keynote, 2009/2010, on his prior work at Yahoo!
Smoking and carpal tunnel:
http://www.statefundca.com/safety/ErgoMatters/Microbreaks.asp

"Quitting smoking is contagious" - "When one person (we'll call him the index case) quits smoking, his closest contacts, such as friends and family members, become 36% less likely to be smokers too."
http://www.time.com/time/health/article/0,8599,1808446,00.html
Aspects of the public's mood, such as a state of "calm" as detected on Twitter feeds, has been shown to contain predictive information with regards to the Dow Jones Industrial Average.


Also see:
http://www.ccs.neu.edu/home/amislove/twittermood/
Prediction

Prediction is very difficult, especially if it's about the future.
- Niels Bohr

How come you never see a headline like “Psychic Wins Lottery”?  
- Jay Leno
A crummy predictive model delivers big value. It’s like a skunk with bling.
PREMIER Bankcard also lowered delinquency to increase net by over $10 million.

Reed Elsevier's Caterer & Hotelkeeper
HIGH TECH
Google *improves ad quality*
Sun *doubled conversions*

NON-PROFIT
The Nature Conservancy
*Discovered how to earn $650,000 in donations*

SMALL BUSINESS
Harbor Sweets
*Earn a 40% response rate amongst lapsed buyers*

ENTERTAINMENT
Netflix
*$1 million contest improved recommendations by 10%*

GOVERNMENT
U.S. SSA
*Sped up many disability claims by hundreds*

RETAIL
Overstock.com
*$1 million contest to improve recommendations*
outreach’s influence on
Predict consumer behavior.
Does contacting the consumer make them more likely to respond?

**MEDICAL:**

Will the patient survive if treated?

"My headache went away!" Proof of causality by example.

Driving medical decisions with personalized medicine: selecting treatment, e.g., treating heart failure with betablockers

Personalized medicine. Naturally, healthcare is where the term treatment originates. While one medical treatment may deliver better results on average than another, personalized medicine aims to decide which treatment is best suited for each patient, since a treatment that helps one patient could hurt another. For example, to drive beta-blocker treatment decisions for heart failure, researchers "use two independent data sets to construct a systematic, subject-specific treatment selection procedure." (Claggett et al 2011) Certain HIV treatment is shown more effective for younger children. (McKinney et al 1998) Cancer treatments are targeted by the patient's genes. (Winslow 2011)

Predict:

Respondents
“Sure things”
“Do-not-disturbs”

“Uplift modeling empowers your organization to capture more than 100% of responses by contacting less than 100% of the target population.”

Kathleen Kane
Principle Decision Scientist
Fidelity Investments

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Response Uplift Modeling

<table>
<thead>
<tr>
<th>Buy if do</th>
<th>Do-Not-Disturbs</th>
<th>Lost Causes</th>
</tr>
</thead>
<tbody>
<tr>
<td>No</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td><strong>Sure Things</strong></td>
<td></td>
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<tr>
<td>Yes</td>
<td></td>
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<tr>
<td>No</td>
<td></td>
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</tbody>
</table>

Buy if don’t receive an offer

COST CUTTER: Don’t contact those who’d respond anyway.
Source of second example: Kim Larsen, Uplift Workshop at Predictive Analytics World

US BANK EXAMPLE

… to existing customers

Resulting improvements over prior conventional analytical approach:
Campaign ROI increased over 5 times previous campaigns (75% to 400%)
  Cut campaign costs by 40%
  Increase incremental cross-sell revenue by over 300%
  Decrease mailings to customers who would purchase whether contacted or not, and customers who would purchase only if not contacted.

Sources: Radcliffe & Surry (2011), Tsai (2010), Patrick Surry (Pitney Bowes Business Insight), Michael Grundhoefer (US Bank)
(This paper in turn references all the core technical papers on this topic.)

Free white paper: www.predictiveanalyticsworld.com/signup-uplift-whitepaper.php
Conclusions

1. Data is predictive
2. Predicting behavior optimizes ... even with lousy predictions
3. Risk aversion – like insurance companies
4. Predicting influence optimizes even better
PREDICTION IMPACT
Predictive Analytics for Business and Marketing

Training program:
Predictive Analytics for Business, Marketing and Web
New York City - March 22-23 2012
São Paulo - July 26-27 2012
San Francisco - October 11-12 2012

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