



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.

 **PREDICTIONIMPACT**
Predictive Analytics for Business and Marketing



www.pawcon.com

June 25 – 26, 2012
Chicago

Sept. 30 – Oct. 4, 2012
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.



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Agenda

- What every organization can learn from insurance companies
- Predicting behavior
- Case Studies
- Uplift modeling



Before:



After:



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

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"Discussion with State Farm's Eric Webster: Insurance and Data Mining," Gregory Piatetsky, Ph.D., KD Nuggets. <http://www.kdnuggets.com/news/2009/n08/3i.html>



Insured “office workers”

Predictive Analytics:

Data driven technology that produces a predictive score for each individual.

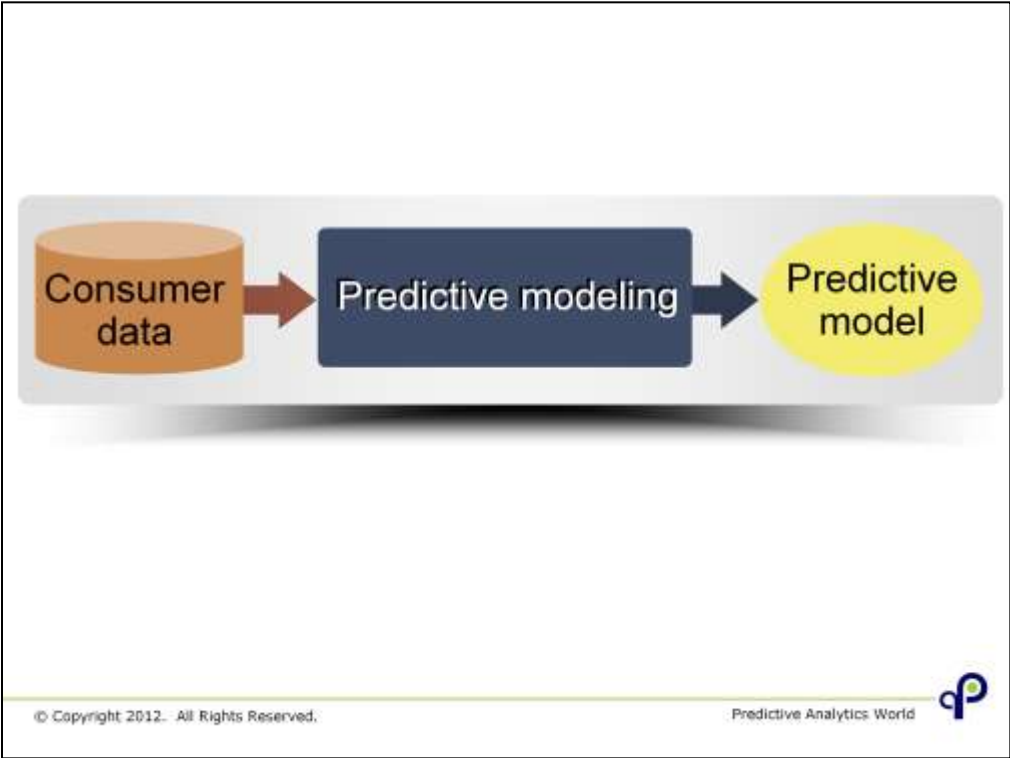


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This simple definition regards predictive analytics' output and its value proposition, rather than the technology behind it, i.e., how the predictive scores are generated. But that technology – learning from data – is really the defining characteristic of predictive analytics.





Today



Tomorrow





Today



Tomorrow

1%



Today



Tomorrow

3%



Yesterday is history, tomorrow is a mystery, but today is a gift. That is why it is called the "present."





Yesterday



Today

male, CA, 10 purchases... response: YES

Credit card used at drinking place

→ **More likely to miss payments repeatedly**



Credit card used at the dentist

→ **Less likely to miss payments repeatedly**

Buy cheap, generic automotive oil vs. name-brand

→ **More likely to miss a payment**



Buy chair leg felt pads

→ **Rarely miss a payment**

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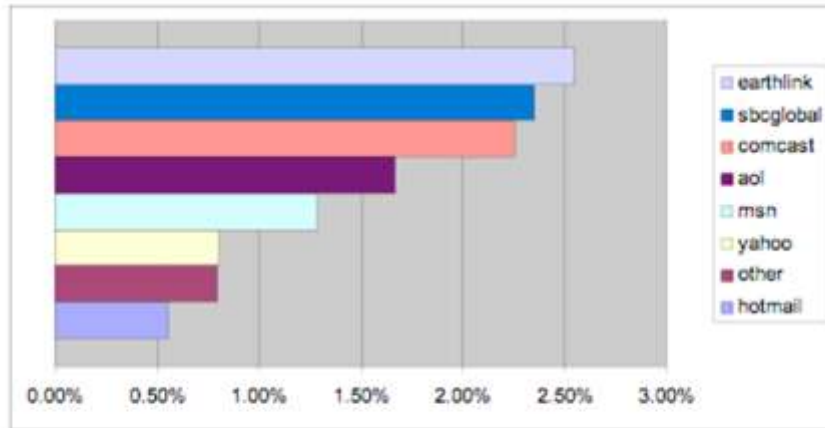
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Examples from, "What Does Your Credit-Card Company Know About You?" New York Times, May 12, 2009.

<http://www.nytimes.com/2009/05/17/magazine/17credit-t.html>

Acquisition Rate by Email Address



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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.

Independence

▶ And \$100 credit

HARRISdirect.

Invest with Harris *direct* ▶

If banner is seen:

- Related searches **+61%**
- Paid clicks **+249%**

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From Dr. Usama Fayyad's Predictive Analytics World Keynote, 2009/2010, on his prior work at Yahoo!



Smoke

→ **Less likely to get carpal tunnel**

Call center moved to lower floor

→ **Smoker productivity improved**

Quit smoking

→ **Friends/family 36% less likely smokers**

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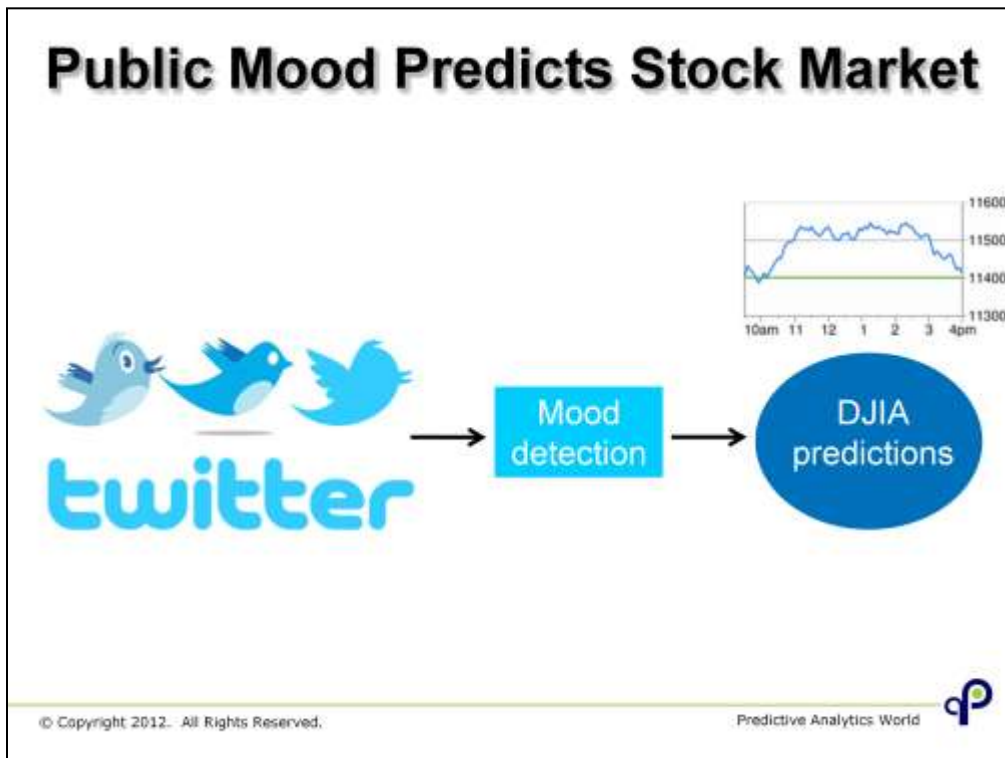


Smoking and carpal tunnel:

<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.

Twitter mood predicts the stock market. See <http://arxiv.org/abs/1010.3003>. Johan Bollen, Huina Mao, Xiao-Jun Zeng at the School of Informatics and Computing, Indiana University and School of Computer Science, The University of Manchester.

Also see:

<http://www.ccs.neu.edu/home/amislove/twittermood/>

Prediction

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

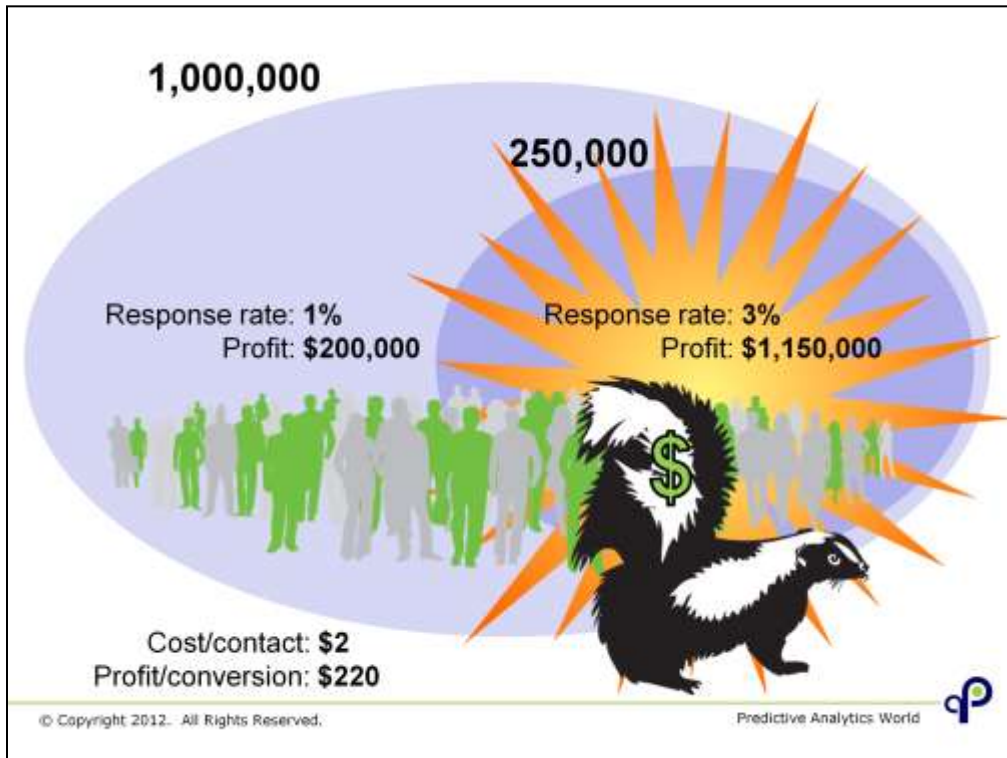
- Niels Bohr



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.

TELECOM Optus <i>Identified customers 10 times more likely to cancel</i>	HEALTHCARE Life Line Screening <i>Refined their outreach to increase response by 38%</i>
RETAIL Target <i>Improved direct mail targeting by 15-20%</i>	PUBLISHING Caterer & Hotelkeeper <i>Gained 16% points in its renewal rate</i>
FINANCIAL SERVICES PREMIER Bankcard <i>Reduced mailing costs by \$12 million</i>	CONSUMER SERVICES CAA <i>Reduced required dispatches by 25%</i>

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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*

SMALL BUSINESS

Harbor Sweets

*Earn a 40% response rate
amongst lapsed buyers*

GOVERNMENT

U.S. SSA

*Sped up many disability
claims by hundreds*

NON-PROFIT

The Nature Conservancy

*Discovered how to earn
\$650,000 in donations*

ENTERTAINMENT

Netflix

*\$1 million contest improved
recommendations by 10%*

RETAIL

Overstock.com

*\$1 million contest to improve
recommendations*



outreach's influence on
Predict  consumer behavior.



only
Will the consumer respond if contacted?
^

only
Will the patient become healthy if treated?
^

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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)

Brian Claggett, Lihui Zhao, Lu Tian, Davide Castagno, and L. J. Wei. "Estimating Subject-Specific Treatment Differences for Risk-Benefit Assessment with Competing Risk Event-Time Data " Harvard University Biostatistics Working Paper

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

Buy if do receive an offer	No	Do-Not-Disturbs	Lost Causes
	Yes	Sure Things	Persuadables
		Yes	No

Buy if **don't**
receive an offer



COST CUTTER:
Don't contact those
who'd respond anyway.



US Bank

Business case: Direct mail for a home-equity line of credit

Approach: Target campaign with an uplift model

Resulting improvements over prior approach:

- Campaign ROI increased over 5 times
- Costs down 40%
- Lift increased by a factor of 2

Leading financial institution

Business case: Direct mail for a financial product

Approach: Target campaign with an uplift model

Resulting improvements over prior approach:

- Increased revenue per contact by a factor of 20

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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)

Download the free white paper:

"Uplift Modeling: Predictive Analytics Can't Optimize Marketing Decisions Without It"

by Eric Siegel, Ph.D.

www.pawcon.com/signup-uplift-whitepaper.php



(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





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Bigger wins!
Strengthen the business impact
delivered by predictive analytics.

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"Predictive Analytics World was probably the best analytics conference I have attended... turned into my new must-go-to conference."

Dennis Mortensen
Director of Data Insights
Yahoo!

PAW March 2012 drew 500 attendees. PAW has included case studies from: AT&T, Aflac, Amazon.com, Amway, Anheiser-Busch, BBC, Barclays, Blue Cross, BoA, Citibank, Fidelity, GE Capital, Google, HP, HSBC, Infinity, Intuit, LinkedIn, Macy's, Match.com, MetLife, Microsoft, NRA, Netflix, Orbitz, Overstock.com, PayPal, Reed Elsevier, Target, The Economist, US Bank, US Bank, Wells Fargo, YMCA, Yahoo! and many more.

98% of attendees rated
the instructor
Excellent or Very Good

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



businessprediction.com

To Learn More: Predictive Analytics Guide

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