Predictive Data Analytics Driving Retention and Revenue

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The Bottom Line

- Our predictive data analytics driven retention strategies have reduced churn by…
  - 35% at 12 months post launch
  - 24% full year 2016 vs. 2015
- These results are on top of the following in the previous 5 years…
  - Daily Individually Paid Audited Circulation – within the top 5 least decline among top 25 to 50 US pubs.
  - Average Revenue per Subscriber – Doubled
- We'll share 4 basic predictive data analytics application case studies driving retention and revenue

Audience Data is helping us better understand; at the **individual customer level**…

- Engagement habits and dynamics
- Relationship quality
- Cancelation probability
- Retention treatment influence
- Conversion propensity
- Monetization opportunities

Predictive Analytics is guiding us

What is Predictive Analytics?

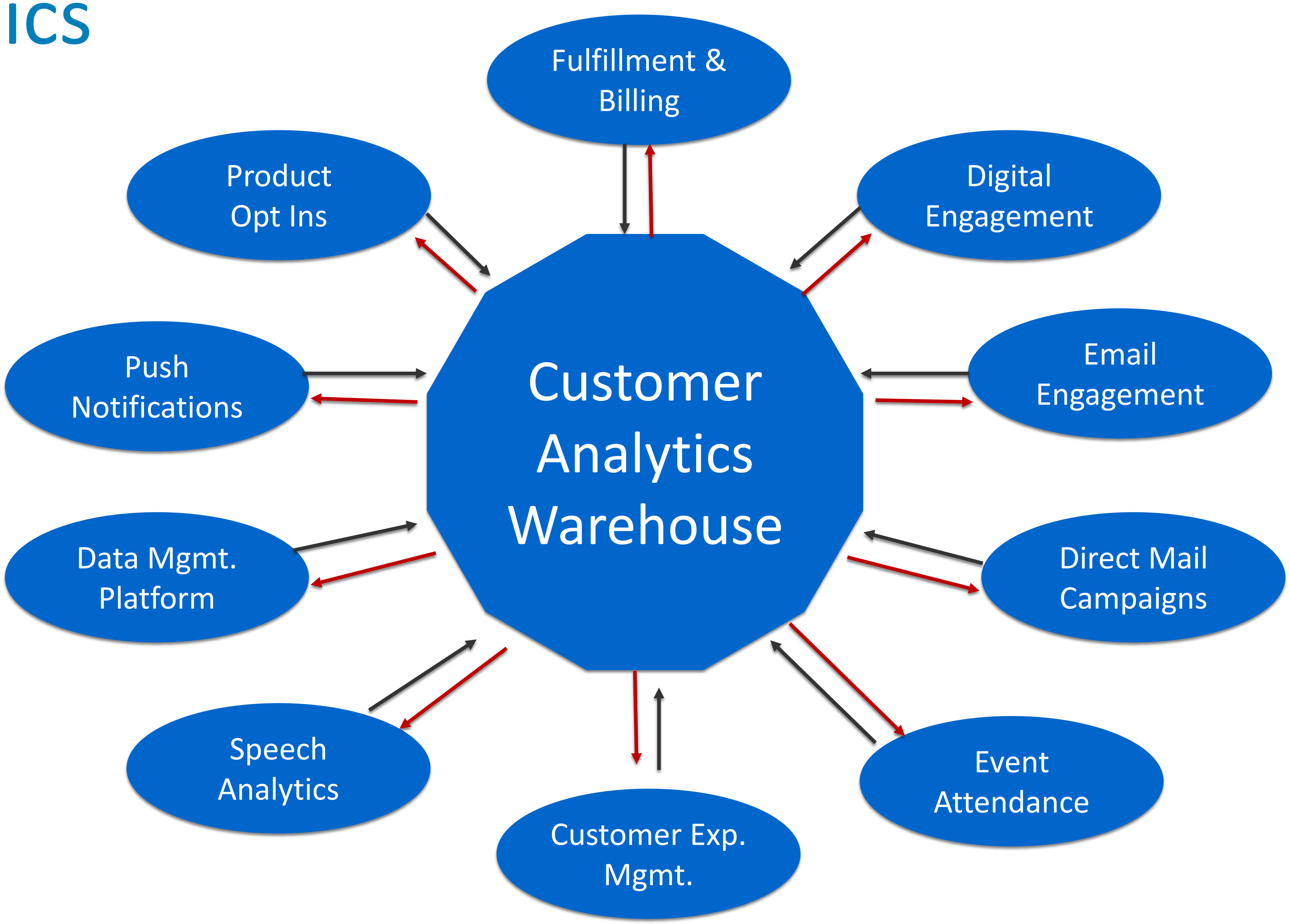
- **Data Science** – mining, statistics, modeling, machine learning
- **Exploits Patterns** – Capturing Relationships
- **Predicted Score** – (probability) for each individual
- **Actions and options** – to benefit from the predictions

Modeling

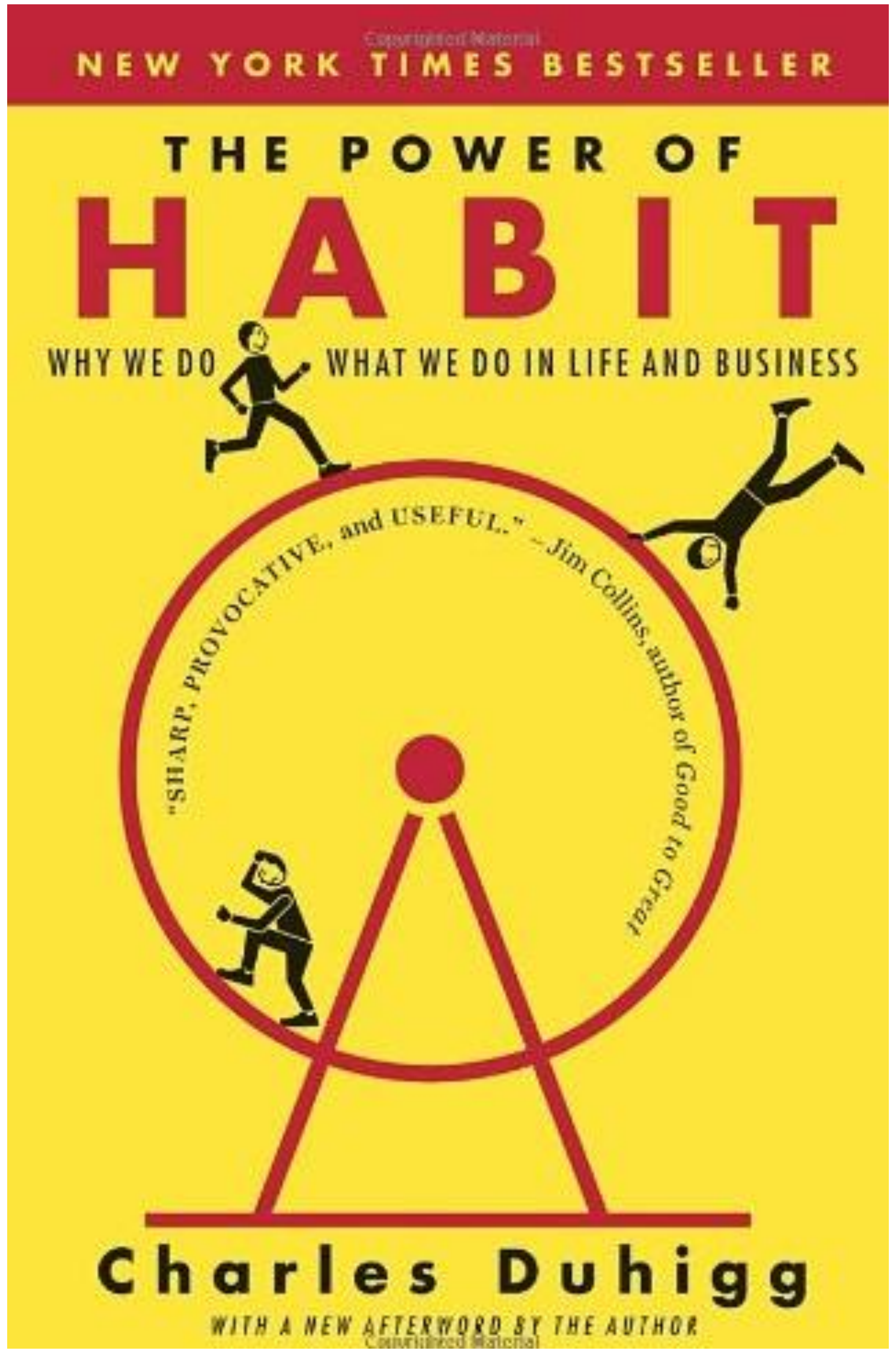
- **Propensity** – likelihood of conversion
- **Churn** – probability of canceling, declining engagement
- **Persuasion** – influence and lift (sure, self-selectors, swing)

Matching and Integrating Customer Records Enables Predictive Analytics

Golden Customer Record



Understanding the Science of Habits Compliments the Leveraging of Predictive Analytics



- Dictionary.com – an acquired behavior pattern regularly followed until it has become almost involuntary
- Charles provides a framework for understanding how habits work and a guide to experimenting with how they might change
  - Craving: 4 days/100 hours to break
- Retention Marketing – **start with identifying each individual subscriber's routine of engagement (habits) with your touchpoints and experiment with stimulus when you detect a change in routine**

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Audience Data Paradigm Shift

- **Predictive Analytics over "Gut Instinct"** – however, it's a careful balance between art and science that exploits data analytics and that will drive us forward
- **What is the Impact on Audience Satisfaction, Retention, and Price Elasticity** – needs to be top of mind in strategic decision making across the organization
- **Brand Engagement over Platform Consumption** – it's all customer touchpoints
- **Customer over Product Perspective & Individualized over One Size Fits All** – marketing and content delivery focused on the individual customer

Four Basic Predictive Analytics Application Case Studies with significant Retention & Revenue Impact

1 – Dynamic Messaging for Engagement Deviations

2 – Surprise and Delight Retention Marketing

3 – Optimizing Surprise and Delight Retention Marketing

4 – Determining Niche Product Opt Ins

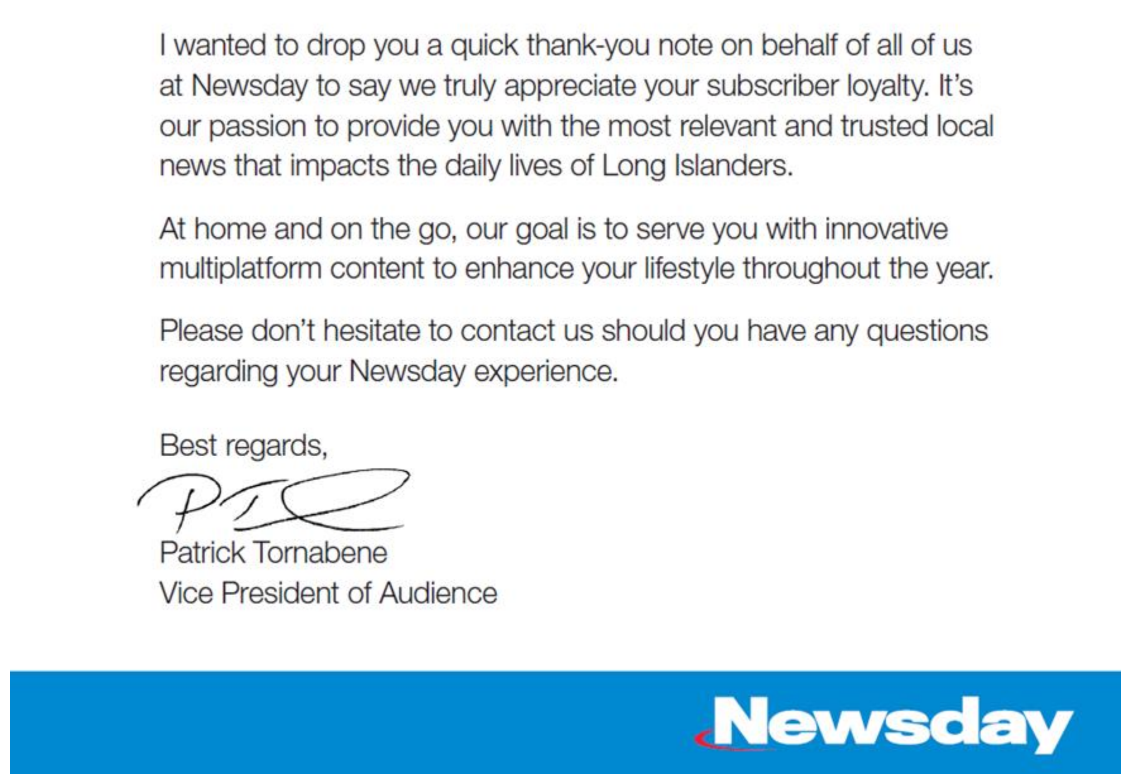
Application Case Study 1 – **Dynamic Messaging for Engagement Deviations – Payments**

- Communications triggered by subscribers deviations from prior payment behaviors instead of a generic communications sequence applied to all subscribers
- 13% reduction in formers at 4 months post application for those that deviated

Application Case Study 2 – **Surprise & Delight Retention Marketing**

- Gift or expression of gratitude sent to subscribers with high or accelerating probability of churn

- Reduction in formers –
  - Gift for high churn probability subscribers: 40% at 5 months; 20% at 9 months
  - Gratitude for accelerating churn probability subscribers: 30% at 5 months; 15% at 9 months



I wanted to drop you a quick thank-you note on behalf of all of us at Newsday to say we truly appreciate your subscriber loyalty. It's our passion to provide you with the most relevant and trusted local news that impacts the daily lives of Long Islanders.

At home and on the go, our goal is to serve you with innovative multiplatform content to enhance your lifestyle throughout the year.

Please don't hesitate to contact us should you have any questions regarding your Newsday experience.

Best regards,

Patrick Tornabene
Vice President of Audience

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Optimizing Retention Marketing – Net Lift/Persuasion Modeling

- Identifies "swing/persuadable subscribers." Three groups…
  - **Sure** – Will behave like you want them to, even if you don't target them. They are already persuaded.
  - **Self Selectors** – Likely to do decision on their own. Retention efforts could even have an adverse effect.
  - **Swing/Persuadable** – Will have a positive response to retention marketing. Need some convincing and open to being convinced.
- Methodology: Random Forest Learning (Machine Learning Algorithm)
- Additional $80k in retention spend saves 3700 more subscribers

Net Lift/Persuasion Modeling Insights

Typical Subscriber – Greeting Card Treatment

Account_num	23358916	43316337
Net Lift	7%	-5%
pf	0.73	0.04
income	Lowermid	Midscale
age	Younger	Older
period	8	8
tenure	0-1 years	0-1 years
source	DIRR	VOLN
EZpay	0	1
num_comps	0	9
Payment_days	-4	-11.8
Tenure days	177	16
freq	Thursday & Sunday	Thursday & Sunday
Weekly pay	2	2.5
Billing	NON	NON
pf_change	-0.005	-0.024

Subscriber on the right is a typical self-selector

- Started subscribership voluntarily
- 9 complaints in 16 days
- EZpay

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Net Lift/Persuasion Modeling Insights

Typical Subscriber – Charger Treatment

Account_num	71710988	20296878
Net Lift	7%	-4%
pf	0.72	0.22
income	Lowermid	Midscale
age	Younger	Mature
period	8	8
tenure	0-1 years	5 + years
source	BILL	VOLN
EZpay	0	0
num_comps	0	0
Payment_days	57.33	-10.42
tendays	249	9581
freq	Other	Daily
Weekly pay	2	10.09
Billing	2nd renew	NON
pf_change	-0.005	0.0006

Subscriber on the left needs stimulus

- Pays bill 57 days post expire on average
- Just received 2nd (reminder) bill
- Very likely to churn (high pf)

Subscriber on the right doesn't want a charger

- Midscale and mature, might already have chargers
- Already well-engaged

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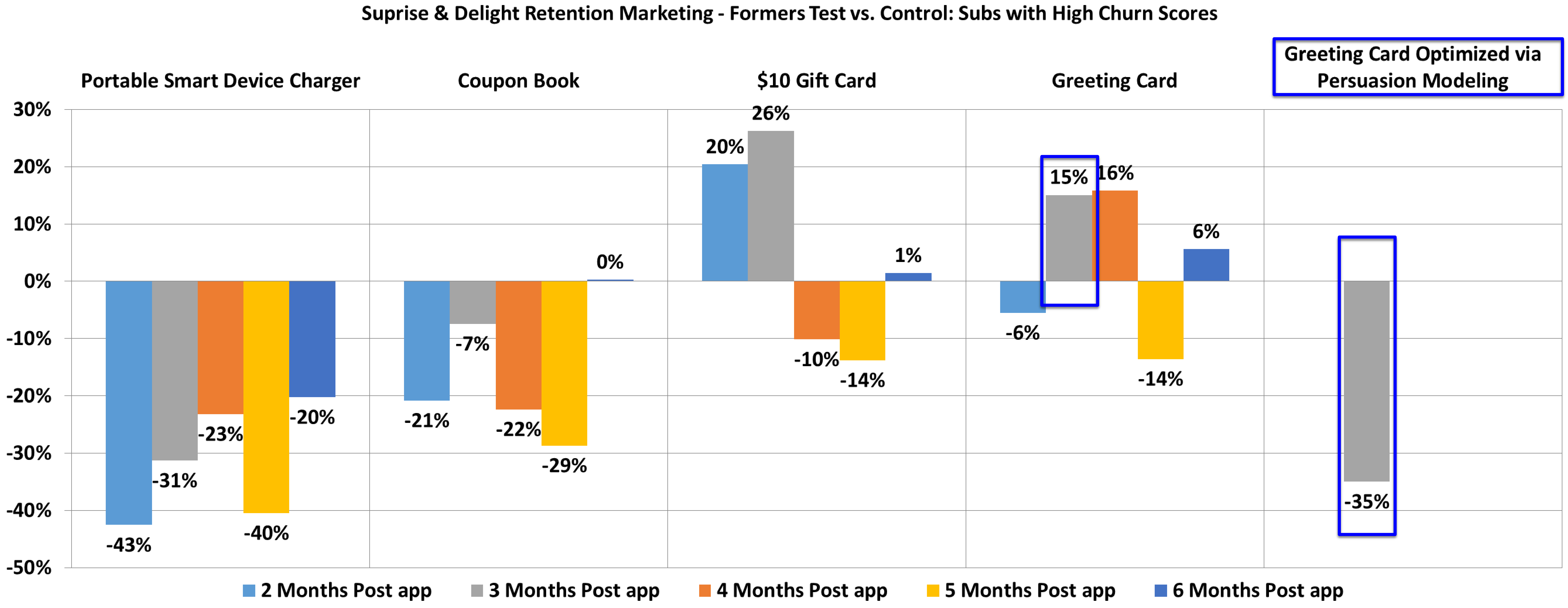
Application Case Study 3 – **Net Lift/Persuasion Modeling Optimizing Surprise and Delight**

Target **all swing clients** with Net Lift Score >2%, with most suitable treatment optimizing cost per save

	Base case (based on churn level)					**Net Lift/Persuasion Model**						
	Accelerating	**High**	**Low**	**Sum**		**Group 1**	**Group 2**	**Group 3**	**Group 4**	**Sum**		**Variance**
Treatment	Greeting	Charger	Greeting			Greeting	Charger	Coupon Book	Gift Card			
Population	4,395	11,165	44,907	60,467		113,091	9,579	4,702	3,835	131,207		
% Formers 90 Days Post App												
Treatment	6.8%	4.8%	3.6%			2.8%	2.9%	4.0%	3.1%			
Control	9.7%	6.9%	4.1%			6.1%	6.0%	7.6%	6.3%			
Net Lift ppt	2.9%	2.1%	0.5%			3.3%	3.1%	3.6%	3.2%			
Net Lift %	42.6%	43.8%	13.9%			117.9%	106.9%	90.0%	103.2%			
Expense												
Unit	$0.55	$16	$0.55			$0.55	$16	$7	$8.50			
Total	$2,417	$178,640	$24,699	**$205,756**		$62,200	$153,264	$32,914	$32,598	**$280,976**		**$75,219**
Subs Saved	127	234	235	**596**		3743	296	172	123	**4334**		**3738**
Per Save	$19	$763	$105	**$345**		$17	$518	$191	$265	**$65**		**($280)**

Results: Our net lift model defined that an additional $75k saves 3700 more subscribers

Application Case Study 3 – **Net Lift/Persuasion Modeling Results**



<u>Results</u>: Reduction in formers via gratitude to high churn subs is 35% at 3 months vs. -15% prior to persuasion model

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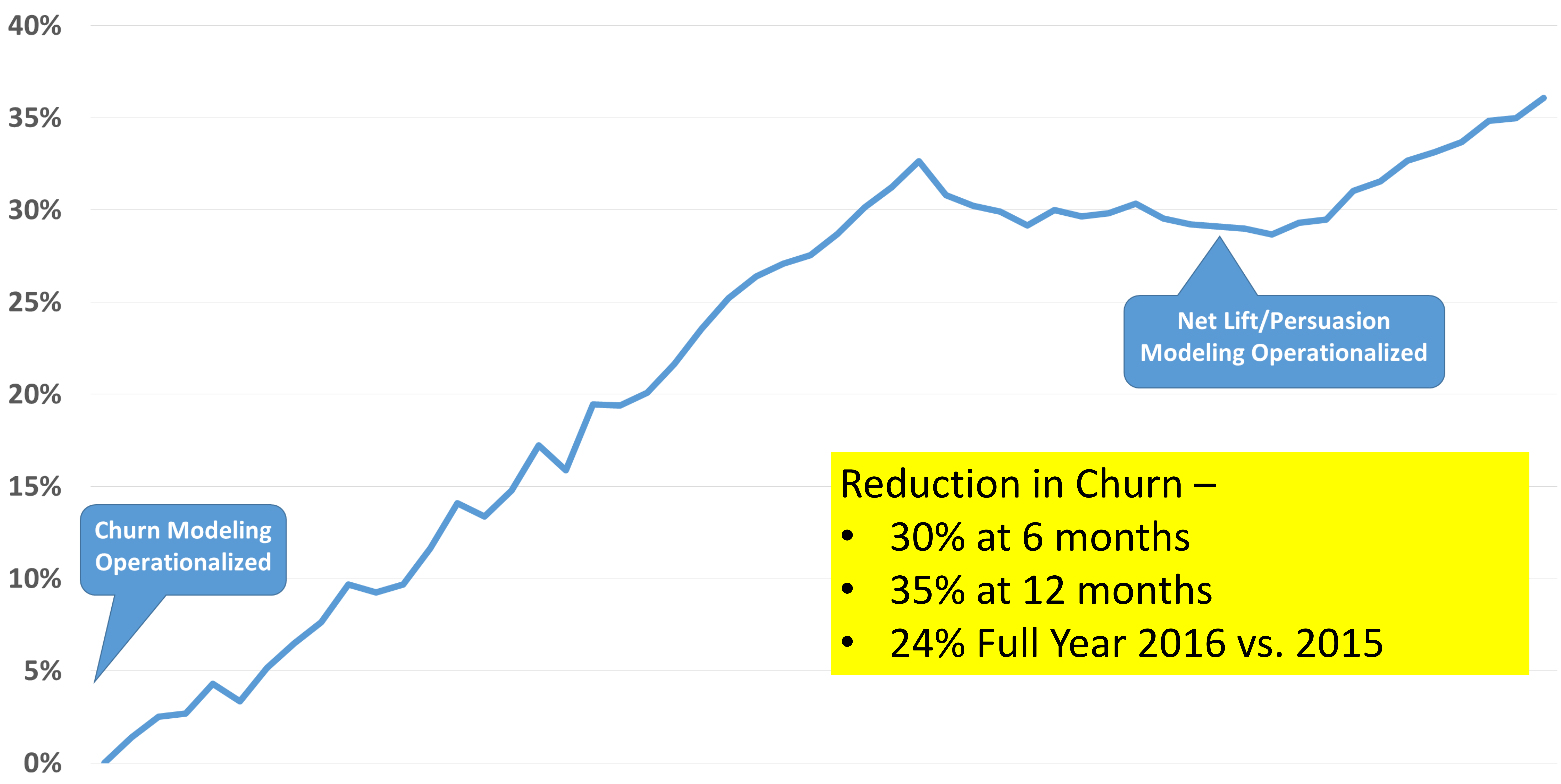
Application Case Study 4 –
Determining Niche Product Opt Ins

- Providing additional products/content, as identified by consumer feedback coupled with churn modeling, on a no charge opt in basics
- Brain Benders Monthly
  - 12% reduction in churn probability upon opting in
  - 5% more price increase with nearly no stops
  - 50% reduction in churn at 4 months post opt in

What’s the Total Impact on Churn?

Impact on Churn – Trailing 12 Months Year/Year



Reduction in Churn –
- 30% at 6 months
- 35% at 12 months
- 24% Full Year 2016 vs. 2015