

# Marketing Resource Allocation

## Introduction

- **Welcome to the exciting field of Marketing Analytics!**
- **Marketing analytics helps marketing managers make decisions.**
- **In this module, we will**
  - Discuss why marketing analytics is important
  - Review the resource allocation process
- **By the end of this module, you will be able to use basic tools to determine effective resource allocation.**

## **Buzz About Big Data and Analytics**

- **From 2013-2020, the digital universe will grow by a factor of 10- from 4.4 trillion gigabytes to 44 trillion. It more than doubles every two years.**

- The digital universe of opportunities, IDC report, April 2014

## **Buzz About Big Data and Analytics**

- **Companies in the top 3<sup>rd</sup> of their industry in the use of data driven decision making are on average**

- **5% more productive**
- **6% more profitable**

**than their competitors.**

- The Big Data Management Revolution, Harvard Business Review, 2012

## Buzz About Big Data and Analytics

*“McKinsey & Co. analysts...showed a typical range of 15% to 20% of marketing budgets could be reinvested in other activities or returned to the bottom line without losing marketing ROI ... **\$200 billion** of marketing spent annually could be put to better use.”*

Source: “Smart Analytics can tap up to 20% of lost ROI,” The Economist Group, Nov 2013

## Buzz About Data and Analytics

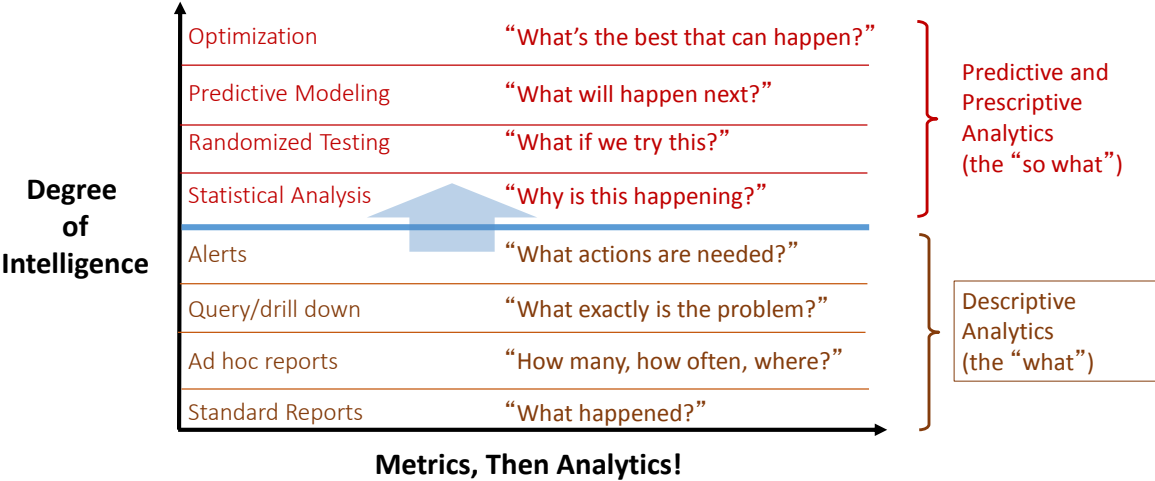
High Performers		Low Performers
65%	have significant decision-support/analytical capabilities	23%
36%	value analytical insights to a very large extent	8%
77%	have above average analytical capability within industry	33%
73%	make decisions based on data and analysis	51%
40%	use analytics across their entire organization	23%

Source: Thomas Davenport, Competing on Analytics, 2007

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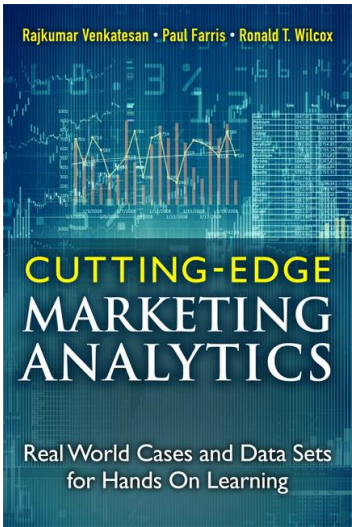
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## Marketing Analytics?



Source: Thomas Davenport, Competing on Analytics, 2007

## Resources on Marketing Analytics

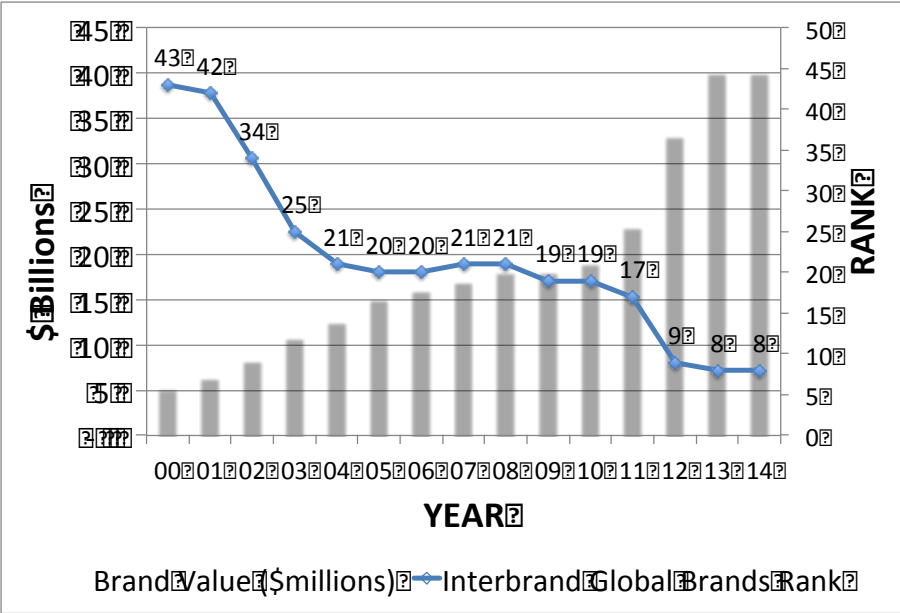


Resource Videos and Datasets at  
<http://dmanalytics.org>

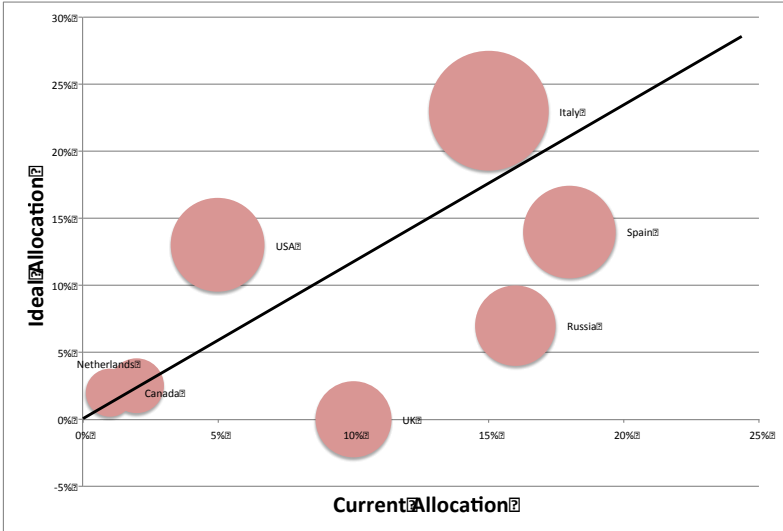
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## The Samsung Brand Value Growth



## Optimal Marketing: Misallocations Revealed



Source: Adapted from, Samsung Electronics Co., Harvard Business Publishing Case, John Quelch, Anna Harrington, Jan 2008.

### Resource Allocation Process

- **Determine the performance metric?**
  - Market share, profits, customer lifetime value, etc.
- **Map a system of metrics framework connecting marketing inputs to the performance metric**
- **Build a econometric (regression) model for the unknown values in the system of metrics framework**
  - The regression model will be a function of marketing inputs of interest, e.g., price, advertising, sales calls, etc.

### Resource Allocation Process

- **Once the regression model is obtained, predict the performance metric using the regression function**
- **Identify the optimal value of the marketing input that maximizes the performance metric**
  - Hint: Solver
  - Hint: Regression function connects marketing inputs to the components of the performance metric

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## System of Metrics for Net Profit

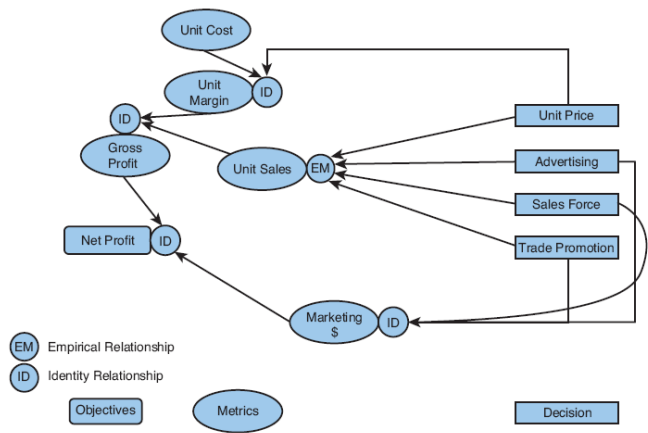


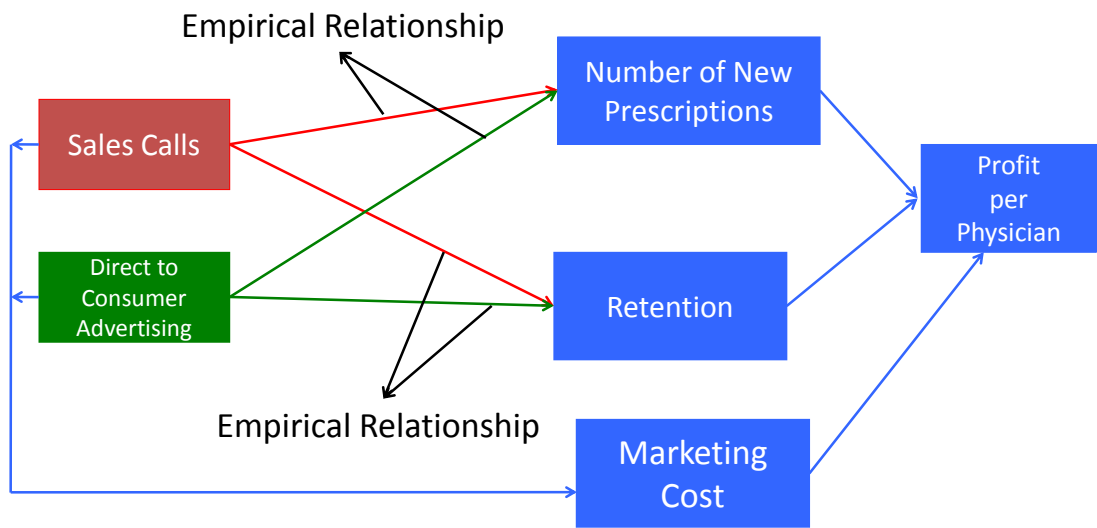
Figure 12.4 Empirical Relationship with Components of Marketing Outcomes

## What Is an Empirical Relationship?

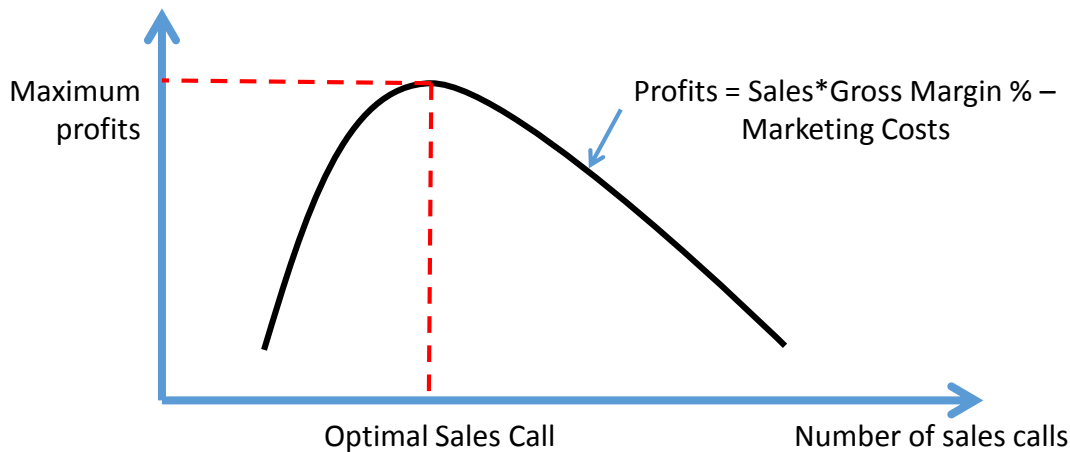
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## Resource Allocation Process – Pfizer



## Maximizing Profits and Optimizing Marketing – Pfizer





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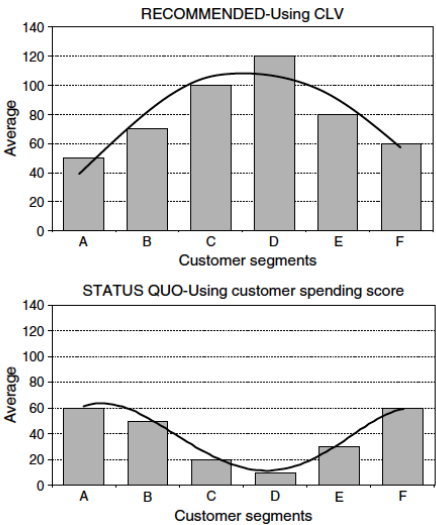
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## Maximizing Sales and Optimizing Sales Calls – Pfizer

Estimated Weights				Price	Cost of Sales Calls
Number of prescriptions		Retention			
Intercept	Sales Calls	Intercept	Sales Calls		
0.05	1.5	0.006	1.2	300	50

Sales Calls	Sales	Retention	Profit	
1	1.09	0.70	109.73	
2	1.70	0.79	181.65	Current
3	2.13	0.84	226.31	
4	2.46	0.87	252.30	
5	2.74	0.90	265.25	
6	2.97	0.91	268.74	Optimal
7	3.17	0.92	265.10	
8	3.35	0.93	255.94	
9	3.50	0.94	242.39	
10	3.65	0.95	225.27	

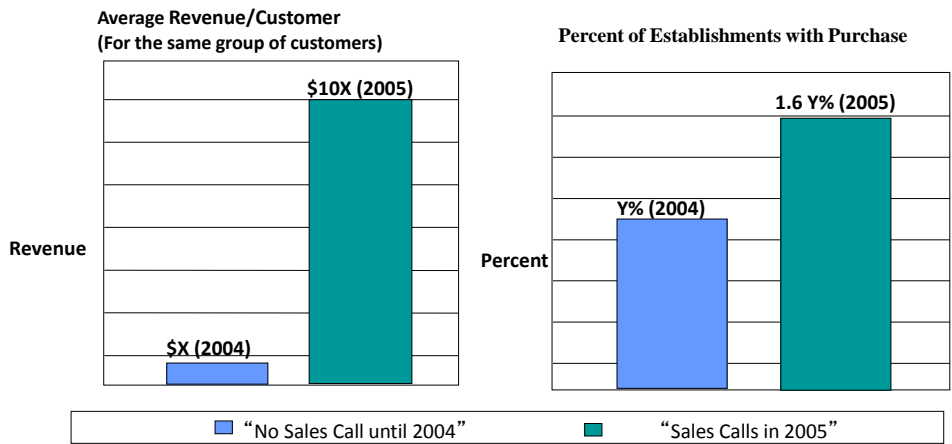
## Optimizing Sales Force at IBM



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## Outcomes of Optimizing Sales Force at IBM



Incremental revenue attributed to net new accounts targeted by sales force using customer profit model recommendations = **\$ 19.2 million.**

*“Half the money I spend on advertising is wasted; the trouble is I don’t know which half”*

**John Wanamaker**

Father of Modern Advertising

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## ROI

$$\text{Financial ROI} = \frac{\text{Profit}}{\text{Value of Investment}}$$

$$\text{Return on Marketing Investment (MROI)} = \frac{\text{Incremental Gross Margin f/Mktg} - \text{Marketing Investment}}{\text{Marketing Investment}}$$

## Marketing ROI (or ROMI)

- The arithmetic is easy
- The estimation and definition of effects are not
- The same term (“ROI”) can be used to describe a multitude of methods

### Common Scenarios for ROI

- **Nine West shoes customized product listing ads on Google to individual products and devices (especially mobile) with the help of RKG group**
- **Nine West Product listing ads registered ten times higher conversion rates than non branded keywords on Google AdWords**

Source: Google Shopping case study, RKG Group



### Common Scenarios for ROI Calculations

- **A Chief Marketing Officer (CMO) wishes to convince the Chief Financial Officer (CFO) that long-term returns to customer acquisition spending will be justified.**
  - **Customer Lifetime Value-based ROI will be useful, but may not tell the full story of marketing productivity and costs**

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## Return on Investment (ROI)

Powerful Power Tools spends \$2 million for Search Engine Marketing in 2012, generates \$10 million in incremental sales in 2012 with contribution margins of 50%.

$$\begin{aligned}\text{ROI} &= (\$10\text{M} * 50\% - \$2\text{M}) / \$2\text{M} \\ &= (\$5\text{M} - \$2\text{M}) / \$2\text{M} \\ &= \$3\text{M} / \$2\text{M} \\ &= \underline{\underline{150\%}}\end{aligned}$$



As a marketing manager (or CFO), what questions might you ask?

## What Questions Do You Ask?

Powerful Power Tools spends \$2 million for Search Engine Marketing in 2012, generates \$10 million in incremental sales in 2012 with contribution margins of 50%. ROI = 150%

- **Will the investment in 2012 pay dividends in 2013 also?**
  - What is the carryover of marketing investments? Should some new customer acquisitions in 2013 be attributed to the investment in 2012?
- **How was incremental gross margin determined? What is the baseline without the search engine marketing?**

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## What Questions Do You Ask?

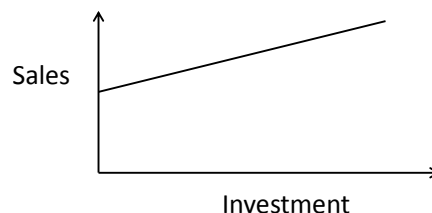
Powerful Power Tools spends \$2 million for Search Engine Marketing in 2012, generates \$10 million in incremental sales in 2012 with contribution margins of 50%. ROI = 150%

- Will doubling the investment to \$4 million double the returns to \$20 million in incremental sales?
  - Are there diminishing returns to marketing?
- What are the longer term effects?
  - How many new customers did this campaign acquire in 2012, what is the lifetime value of these new customers?

## Are There Diminishing Returns to Marketing?

- A CFO is interested in how the total returns to marketing spending have changed over the last two years since the new CMO was hired. Average ROI is the right measure to use

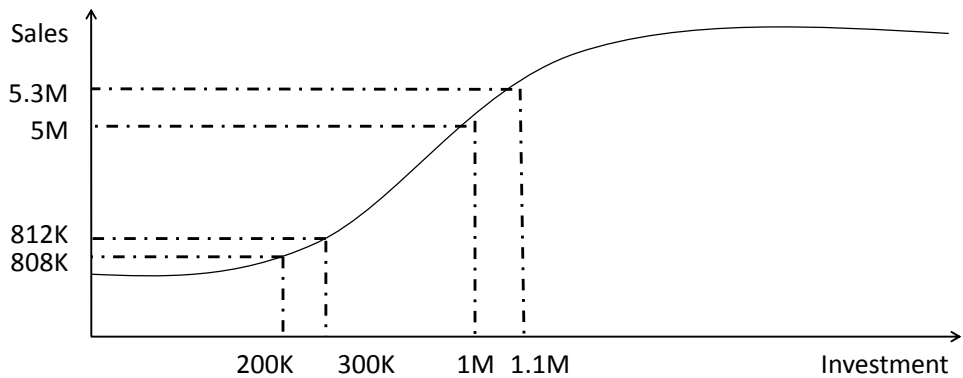
*For linear models, average and incremental returns are the same.*



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## Are There Diminishing Returns to Marketing?



*In the presence of diminishing returns the current level of investment matters when calculating incremental returns.*

## A Generational Platform Shift in St. Peter's Square



Photo Credit: Ruth Lozano  
<https://www.flickr.com/photos/ruthbruin2002/255296864>



Photo Credit: Flavio Ensiki  
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# The Coming of Age of Digital

106 MM+ viewers

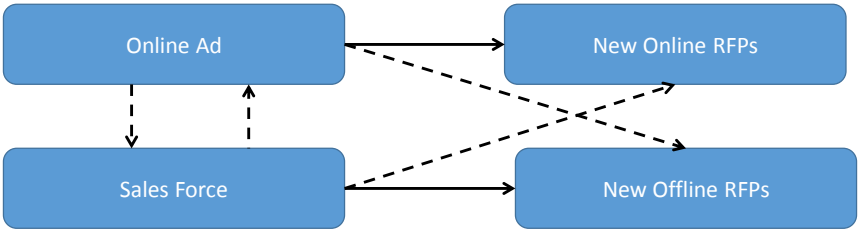


Image Credit: Austin Kirk  
<https://www.flickr.com/photos/aukirk/8468823259>

350 MM+ views



## Synergy of Offline and Online Advertising – Intuit





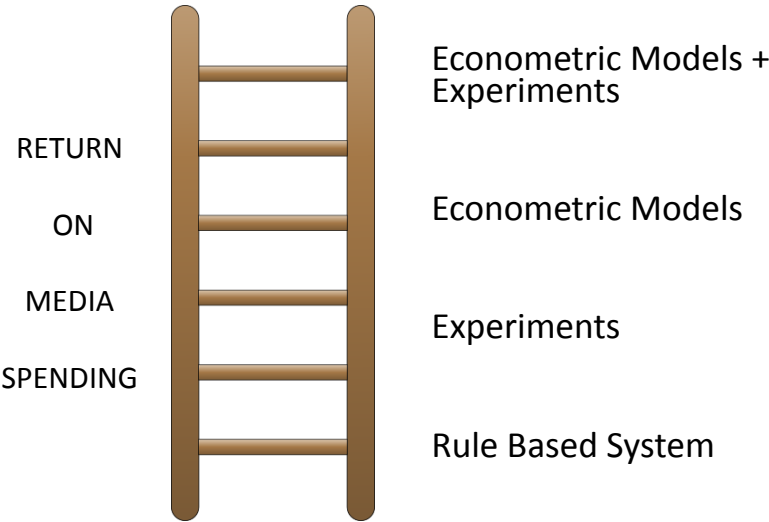
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## Too Many Paths to Purchase

Customer Number	First Interaction	Second Interaction	Third Interaction	Request Proposal
1	Display ad	Organic search	Email	Yes
2	Sales force	0	0	No
3	Organic search	0	0	No
4	Sales force	Organic search	Email	Yes
5	Email	0	0	No
6	Display ad	Sales force	0	Yes





## Media Attribution Ladder



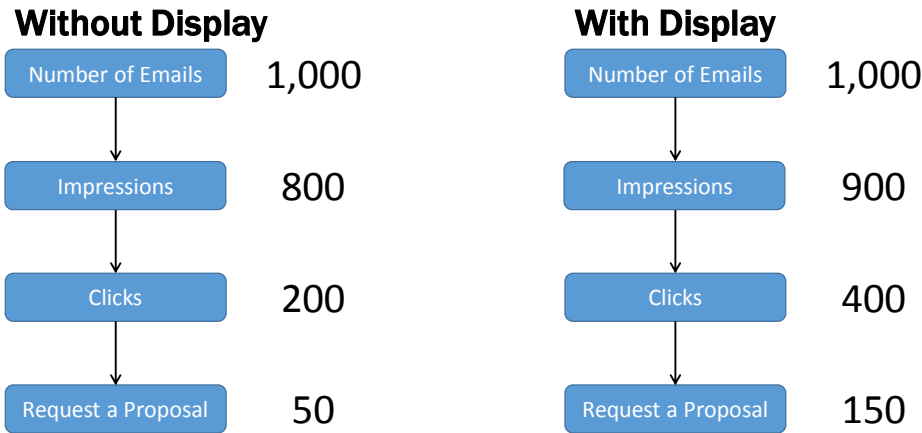
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## Rule Based System

Attribution Rule	Media Weight	
	First	Second
 <b>Last interaction</b>	Email	Sales force
 <b>First interaction</b>	Display	Sales force
 <b>Linear</b>	Display, sales force, organic, email	
 <b>Time decay</b>	Email, sales force	Organic search

## Experiments – Customer Purchase Funnel



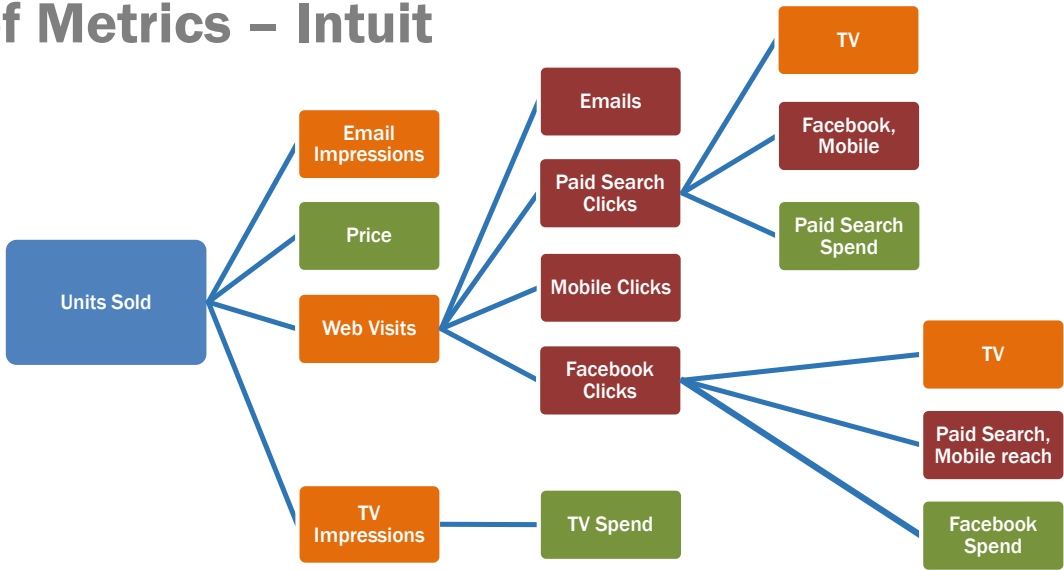
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## Synergy Between Email and Display

Email Metric	Without Display	With Display	Lift in Email Metrics From Display
Impression rate	80%	90%	112%
Click through per impression	25%	44%	176%
Click through conversion	25%	38%	150%
Email conversion	5%	15%	300%

## A Media Mix System of Metrics – Intuit



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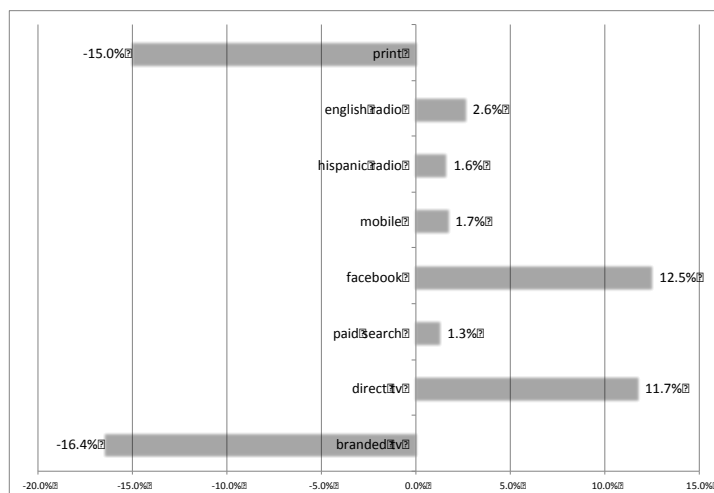
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## Attribution Model Inferences

- Sales =  $f(\text{lagged sales, web visits from search....})$
- Web visits from search =  $f(\text{lagged web visits from search, paid search clicks, mobile search clicks})$
- Paid search clicks =  $f(\text{lagged paid search clicks, TV spend, paid search impressions, display impressions})$

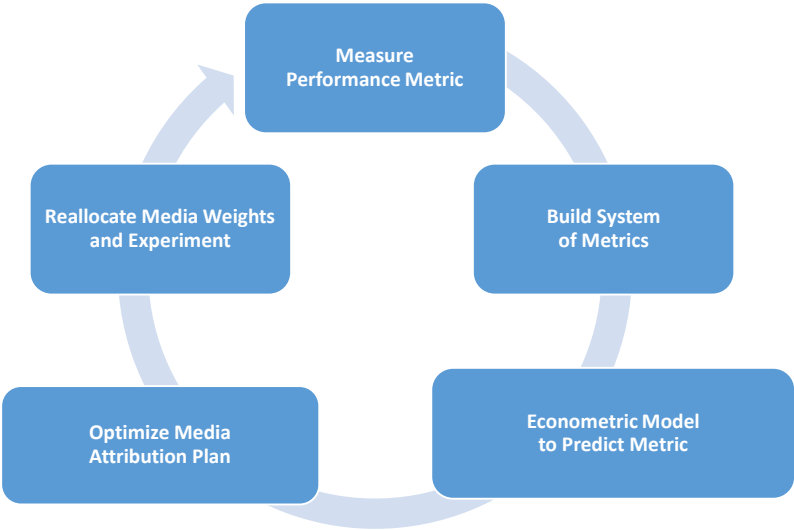
## Media Reallocation Increased Unit Sales Year-Over-Year by 17%



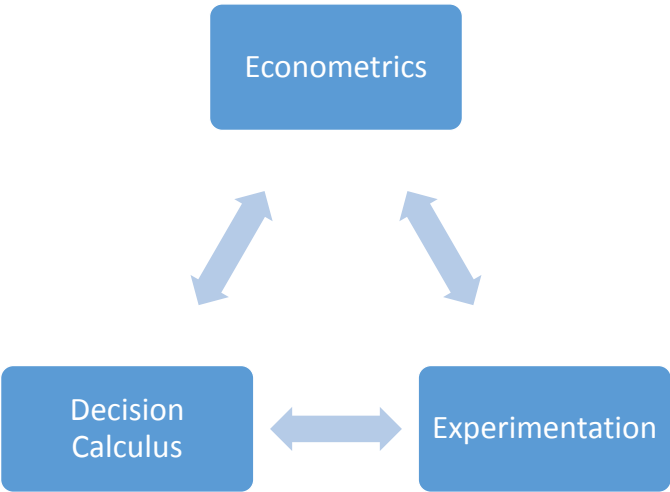
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## Continuous Improvement Process



## The Three Pillars



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## Conclusion

- **Marketing resource allocation is a process that requires continuous improvement and feedback loops.**
- **It requires one to combine intuition, statistical analysis and experimentation.**
- **The system of metrics is a good first step in the resource allocation process.**