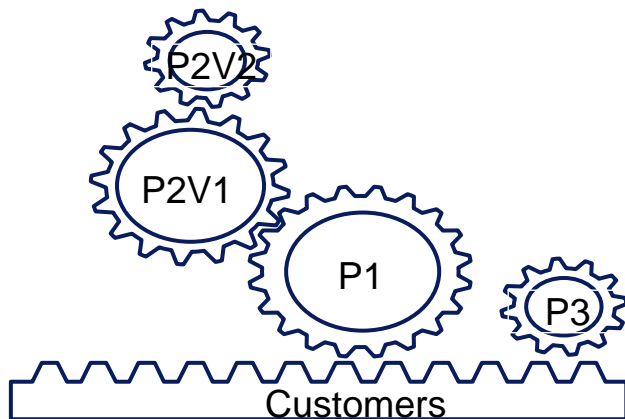


- **Cross-sell** sells new products to existing customers by identifying the product relationship and consumer spending behavior.
- **Up-sell** applies the relationship between old and new products in same line, to sell new upgrade products to existing customers.



Product- Product relationship

- To analyze the relationship and replacement between business and products (upgrade)
- To find appropriate products portfolio and upgrade approach

Customer-Product Relationship

- To analyze different customers' products interesting characters
- To find sales opportunities by different customers for related product

Associate Analysis

To provide data support for products' cross-sell, up-sell and new product development.

Response Analysis

Through response model, to lift response rate and output target customer list

Product

Association

Lift Confidence

Website Recommended Products

Fully Reversible Cushions



Egyptian Cotton Towels



456

41%

J Jasper Towels



- ☛ Confidence: **41% of people** who purchased Fully Reversible Cushions also purchased Egyptian Cotton Towels.
- ☛ Lift: People who purchased **Fully Reversible Cushions** were **456 times** more likely to purchase the Egyptian Cotton Towels compared to the general population.

What's predictive modeling?

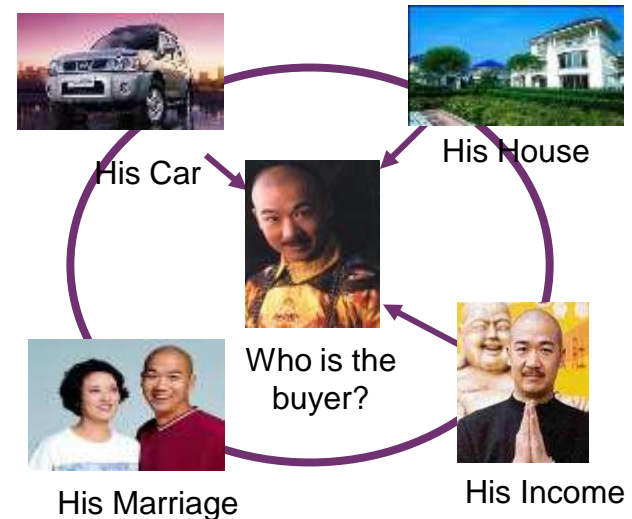
- Establishing a functional relationship between a set of explanatory or independent variables X_1, X_2, \dots, X_p with the Response (Dependent variable Y)
- $Y = f(X_1, X_2, \dots, X_p)$
- Methodology of building predictive models: logistic regression, decision tree, discriminant analysis, and linear regression.

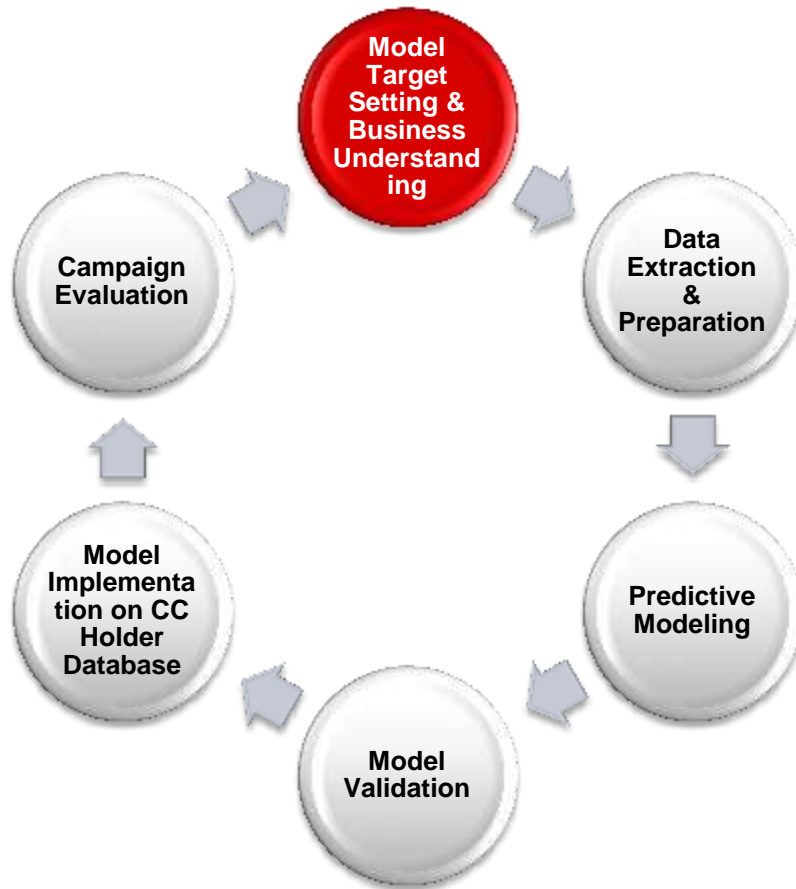
Why predictive modeling?

- We can build predictive model to help us target customer more accurately, limit cost of marketing, and drive maximum of customer value.
- We can forecast the target customers response or not.
- We can prioritize target customer based on different data source.

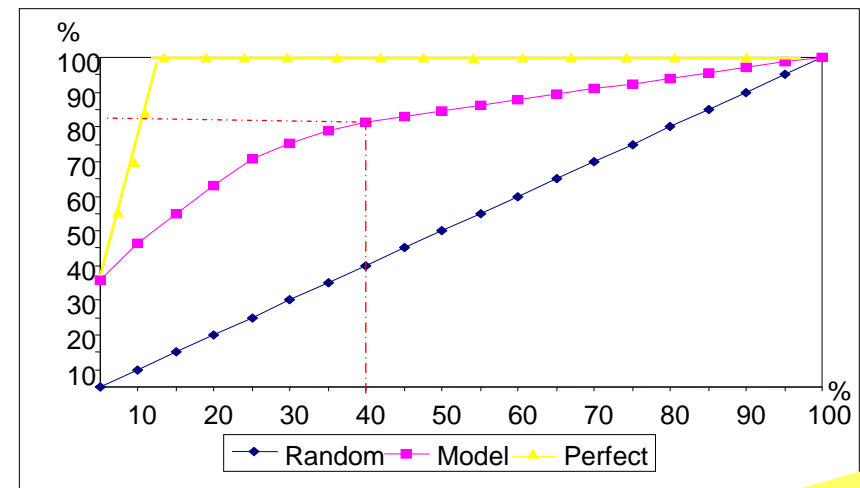
- Mr. Zhang's monthly income is RMB 100,000 and he has 1 child with a big house. He has a car of Paladin. Ms. Wang's monthly income is RMB 20,000 and she is single. She has no car and no house. Mr. Chen monthly income is 500,000 and he is married but has not children. He has 2 cars, Mercedes-Benz and BMW, and 2 houses.
- *What's probability of Mr. Zhang, Ms. Wang and Mr. Chen to response to the campaign?*

Example





The Gain Charts indicates the gain over Random that the Model provides

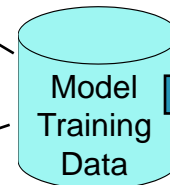


Sample

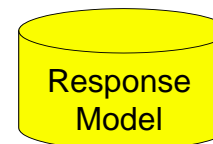
➤ The response modeling methodology includes 6 steps.

➤ 80% of the responders are captured in the top 4 deciles.

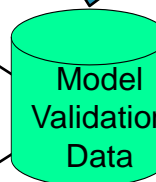
ID	Name	Gender	Age	Education	Email Status	Spending Amount	Frequency
1	Tracy	Female	30	bachelor	Yes	5000	3
2	David	Male	40	master	Yes	10000	6
3	Lisa	Female	25	bachelor	No	600	2



Algorithms



$$P(y|x) = \frac{e^{\alpha + \beta x}}{1 + e^{\alpha + \beta x}}$$



Sample

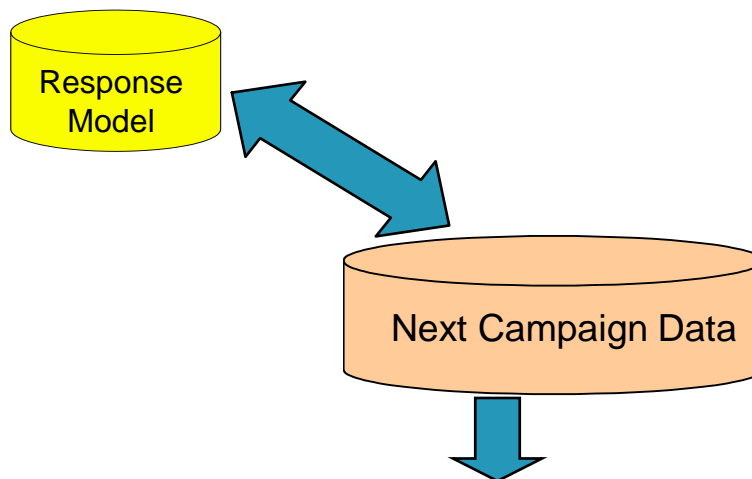
60% of

Campaign Reached Customers in Jul.-Dec., 2008
Vs.
Spending Amount improved 10% Customers
in Jan.-Jun., 2009

ID	Name	Gender	Age	Education	Email Status	Spending Amount	Frequency
12345	Jessie	Female	50	master	No	500	5
12346	Tom	Male	35	master	Yes	5000	10
12347	Jenny	Female	20	bachelor	Yes	1000	2

40% of

Campaign Reached Customers in Jul.-Dec., 2008
Vs.
Spending Amount improved 10% Customers
in Jan.-Jun., 2009



ID	Name	Response Scoring Rank from Highest to Lowest
12345	Jessie	0.95
12346	Tom	0.93
12347	Jenny	0.85
-----	-----	-----
15000	Tony	0.5
25000	Nancy	0.2

{ 1st decile
 { 2nd decile
 { 3rd decile