# Static and Dynamic Uplift Modelling

Customers can be classified into four groups based on their response to marketing actions.

1. Customers who always buy the product irrespective of the offer (Always buy).
2. Customers who never buy the product irrespective of the offer (Never buy).
3. Customers who buy the product if and only if they get an offer (Persuadables).
4. Customers who will stop buying product if they get an offer (Do not touch)

The company will lose the offer amount if they send the offer to always buying customer whereas they will lose advertising cost if they send it to a never buying customer. The consequences of sending offers to ‘Do not touch’ customers are even worse. A company’s net revenue for a marketing campaign can be optimized by precisely targeting persuadable customers.

|  |  |  |  |
| --- | --- | --- | --- |
|  | | **Offer** | |
| **0** | **1** |
| **Purchase** | **1** | **Always Buy** | **Persuadable** |
|
| **0** | **Never Buy** | **Do not touch** |
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## Static Uplift Modeling

The objective of most of the direct marketing campaigns is to identify persuadable customers and send offers specifically to these customers. A very basic method of building an uplift model to identify persuadable customers based on their static attributes is as follows.

1. Customers with similar static attributes like income, age, city, gender etc. are separated into control and treatment groups.
2. Specific offer will be sent to the customers in the treatment group
3. Probability of purchase in control group is calculated as a function of static attributes
4. Similarly, probability of purchase is calculated for treatment group

Where is the vector of static customer attributes.

1. Uplift is the difference between and . It is the increase in the probability of purchase of a customer because of receiving an offer.

Model to predict uplift probability can be built by using the treatment and control group purchase data.

Early Uplift models concentrated on explaining the importance of using uplift rather than response rate.

Recent Uplift models concentrated on using various predictive modeling techniques like decision trees, logistic regression, Artificial neural networks, SVMs, Ensemble models for picking tiny signal between and

## Dynamic Uplift Modelling

The response of customers to marketing offers changes with time and frequency of offers they receive.

**Example:**

1. Customer frequently receiving offers from a firm won’t get much excited with a new offer.
2. Customer who received significant offers in the past won’t buy a new product without an offer.

Dynamic uplift modeling models uplift probability as a function of static as well as dynamic attributes of customers. Dynamic attributes of customers, in turn will be a function of static attributes and previous marketing actions.

1. Probability of purchase in control group =
2. Probability of purchase in treatment group =

Where

1. Dynamic Uplift =

Dynamic uplift tries to capture the changing trend in uplift probability because of marketing actions customers are exposed to with time.