



Making better business decisions with customer analytics

Frankie Chan

Agenda

ageas.

1. Introduction

2. Propensity Modelling

3. Case Study: Direct Marketing





Back in the Old Days...

ageas.

My local café knew exactly **what** I want for breakfast every morning, and **when** I come in...

We were also good friends.



Treating our customer **RIGHT**

ageas[®]

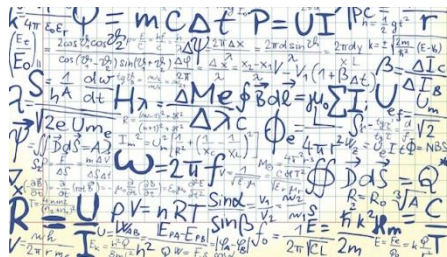


**But what
is right?**

But is this possible for a **BIG** business? ageas.



Customer Analytics Process



**Personalised
actions**



What can I expect from investing in customer analytics?

ageas.

- ✓ Higher customer satisfaction => Loyalty => Better risk
- ✓ Higher PPC (Product Per Customer)
- ✓ Higher Value*



*Value can be:

- Total Premium
- Customer level profitability to date
- Forecasted customer level profitability



Predicting Customer Behaviour using Propensity Modelling

Data Data Data....

ageas®

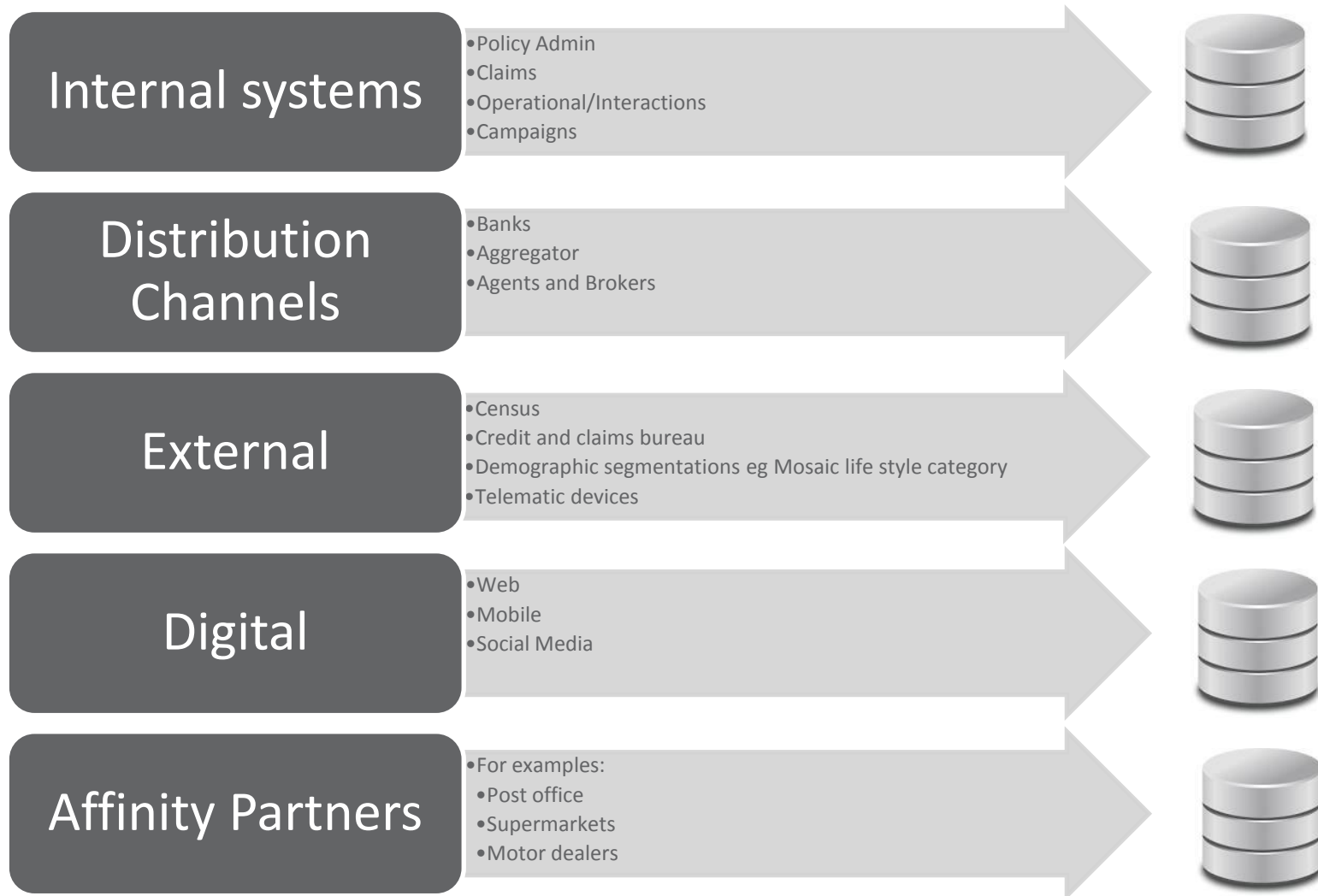
Our customers leaves us with digital footprint about almost everything they do

This provides us great opportunity to learn about their behaviour and preferences

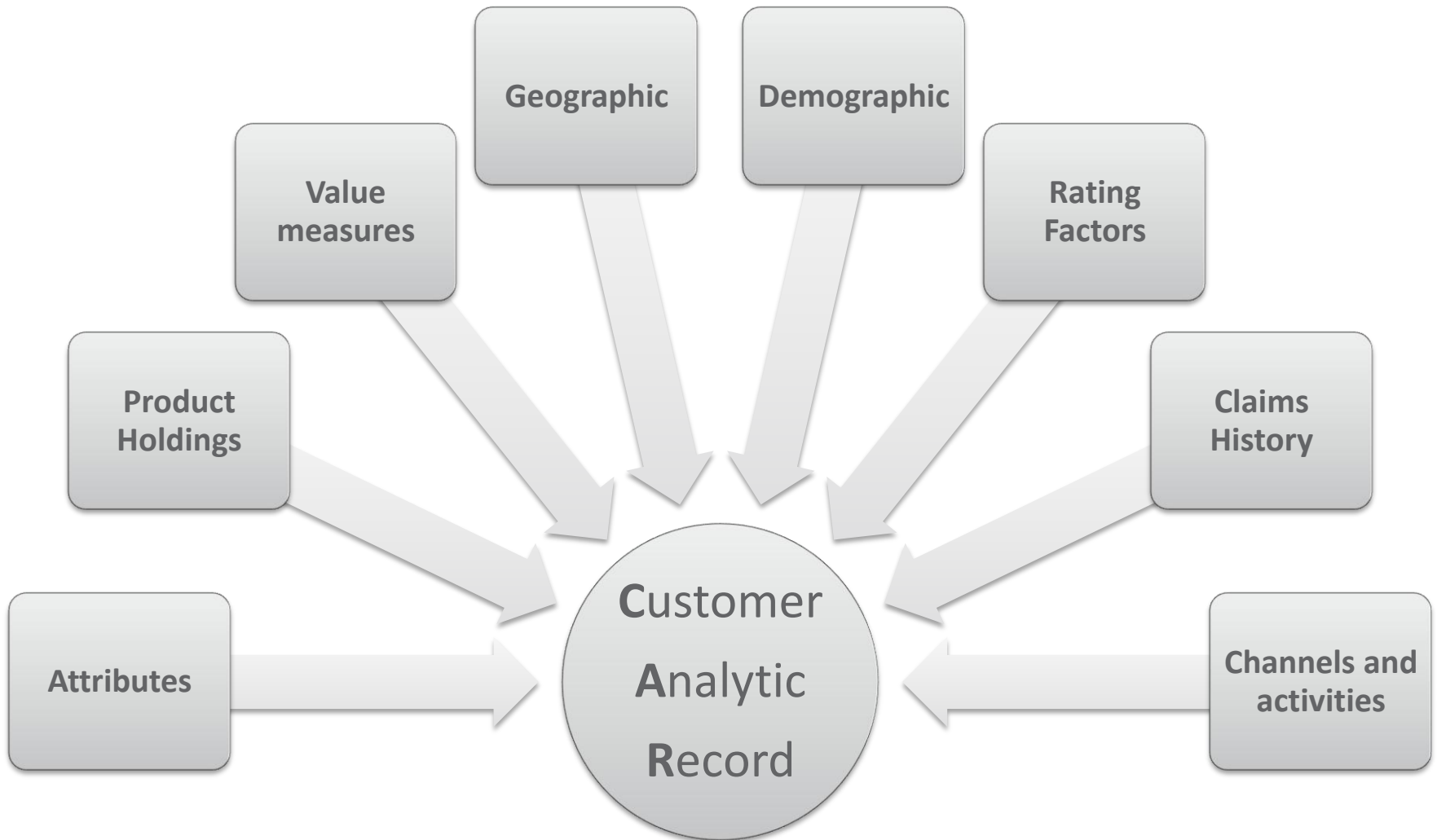


Where does data come from?

ageas[®]



Building a **CAR**



- Purpose is to **Learn** and **Predict**
- Identifies the drivers and quantify likelihood of a binary outcome (e.g. Take up/not take up, Renew/ not renew, fraud/no fraud etc)
- A range of Statistical and Data Mining techniques are available
- Logistic regression
 - Inputs: All potential drivers from CAR ($x_1, x_2, x_3 \dots x_p$) eg Age, Balance, # of products
 - Output: Probability score $\pi(x)$ between 0 and 1

$$\pi(x) = \frac{e^{\beta_0 + \beta_1 X_1 + \beta_2 X_2 + \dots + \beta_p X_p}}{1 + e^{\beta_0 + \beta_1 X_1 + \beta_2 X_2 + \dots + \beta_p X_p}}$$

Statistical vs Data Mining Techniques ageas®

Statistical models

- ☐ Has explicit distribution assumptions and structure
- ☐ Statistical tests are performed in variables selection
- ☐ Require more of users input and judgment
- ☐ Traditional method, can work with little (volume) data
- ☐ Examples:
 - ☐ *Logistic regression*
 - ☐ *Generalized Linear Models (GLMs)*

Data Mining or Machine Learning Models

- ☐ Use computer (or Artificial Intelligence) algorithm for model developments
- ☐ Has little or no distribution and structural assumptions
- ☐ More automated and requires less users input
- ☐ Generally more data hungry
- ☐ Examples:
 - ☐ *Decision Tree*
 - ☐ *Neural Networks*
 - ☐ *Random Forest*



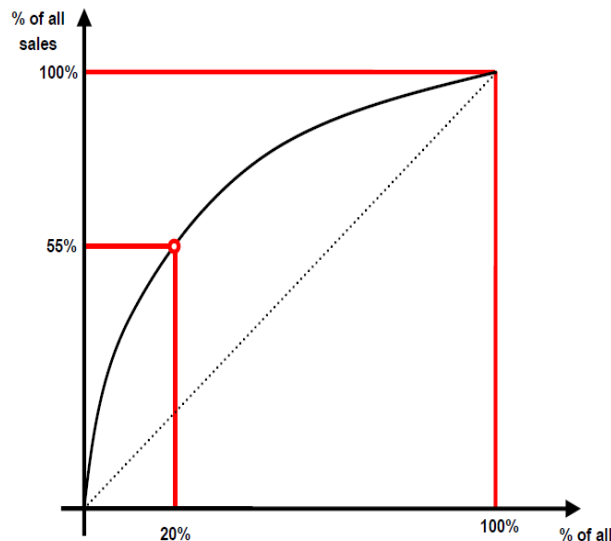
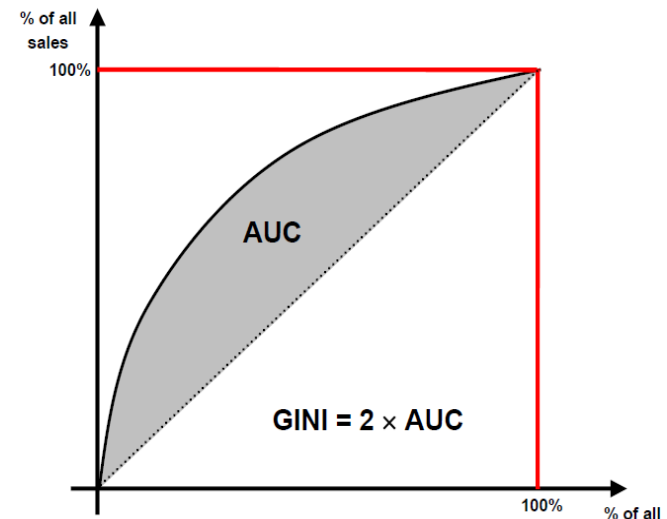
Assessing the Goodness of Fit of and across Propensity Models

- **Lift Curve:**

- A visual way to “see” the performance of the model. It ranks the customers’ score and plot the “Yes” proportion.
- A curve to the left of the dotted line implies the model has predictive power
- Can overlay multiple life curves and compare multiple model performance simultaneously

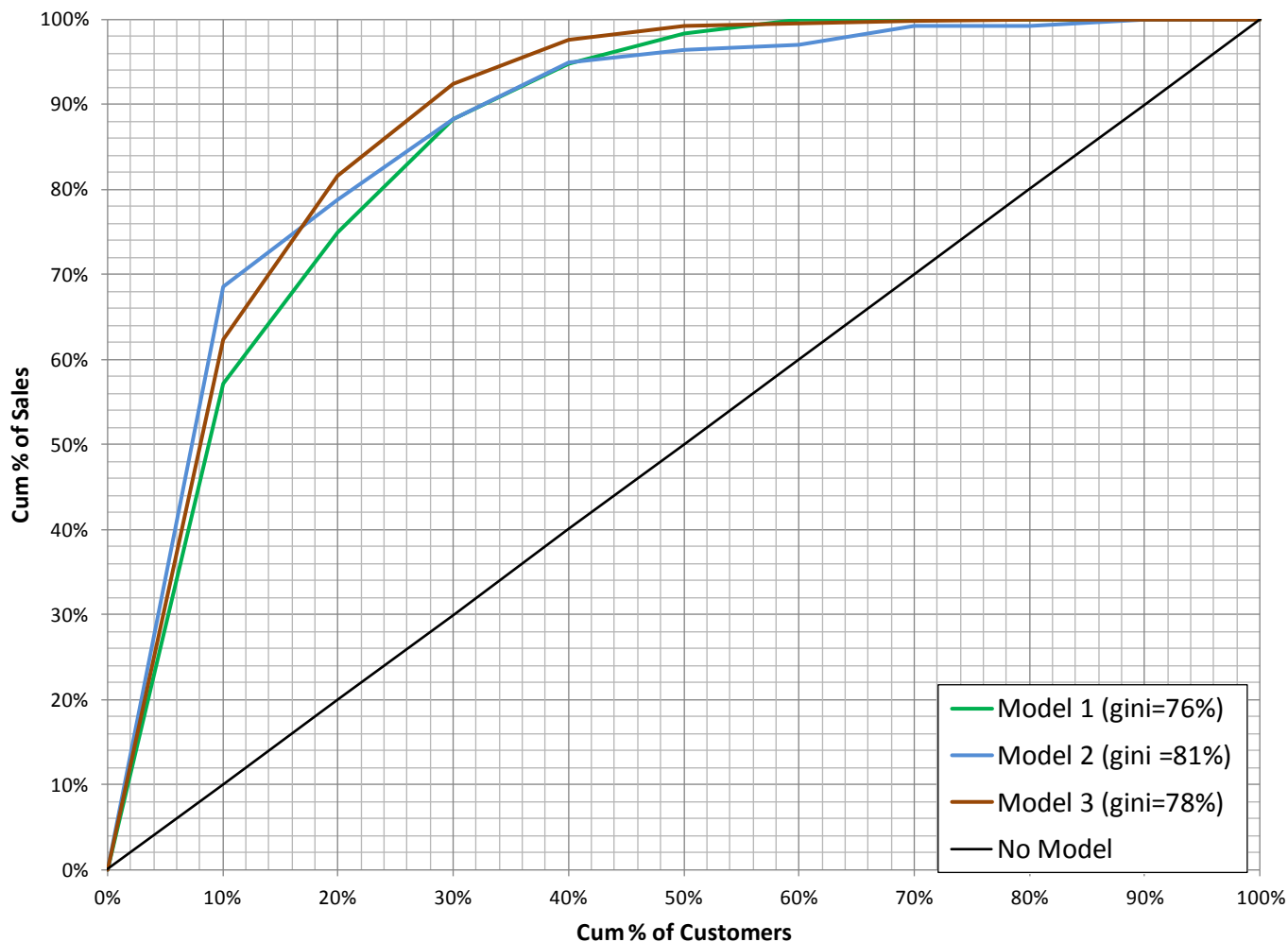
- **Gini:** A single number (between 0 and 1) which represents the Area Under Curve (“AUC”)

- Both measures can be used to compare models built using different methods e.g. logistic regression and decision tree



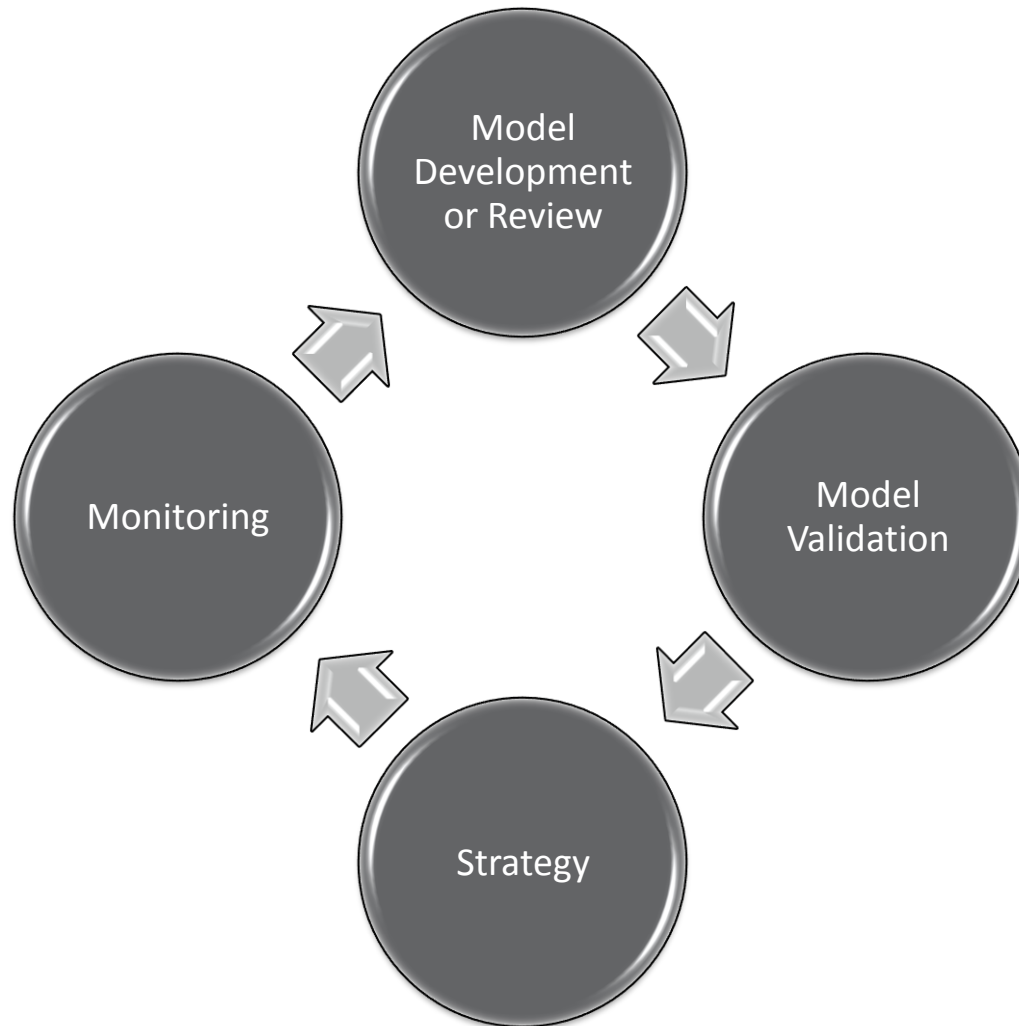
Comparing between models

ageas



Which model will you choose if you target only 10% of the sample?

What about 20%



Oh No my model seems to stop working....

Minor Service

Model rescaling: Adjust the model score, not the ranking, to realign to observed experience

Major Service

Model reweight: Refit the model using existing structure and variables

Model Enhancement: Model reweight with new/additional data e.g. feedback loop (the customer was targeted 3 months ago and did not respond)

Retire and redevelop





Case Study

Direct Marketing
Etika, Malaysia

Modelling the Behaviour of Personal Accident Customers

ageas.

The Problem

Response rate



The Solution

Two models were built:

1. Propensity to Take up,
2. Propensity to Lapse upon take up

Banking data was used



Examples of Model Inputs

Customer

- Age, Gender, Income, Marital Status, Tenure, Occupation, Geography etc

Product Holding & information

- Type & Number of Products

Banking

- Deposit and Lending Balance
- Credit score
- Internal segments

Claims

- Number and total claim size

Activity/ Feedback loop

- Historical marketing activities and response
- Have they done this (eg accepted DM?) before?

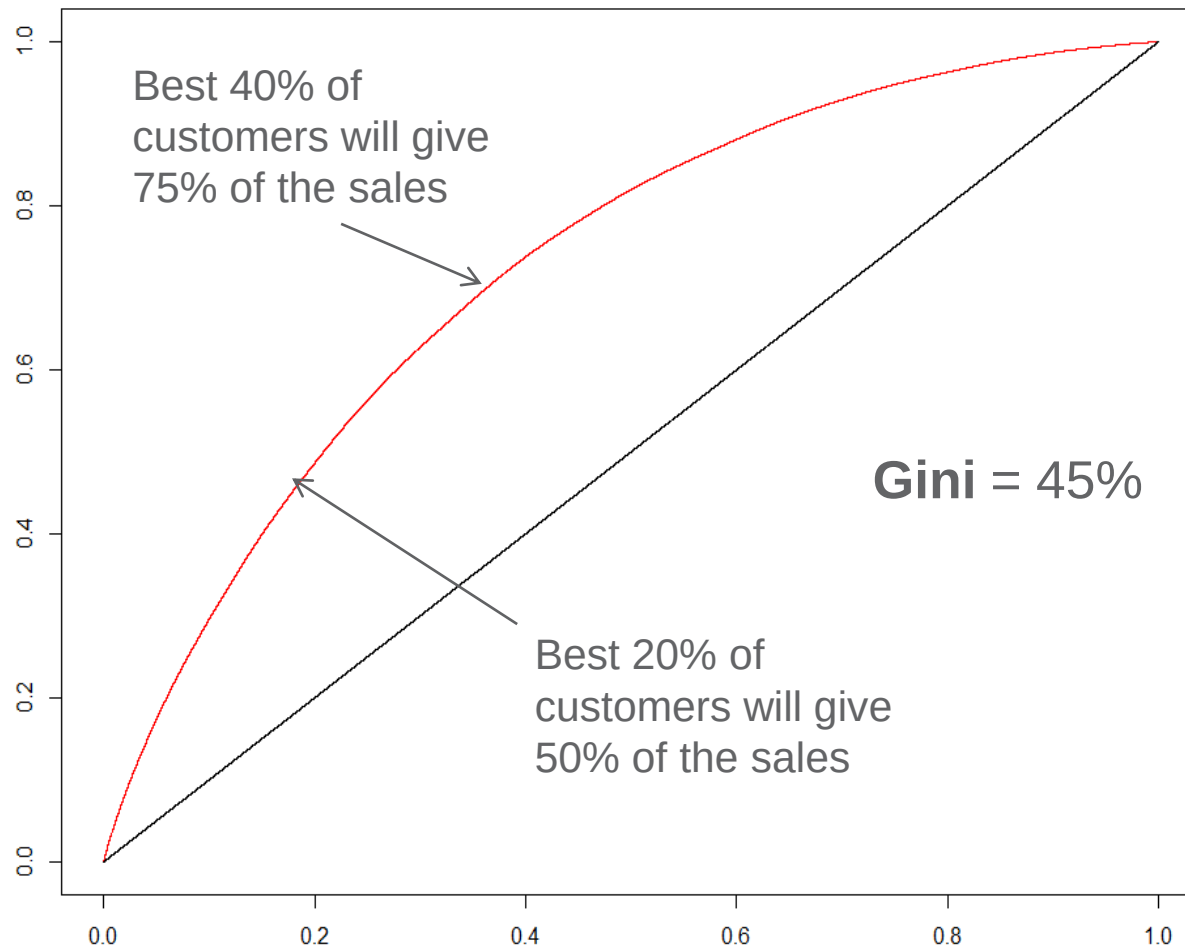
External

- Bankruptcy
- Insurance claims



Example Model

Lift Graph for Propensity Model: AUC = 0.727



Profile of customers likely to take up a new PA

ageas.



- Has more than 3 products with the Bank
- Low or unstable income, likely to be Blue collar
- Low deposit balance and insurance holdings

Profile of PA holders likely to lapse

ageas®



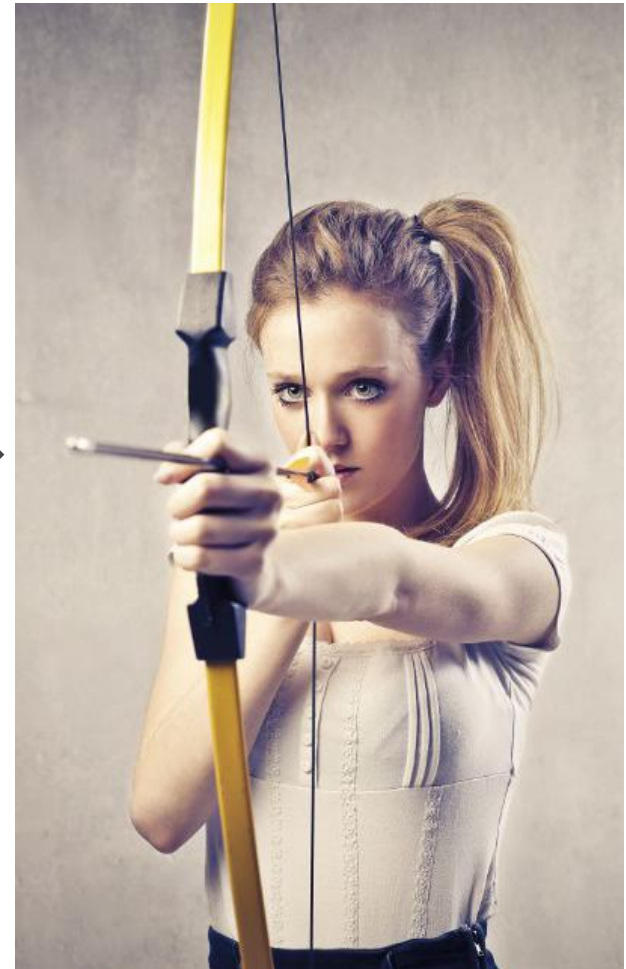
- Policies purchased through Telemarketing
- Small deposit balance < \$250, no lending
- Low/no income /Blue collars

What Do I Do With The Models?

ageas.

Exclude
Customers
with low
scores

Target Customers
with high scores



Likely to Buy

Likely to Lapse		Low	High
	Low		
	High		

Response rate *more than doubled!*

Lapse rate is *expected to halve*



Questions?

ageas[®]





Thank you for your participation