



# Implementing a CRM Analysis Challenges and Solutions

Data Mining User's Group  
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# Agenda

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- Redwood Data Sciences Approach
  - Client's Objectives and Redwood Data Sciences Solutions
  - Road to Solutions
    - ExCEL Implementation
    - Data/Process Infrastructure
    - Audience Selection
    - Experimental Design for Measurement
    - Merchandise Analysis
  - Where are we now? & What does the future hold?
- General Approach
- Application (Case Study)



# Redwood Data Sciences Approach

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ExCEL (Expanded Consumer Engagement Lifecycle) - Redwood has created a 5-stage sales process, which provides strategic framework to manage its customer base and apply to direct marketing tactics. Purpose is to consider the consumer at each stage of a purchase cycle; from initial inspiration through to post purchase.

DM Message - Each DM initiative should contain a message making the value of purchase clear to the consumer and call to action, if applicable.

Communication Plan - The communication plan and business (engagement) rules will ensure that an individual consumer is not overloaded with marketing communication and that all communications are synergistic with one another.

Segmentation/Modeling – All consumers (customers & prospects) are to be segmented based on their current and future value. This segmentation will determine which DM tactics the consumer will receive.

Measurement - An aggressive measurement plan to be built to coincide with the communications plan. Each tactic will be measured for its' individual performance / impact as well as its' overall performance/impact on the yearly results. Each measurement objective is to be derived from an applicable business objective; each business objective is to be mapped to a quantifiable metric in the experimental design.



# Client's Objectives & Redwood Data Sciences Solutions

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- Client: Company in Home Renovation Industry in US
- Objective: Development and implementation of the overarching communications strategy for two unique types of customers in order to increase sales and raise brand awareness:
  - Customers who engage in home renovation projects (simple and complex projects)
  - Customers who purchase regular home renovation merchandise (products)



# Client's Objectives & Redwood Data Sciences Solutions

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- Milestones on the Road to Solutions:
  - Understanding Business (e.g. visiting stores, interviewing stakeholders)
  - Bringing data from different sources together and working with different teams to achieve success
  - Working with a third party company to develop, implement and measure results of solutions



# Client's Objectives & Redwood Data Sciences Solutions

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- Solutions:
  - Implemented ExCEL, Redwood's communication strategy, to guide the development of DM plan. ExCEL identifies and tracks customers from initial inspiration through to post-purchase and customer maintenance.
  - Built the required infrastructure to support the DM communications and the applicable measurement.
  - Created both a customer (Retention Model) and an acquisition (Response Model) segmentation strategy.
  - Generated an experimental design for ROI measurement of all ExCEL elements.
  - Performed Merchandise Analysis (customized market basket analysis) to guide trigger mailings strategy.



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# Road to Solutions:

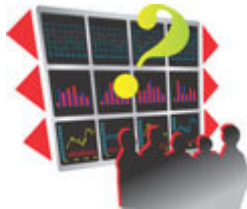
Questions



Data Exploration  
Learning  
Challenges



Solutions



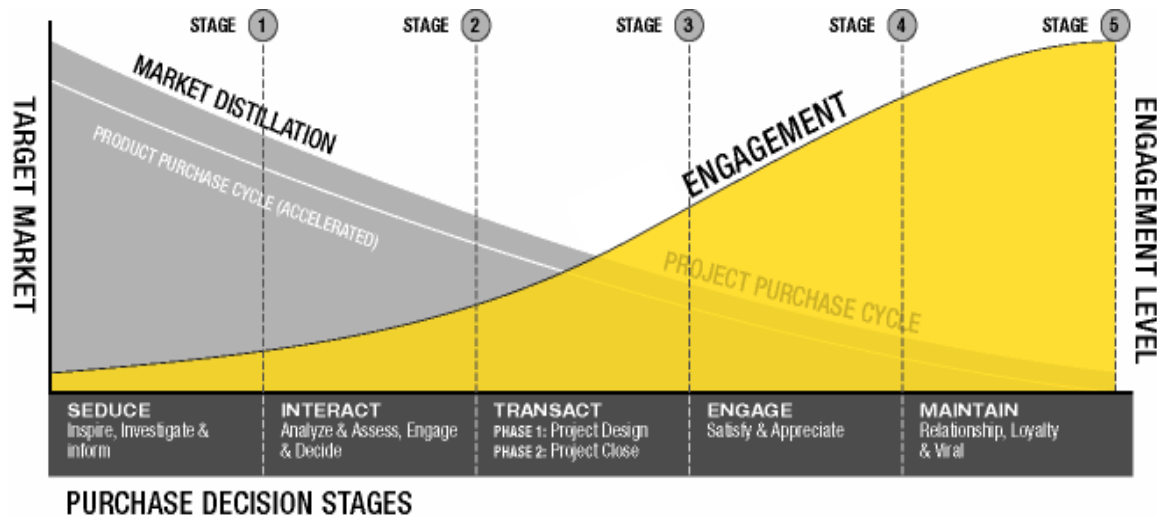
# ExCEL Implementation

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**Solution:** Implemented ExCEL, Redwood's communication strategy, to guide the development of DM plan. ExCEL identifies and tracks customers from initial inspiration through to post-purchase and customer maintenance.



# ExCEL Implementation



**Stage 1:** “Wow, I want my home to look like that too!”

**Stage 2:** “Wow, this is a big investment, am I sure that I want to do this?”

**Stage 3:** “I am excited and apprehensive, but I have made my decision – it’s this company!”

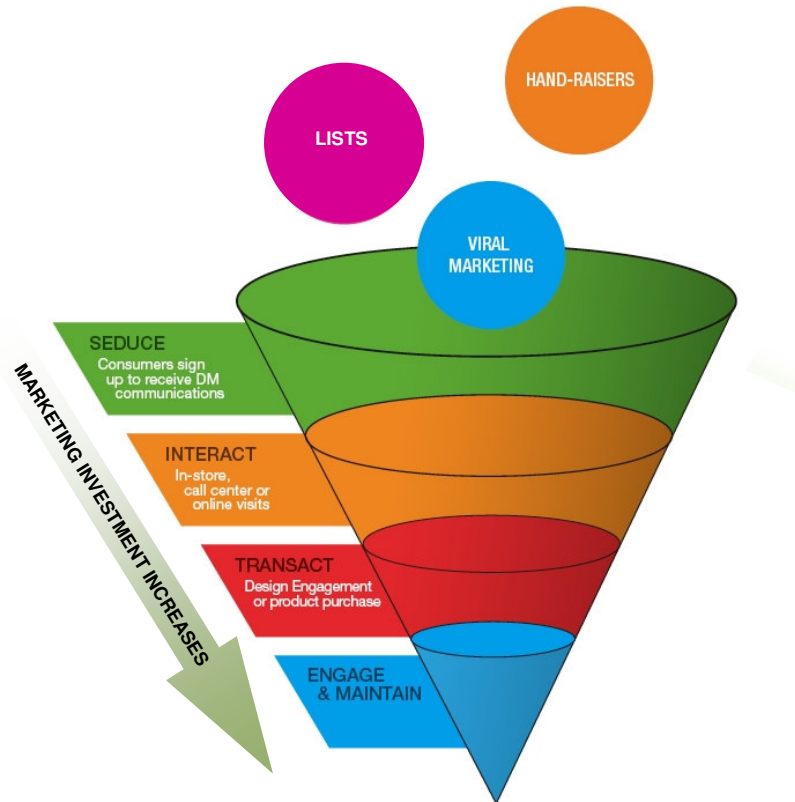
**Stage 4:** “I am really glad I chose this company, they are taking care of my needs!”

**Stage 5:** “I am so happy with my renovation – I will recommend this company to all my friends and family!”

## Benefits of ExCEL

- Ensures the timeliness and relevancy of the communication message.
- Is flexible; the consumer can move through at their own pace.
- Takes into consideration the two unique purchase cycles: (1) project purchase (approx. 18 months) and (2) product purchase (may occur in a single visit).
- Maintains contact with consumer post-purchase.

# ExCEL Implementation



Managing the prospect through an acquisition funnel is key for identification of the optimal marketing investment at each stage. As each prospect moves down the funnel, they will become more qualified; a “hot” prospect; the marketing investment will increase at the same rate.

# Data/Process Infrastructure

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**Solution:** Built the required infrastructure to support the DM communications and the applicable measurement.

**Challenges:**

- Bringing data together from different sources/departments and linking it properly and efficiently as well as setting up an automated process to do this on ongoing basis
- Working with a third party company to implement all required changes and provide information for learning and exploration purposes
- Creating new variables for proper measurement (Department definitions had to be re-defined as Categories).



# Audience Selection

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**Solution:** Created both a customer (Retention Model) and an acquisition (Response Model) segmentation strategy.

**Data Available:** transactional data from many sources, accurate demographic data with high penetration (90%)

**Data Limitations:** non-credit card and non-project transactions could not be linked to individual customers

## Challenges:

- It was important to keep in mind that most DM initiatives were intended to have a 70%/30% retention/acquisition balance.
- Working with a third party company to implement all required changes, execute development and provide information for learning and exploration purposes



# Audience Selection

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Dwelling Type
Property Type
Market Value Decile
Home Market Value
Net Worth Indicator
Age
Homeowner/Renter
Length of Residence
Presence of Children
Estimated Household Income
Gender
Year Home Built
Home Square Footage
Marital Status
SOHO Indicator

**Demographic  
Variables Available**



# Audience Selection – Acquisition Model

## Methodology

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- Model Type: Logistic Regression Response Model
- Mailed Sample:
  - Original Definition: current customers of a sister company who had purchased in the last 12 months, live within a 50 mile radius of a store location and have never had a transaction at the store.
  - Original Size: over 600K.
  - Issues:
    - Requirement of having made a transaction in the last 12 months was not applied and have lead to 60% reduction in sample size
    - Entire sample was mistakenly required to have a sister company credit card active flag and reduced the scope to include only credit card customers (50% reduction).
- Data Used:
  - Respondents Definition: all prospects who have had at least on transaction in the one month time period following the mailing
  - Potential Predictors:
    - transactional data (at sister company) from the 12 months time period prior to the mailing
    - demographic data, credit card, distance traveled
    - payment preference, credit card balance and limit (these variables were recommended for consideration but were not available for the development of this model)



# Audience Selection – Acquisition Model Model Development

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- Issue: Low Respondents Counts due to the Mailing Error
- Model Development Approach:
  - Split Respondents into 56% Development and 44% Validation
  - Create two Non-Respondent samples for Development and one for validation.
  - Use two samples for development: same Respondents, different Non-Respondents
  - Use one brand new sample for Validation
  - Development samples are over-sampled
  - Final model results are assessed based on not over-sampled development samples and validation sample



# Audience Selection – Acquisition Model

## Respondent Profile

Predictor Variables	Effect on Response	Strength of Effect (rank)
House Square Footage	Positive	1
Total Visits (based on products and installs over a 12 months period)	Positive	2
An instance of purchasing in Electricity and Lighting Departments	Negative	3
House Market Value	Positive	4
Length of Residence	Negative	5
Net worth	Positive	6
Marital Status (single)	Negative	7

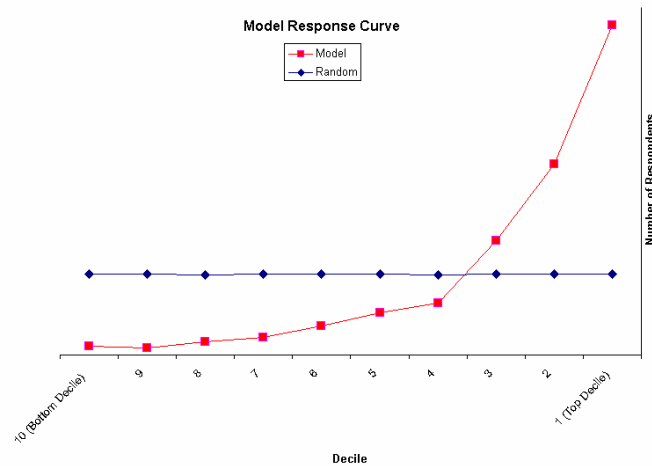
The following represents a profile of prospects who have a high propensity to respond. They are more likely to:

- Have a larger, more expensive home
- Have recently moved into their home
- Have a high income
- Be married
- Shop more frequently
- Tend not to purchase from electricity and lighting departments

Final Model contained a lot of demographic variables fitting the expected customer profile.

# Audience Selection – Acquisition Model Expected Performance

Decile	Lift
1 (Top Decile)	409
2	237
3	142
4	64
5	53
6	36
7	22
8	17
9	8
10 (Bottom Decile)	11



- Top 3 deciles perform better than the random; the random group response rate represents the expected response rate in the absence of the model.
- The implication of these results is that based on top 3 deciles performing better than the random, these deciles will be selected for mailings; selections of the remaining 7 deciles will be dependent on test results.

# Audience Selection – Acquisition Model Testing

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In-market Testing is performed to verify and confirm the modeling results:

- In market testing plan includes the testing of the top four deciles (the fourth decile was included in an attempt to identify the mailing potential of a lower decile) performance against the control and the overall random.
- Cells selected for mailing will be mailed twice within a short period of time. The mailed cells will be compared to the no mail control. Doubling up the mailings will ensure that the counts of respondents are large enough for significant and conclusive results.



# Audience Selection – Acquisition Model Results and Recommendations

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## Model In-market Testing Results

- The model was effective at identifying the right prospects (response rates lift in the top four deciles; decreasing response rate corresponding to rank order of the model decile) although the Direct Mail piece did not have any incremental impact on their purchase activity (mail and control results were similar).
- The Direct Mail was effective at increasing the average sale corresponding to the rank order of the decile (mail was higher than control for each decile and higher deciles had higher average sales).
- Acquisition ROI was the same as ROI for retention (first time in 2005/2006).
- For tested creative format, model based acquisition audience had highest ROI and highest positive lift in both response rate and average sales.

## Recommendations

- As the model is able to identify prospects more likely to purchase and there is no positive incremental lift in purchase rate, the Direct Mail piece must not be effective at inciting purchases. Areas to investigate are: format, offer, timing, relevancy, in-store activity and copy.



# Audience Selection – Retention Model Methodology

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- Model Type: Value Based Segmentation (communication strategy to be assigned to each segment to optimize the expected returns)
- Audience Criteria: All customers who live within a 50 mile radius of an open location were considered.
- Data Used:
  - Transactional data for 12 and 24 months depending on activity
  - Demographic data
  - Variables that were recommended but were not available: credit card balance and limit



# Audience Selection – Retention Model Methodology

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- Customer Types: Several main ways of differentiating customers were used.
  - Based on type of transactional activity:
    - Services and Products for Complex and Simple Projects
    - Products
      - Using company, sister company Credit Card or other credit cards
      - Not using Credit Card (not available)
  - Based on recency of activity in order to identify defectors and new customers:
    - Active/Non Active during the 12 or 24 months of measurement depending on transaction type while active prior to this time period (non-actives are potential Defectors)
    - Active for the first time after the measurement time period (Brand New)
- Based on customers potential (demographic data):
  - Home Owner/Renter
  - Household income:
    - more than \$100K (customers with the highest potential)/less than \$100K
  - Home market value:
    - more than \$350K (customers with the highest potential)/less than \$350K

CURRENT VALUE

POTENTIAL VALUE



# Audience Selection – Retention Model Model Development

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## Issues:

- Large proportion of customers were inactive in the past year or even two years
- Can not detect transactions which are not credit card, special order or project transactions (POS system limitations).



# Audience Selection – Retention Model Results

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The following details the customer segments for communication; they are grouped by a combination of future potential for growth, current value, purchase type behavior, purchase volume (frequency, average spend, number of items per transaction) and target audience profile elements (income, house value, house ownership, married)

## Active Customers

**Best Customers** – includes customers who are highly engaged

**Next Best Customers** – this group is believed to have the highest potential for growth and shows signs that the potential exists

**The Rest of the Customers** – the purchasing behavior of these customers is not indicative of customers who are highly engaged

**New** – customers in this group are brand new

**New Credit Card** – customers in this group are brand new credit card customers

## Non Active Customers

**Defectors** – includes customers who have not made a purchase within an expected time period

**DNR** (do not recessitate) – includes customer with no potential to increase their value



# Audience Selection – Retention Model Testing

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In-market Testing is performed to verify and confirm the modeling results:

- In market testing plan includes the testing each of the active segments and highest potential inactive segment performance against the control.



# Audience Selection – Acquisition & Retention Models

## Next Steps

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1. Test both acquisition and retention models during different times of the year to determine seasonality
2. Test both acquisition and retention models with different types of mailing formats
3. Determine what level/type of versioning can be applied
4. Determine optimal ratio for acquisition / retention audiences for communication strategy (70/30 or 60/40) for all creative formats
5. Upon ratio determination; apply to DM initiatives plan to identify audience size for mailing and testing
6. Retention Model refinement
7. Acquisition Model refinement and extensions (e.g. zip level model)



# Experimental Design for Measurement

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**Solution:** Generated an experimental design for ROI measurement of all ExCEL elements.

## Challenges:

- current DM strategy has very frequent mailings to a large number of people contributing to complexity of measurement
- data limitations (non-credit card and non-project transactions can not be linked to known customers and, therefore, transactional activity picture is not complete)
- involvement of the third party company
- significant market activity outside of DM (email, tab, store advertising) which may effect performance of control groups

## Elements of Solution:

- Designed standard and comprehensive measurement templates
- Designed most appropriate time periods for measurements
- Designed control groups to minimize the number of people not available for mailing without compromising the measurement results
- Measurement of effectiveness of new strategies on the Project/Product cycles, individual DMs, campaigns (several DMs).
- Stream approach implemented in Fall/06 to avoid too many touch points (design and measurement)



# Experimental Design for Measurement

## Example of Campaign Measurement

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### **Campaign Constraints:**

- Over 8M people to be mailed with a much smaller proportion of unique individual customers available and even a smaller number of customers recommended for mailing
- Time Period: 2 months
- Number of Mailings (DM pieces): 12
- DM Formats: 3

### **Design and Measurement Approach:**

- Do not measure each individual DM piece – measure them as a group instead ('Fall' Campaign/Communication Stream)
- Created one master control group for consumer group we wanted to measure.
- Expanded the mailing universe of people to accommodate the maximum number of touch point we want each consumer to have
- Used campaign constraints as an opportunity to learn more about lower potential segments
- Assigned the mailings to the same people as far apart as possible and in a logical manner
- Created several communication streams and assigned each of these streams to randomly split customer segments we wanted to measure. This allows for segment comparison without bias introduced by different mailing streams.



# Experimental Design for Measurement

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## Key Measurement Template Elements

- ROI (incremental gross margin spend versus cost) and its main drivers
- Distribution of Total Spend (complex projects, simple projects, products)
- Lift in response rate
- Lift in average sales
- Lift in gross margin percentage
- Lift and ROI calculated for different audiences as well as overall
- Storewide sales vs. category/sku specific sales (related to an offer, theme)
- Comparisons to benchmarks



# Merchandise Analysis

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**Solution:** Performed Merchandise Analysis (customized market basket analysis) to guide trigger mailings strategy.

## Elements of Solution:

- Adopted the principle of market basket analysis
- Asked clients about their thoughts based on experience and looked for answers to their questions so that analysis is focused and practical
- We considered a time period with multiple purchases as a ‘Market Basket’ due to the nature of purchases.
- Some analysis were based on the sequence/order of events while others were not.
- ‘Events’ of interest were defined at various levels depending on what was the most appropriate (category, department, class, sub-class).
- Analysis included various additional information (e.g. profiles of various types of purchasers, post purchase behavior, installation attachment rates).
- Final analysis was a combination of smaller but focused analysis with results allowing the client to make key business decisions (e.g. proving/dis-proving common myths, identifying areas of improvement, trigger mailings, bundling offers).



## Where are we now? Results so far....

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- Test and learn approach and focused analysis with clear objectives and business implications have lead to significant learnings and clarity in the next steps.
- Audience optimization was key in driving positive sales activity and returns:
  - The number DM initiatives with positive ROI increased dramatically since the previous year.
  - The number of DM initiatives with positive lift in response rate almost doubled since last year.
  - The number of DM initiatives with positive lift in average sales more than doubled since last year.



## What does the future hold?

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- Continue to test and implement solutions that work
- Model re-scoring and adjusting
- Learn more about the customer segments and tailor communications to their needs
- Enrich existing data with Web and Email data





Questions?



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Thank you!