RFM Analytics for Direct Marketing

Workshop with Bentley University Students

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April 11, 2018

Precision Dialogue

An RR Donnelley Company

Today's Agenda

- *Brief* introduction
- RFM Analysis – a hands-on experience!
- Analyze results
  - *Your* tables
  - *My* table
- Implementation – *Now that I have it, what do I do with it?*

<<<where did this guy come from?>>>

2016 – "The Spin"

Lots of change! What hasn't changed?
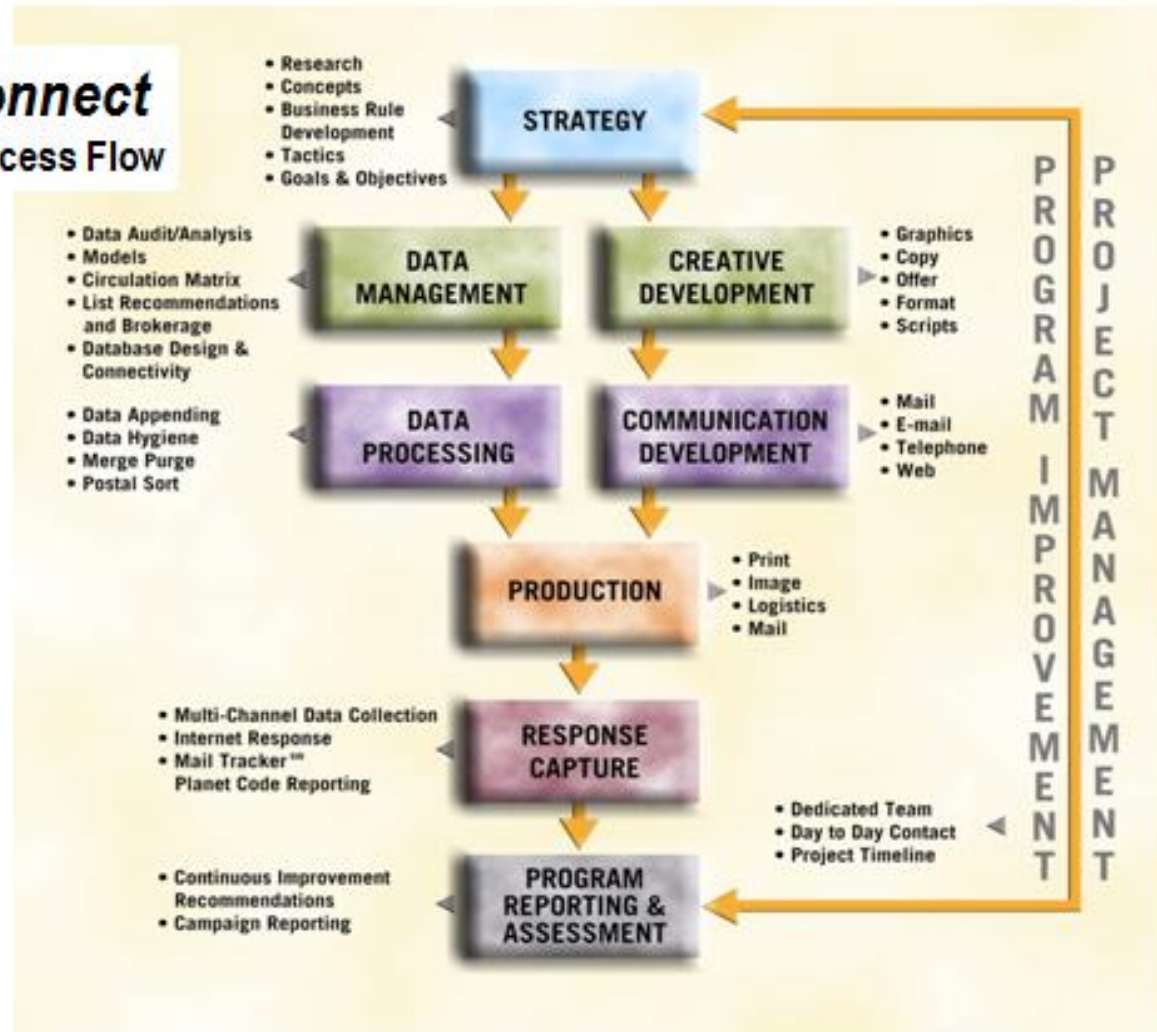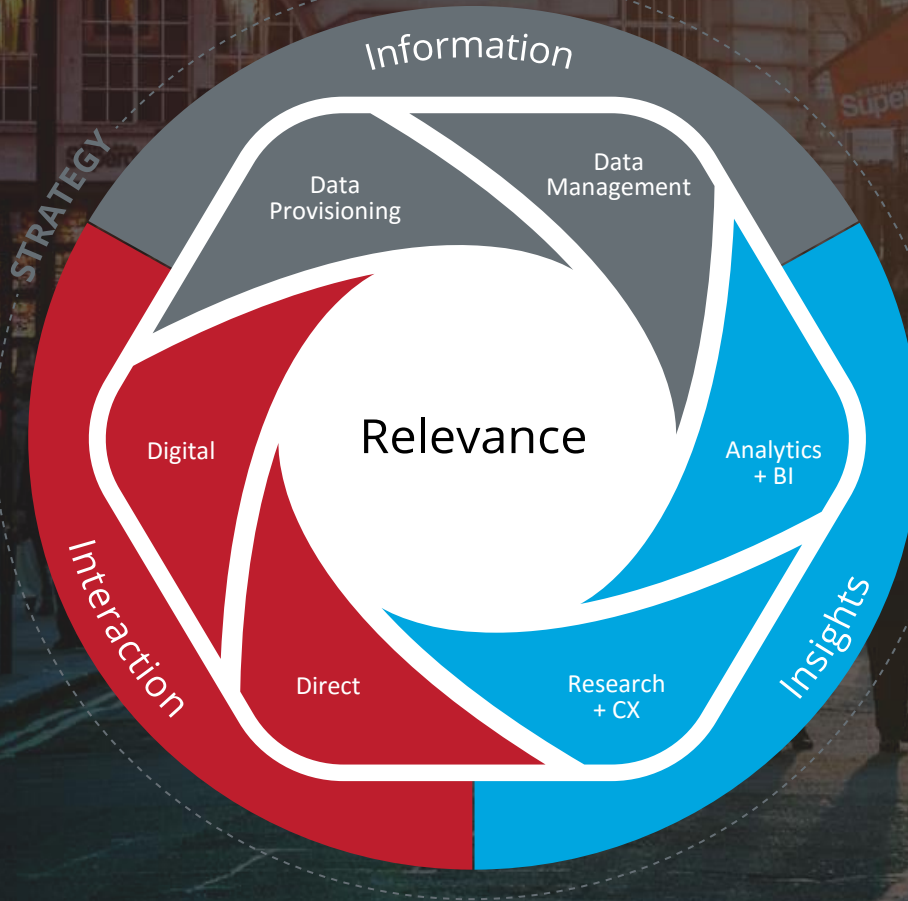
Customer Relevance Focus

Precision Dialogue

Analytics

Web   Direct Mail

Strategy ----> Data ----> Insights ----> Digital Variable ----> Relevant
Management   Content   Interactions

Email   Mobile

Research & Customer
Experience

Targeting Continuum

Targeting Ability (vertical axis)

Tool (horizontal axis)

Baseline Profiles
- Customized to client partner
- Not predictive

Syndicated Segments
- "Off-the-shelf" segments
- Based on geo-demographics
- Some DM response

Forecast Model
- Based on "look-alike" responders (walk-ins)
- Not based on DM campaign
- Better than profiling at capturing multiple variable relationships

Campaign Response Model
- Based on responders to mail campaign
- Captures natural response + marketing effect
- Able to calculate marketing effect to drive better ROI marketing decisions

RFM Analysis Overview

Frequency

Recency

Monetary

- Core component of retail loyalty programs

- Basis of segmentation to identify best / worst customers

  ✓ Considers life stage
  ✓ Communication driven by segment placement
  ✓ Prioritizes customers for attention

- In order to create a 'fair' RFM solution, all customers should have a minimum tenure on file

RFM Analysis Data

| customer	store	last sale da	number c	total sale	email	last nar	first na	phone	birthday	addres	addres	addre	city	state	zip code
60349881	6	1/3/2014	3	71.5	\			(999) 99	#######	1285 M(	\	\	HERDC	VA	20170
50010938	13	2/20/2015	10	325.83	SPOGUE			(301) 65	#######	8821 TH	\	\	MONT	MD	20886
50229798	5	9/10/2015	11	-132.95	\			(301) 98	#######	9917 CH	\	\	POTOI	MD	20854
1E+08	10	6/23/2013	2	138.95	\			(203) 87	#######	84 STAC	\	\	MILFO	CT	6460
50313358	5	6/23/2013	6	281.55	\			(555) 55	#######	5812 W(	\	\	MIDLA	MI	48642
1.1E+08	11	9/25/2010	3	238.4	JACKS59			(000) 00	#######	162 SIGI	\	\	PHILAI	PA	19148
25647	2	5/26/2014	2	124.74	GAYLER			(301) 37	#######	9209 SL	\	\	DICKEI	MD	20842
50064759	5	10/17/2015	62	2003.77	JTABER(			(240) 35	#######	9508 EV	\	\	BETHE	MD	20817 2
1.3E+08	13	10/5/2012	26	1574.8	NATALII			(555) 55	#######	23140 P	\	\	Clarks|	MD	20871-4408
1.7E+08	17	7/3/2013	1	6.59	TANISH,			(999) 99	#######	344 SOI	\	\	YONKE	NY	10703
10024833	12	6/21/2011	2	0	CAROLY			(410) 72	#######	1540 TE	\	\	OCEAI	MD	21842
8E+09	9	1/4/2014	5	251.99	MICHELI			(999) 99	#######	1555 19	\	\	ARLIN	VA	22209 1444
90212162	9	9/18/2011	1	239.2	\			(540) 55	#######	900 N W	\	\	Arling	VA	22201-5909
90058223	14	5/27/2011	2	167.75	\			(703) 57	#######	3721 MI	\	\	ANNA	VA	22003 1547
15717	2	7/15/2012	1	-128	MUSH91			(410) 35	#######	5 Bank !	\	\	Owing	MD	21117-5117
53622	6	7/17/2013	3	79.44	ABROCH			(571) 32	#######	5335 LIT	\	\	ARLIN	VA	22207

UGLY!

- NCOA/CASS
- Deduped
- HH Aggregation
- Suppression
- Final Audit

Pretty!
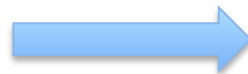
CustID	Store	Market	Target	LastSaleDt	Orders	Sales	State	ZIP
301	11	Retail	In Footprint	12/23/2012	7	107.2	PA	19054
801	11	Retail	In Footprint	5/8/2014	6	120.13	PA	19148
1002	14	Retail	In Footprint	8/27/2015	21	616.1	VA	20120
1061	800	Web	Web	1/23/2013	9	353.85	MD	21823
1064	800	Web	Web	7/21/2014	10	488.04	MD	21057
1095	1	Retail	In Footprint	12/29/2013	15	164.49	MD	21842
1178	800	Web	Web	1/27/2014	9	60	MD	21208
1196	800	Web	Web	2/23/2015	38	1252.91	MD	20817

Your Mission: Create the RFM Grid

Clues:

- Think like a 5x5x5 cube (R*F*M)

- Arithmetic is your friend

- Set the time machine back to 11/01/2015

- *"I'd say that's a nice revenue value, but per order, it's only average!"*

- Two useful Excel features: VLOOKUP and the trusty Pivot Table

RFM Template

Count of CustID		Monetary					
Recency	Frequency	Up to $20	$20 - $33	$33 - $47	$47 - $68	Over $68	Grand Total
0-12 Months	1 Order	0	0	0	0	0	0
	2-3 Orders	0	0	0	0	0	0
	4-6 Orders	0	0	0	0	0	0
	7-14 Orders	0	0	0	0	0	0
	15+ Orders	0	0	0	0	0	0
0-12 Months Total		0	0	0	0	0	0
13-24 months	1 Order	0	0	0	0	0	0
	2-3 Orders	0	0	0	0	0	0
	4-6 Orders	0	0	0	0	0	0
	7-14 Orders	0	0	0	0	0	0
	15+ Orders	0	0	0	0	0	0
13-24 months Total		0	0	0	0	0	0
25-36 Months	1 Order	0	0	0	0	0	0
	2-3 Orders	0	0	0	0	0	0
	4-6 Orders	0	0	0	0	0	0
	7-14 Orders	0	0	0	0	0	0
	15+ Orders	0	0	0	0	0	0
25-36 Months Total		0	0	0	0	0	0
37-48 Months	1 Order	0	0	0	0	0	0
	2-3 Orders	0	0	0	0	0	0
	4-6 Orders	0	0	0	0	0	0
	7-14 Orders	0	0	0	0	0	0
	15+ Orders	0	0	0	0	0	0
37-48 Months Total		0	0	0	0	0	0
49-60 Months	1 Order	0	0	0	0	0	0
	2-3 Orders	0	0	0	0	0	0
	4-6 Orders	0	0	0	0	0	0
	7-14 Orders	0	0	0	0	0	0
	15+ Orders	0	0	0	0	0	0
49-60 Months Total		0	0	0	0	0	0
Grand Total		0	0	0	0	0	0

Data Transformation: SAS

```
PROC UNIVARIATE <options> ;
     BY variables ;
     CDFPLOT <variables> < / options> ;
     CLASS variable-1 <(v-options)> <variable-2 <(v-options)>></ KEYLEVEL= value1
     | (value1 value2 )> ;
     FREQ variable ;
     HISTOGRAM <variables> < / options> ;
     ID variables ;
     INSET keyword-list </ options> ;
     OUTPUT <OUT=SAS-data-set> <keyword1=names …keywordk=names>
     <percentile-options> ;
     PPPLOT <variables> < / options> ;
     PROBPLOT <variables> < / options> ;
     QQPLOT <variables> < / options> ;
     VAR variables ;
     WEIGHT variable ;
```

Data Transformation: Excel

1. Calculated fields

Recency: (DATE(2015,11,1) – LastSaleDt) / 30.4375

Frequency: *actual value*

Monetary: Sales/Orders (*Average Order Value*)

2. Pivot table frequency analysis

3. Output

VLOOKUP(lookup_value,table_array,col_index_num,[range_lookup])
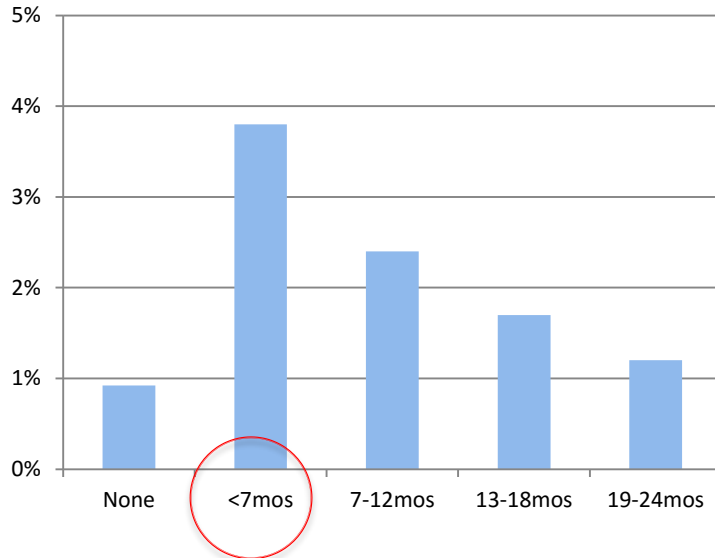*VLOOKUP table assigns bin labels to RFM range values*

RFM Template

Count of CustID		Monetary					
Recency	Frequency	Up to $20	$20 - $33	$33 - $47	$47 - $68	Over $68	Grand Total
0-12 Months	1 Order	0	0	0	0	0	0
	2-3 Orders	0	0	0	0	0	0
	4-6 Orders	0	0	0	0	0	0
	7-14 Orders	0	0	0	0	0	0
	15+ Orders	0	0	0	0	0	0
0-12 Months Total		0	0	0	0	0	0
13-24 months	1 Order	0	0	0	0	0	0
	2-3 Orders	0	0	0	0	0	0
	4-6 Orders	0	0	0	0	0	0
	7-14 Orders	0	0	0	0	0	0
	15+ Orders	0	0	0	0	0	0
13-24 months Total		0	0	0	0	0	0
25-36 Months	1 Order	0	0	0	0	0	0
	2-3 Orders	0	0	0	0	0	0
	4-6 Orders	0	0	0	0	0	0
	7-14 Orders	0	0	0	0	0	0
	15+ Orders	0	0	0	0	0	0
25-36 Months Total		0	0	0	0	0	0
37-48 Months	1 Order	0	0	0	0	0	0
	2-3 Orders	0	0	0	0	0	0
	4-6 Orders	0	0	0	0	0	0
	7-14 Orders	0	0	0	0	0	0
	15+ Orders	0	0	0	0	0	0
37-48 Months Total		0	0	0	0	0	0
49-60 Months	1 Order	0	0	0	0	0	0
	2-3 Orders	0	0	0	0	0	0
	4-6 Orders	0	0	0	0	0	0
	7-14 Orders	0	0	0	0	0	0
	15+ Orders	0	0	0	0	0	0
49-60 Months Total		0	0	0	0	0	0
Grand Total		0	0	0	0	0	0

RFM Table Counts

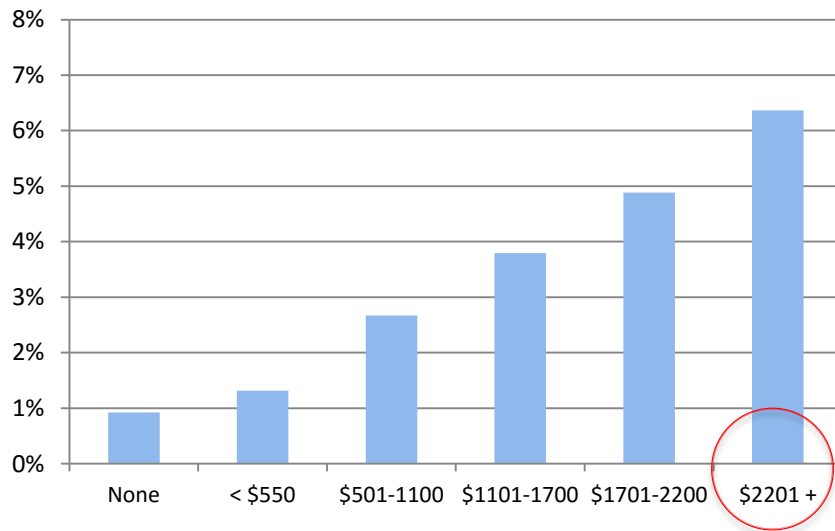| Count of CustID Recency	Frequency	Monetary Up to $20	$20 - $33	$33 - $47	$47 - $68	Over $68	Grand Total
0-12 Months	1 Order	4,886	5,807	5,768	5,308	10,172	31,941
	2-3 Orders	8,317	6,883	5,995	6,830	5,990	34,015
	4-6 Orders	5,542	5,489	5,473	5,519	3,195	25,218
	7-14 Orders	4,878	6,538	7,332	6,977	2,391	28,116
	15+ Orders	3,711	8,028	11,448	9,585	1,517	34,289
0-12 Months Total		**27,334**	**32,745**	**36,016**	**34,219**	**23,265**	**153,579**
13-24 Months	1 Order	4,173	4,668	3,661	3,744	7,575	23,821
	2-3 Orders	6,429	5,128	4,042	4,502	3,953	24,054
	4-6 Orders	3,853	3,482	3,167	3,126	1,844	15,472
	7-14 Orders	2,762	3,183	3,369	3,032	1,175	13,521
	15+ Orders	1,266	2,172	2,718	2,420	416	8,992
13-24 Months Total		**18,483**	**18,633**	**16,957**	**16,824**	**14,963**	**85,860**
25-36 Months	1 Order	4,149	4,396	3,209	3,361	6,415	21,530
	2-3 Orders	6,388	4,487	3,686	4,040	3,362	21,963
	4-6 Orders	3,621	3,224	2,728	2,531	1,369	13,473
	7-14 Orders	2,378	2,456	2,366	2,099	711	10,010
	15+ Orders	882	1,254	1,346	1,100	191	4,773
25-36 Months Total		**17,418**	**15,817**	**13,335**	**13,131**	**12,048**	**71,749**
37-48 Months	1 Order	3,422	2,404	2,350	2,487	4,398	15,061
	2-3 Orders	4,476	3,080	2,589	2,960	2,825	15,930
	4-6 Orders	2,513	1,988	1,804	1,828	1,191	9,324
	7-14 Orders	1,401	1,324	1,339	1,182	467	5,713
	15+ Orders	413	486	523	500	100	2,022
37-48 Months Total		**12,225**	**9,282**	**8,605**	**8,957**	**8,981**	**48,050**
49-60 Months	1 Order	1,186	635	611	630	1,246	4,308
	2-3 Orders	1,371	830	662	749	869	4,481
	4-6 Orders	685	564	443	447	325	2,464
	7-14 Orders	304	287	316	298	134	1,339
	15+ Orders	53	67	69	60	29	278
49-60 Months Total		**3,599**	**2,383**	**2,101**	**2,184**	**2,603**	**12,870**
Grand Total		**79,059**	**78,860**	**77,014**	**75,315**	**61,860**	**372,108**

Customer Conversion Impact

RECENCY: recent purchase = more likely to convert

FREQUENCY: increased orders = more likely to convert
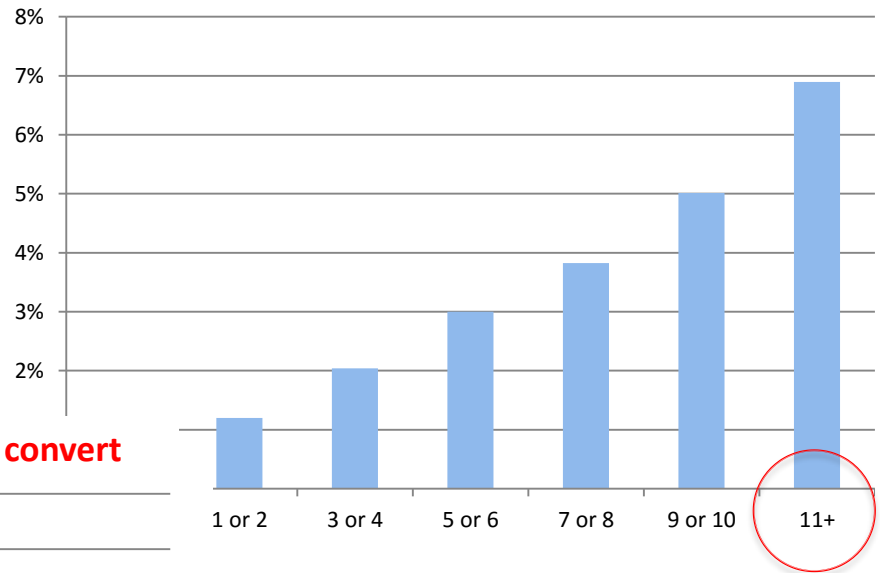
MONETARY: higher spend = more likely to convert

RFM Table Percentages

Count of CustID	Monetary ▾					
Recency ▾	Frequency ▾	Up to $20	$20 - $33	$33 - $47	$47 - $68	Over $68	Grand Total
⊟ 0-12 Months	1 Order	1.62%	1.56%	1.45%	1.53%	2.56%	8.73%
	2-3 Orders	2.44%	1.92%	1.65%	1.85%	1.59%	9.45%
	4-6 Orders	1.57%	1.51%	1.48%	1.51%	0.88%	6.95%
	7-14 Orders	1.31%	1.75%	1.97%	1.90%	0.65%	7.58%
	15+ Orders	0.99%	2.18%	3.14%	2.63%	0.41%	9.35%
0-12 Months Total		7.93%	8.92%	9.68%	9.42%	6.09%	42.05%
⊟ 13-24 months	1 Order	1.37%	1.26%	1.03%	1.18%	2.02%	6.87%
	2-3 Orders	1.93%	1.44%	1.13%	1.28%	1.12%	6.90%
	4-6 Orders	1.09%	0.97%	0.87%	0.87%	0.50%	4.30%
	7-14 Orders	0.75%	0.86%	0.90%	0.81%	0.33%	3.64%
	15+ Orders	0.36%	0.62%	0.77%	0.67%	0.13%	2.55%
13-24 months Total		5.49%	5.16%	4.70%	4.81%	4.10%	24.26%
⊟ 25-36 Months	1 Order	1.21%	1.10%	0.86%	1.03%	1.59%	5.79%
	2-3 Orders	1.74%	1.16%	1.02%	1.13%	0.88%	5.93%
	4-6 Orders	0.97%	0.83%	0.70%	0.66%	0.37%	3.53%
	7-14 Orders	0.61%	0.64%	0.63%	0.55%	0.19%	2.62%
	15+ Orders	0.25%	0.35%	0.41%	0.33%	0.06%	1.40%
25-36 Months Total		4.79%	4.08%	3.61%	3.71%	3.09%	19.27%
⊟ 37-48 Months	1 Order	0.92%	0.48%	0.54%	0.65%	0.93%	3.53%
	2-3 Orders	1.19%	0.72%	0.63%	0.72%	0.71%	3.97%
	4-6 Orders	0.67%	0.52%	0.47%	0.49%	0.32%	2.46%
	7-14 Orders	0.40%	0.36%	0.37%	0.37%	0.15%	1.66%
	15+ Orders	0.12%	0.16%	0.18%	0.18%	0.04%	0.68%
37-48 Months Total		3.31%	2.25%	2.19%	2.40%	2.15%	12.30%
⊟ 49-60 Months	1 Order	0.19%	0.10%	0.09%	0.12%	0.15%	0.65%
	2-3 Orders	0.20%	0.13%	0.11%	0.12%	0.13%	0.69%
	4-6 Orders	0.10%	0.09%	0.07%	0.08%	0.07%	0.41%
	7-14 Orders	0.05%	0.06%	0.07%	0.06%	0.03%	0.28%
	15+ Orders	0.01%	0.02%	0.02%	0.02%	0.01%	0.09%
49-60 Months Total		0.56%	0.41%	0.37%	0.41%	0.38%	2.12%
Grand Total		22.08%	20.81%	20.56%	20.75%	15.80%	100.00%

RFM Table Percentages – Aggregated

Count of CustID		Monetary ▼					
Recency ▼	**Frequency** ▼	**Up to $20**	**$20 - $33**	**$33 - $47**	**$47 - $68**	**Over $68**	**Grand Total**
⊟ 0-12 Months	1 Order	1.62%	1.56%	1.45%	1.53%	2.56%	8.73%
	2-3 Orders	2.44%	1.92%	1.65%	1.85%	1.59%	9.45%
	4-6 Orders	1.57%	1.51%	1.48%	1.51%	0.88%	6.95%
	7-14 Orders	1.31%	1.75%	1.97%	1.90%	0.65%	7.58%
	15+ Orders	0.99%	2.18%	3.14%	2.63%	0.41%	9.35%
0-12 Months Total		**7.93%**	**8.92%**	**9.68%**	**9.42%**	**6.09%**	**42.05%**
⊟ 13-24 months	1 Order	1.37%	1.26%	1.03%	1.18%	2.02%	6.87%
	2-3 Orders	1.93%	1.44%	1.13%	1.28%	1.12%	6.90%
	4-6 Orders	1.09%	0.97%	0.87%	0.87%	0.50%	4.30%
	7-14 Orders	0.75%	0.86%	0.90%	0.81%	0.33%	3.64%
	15+ Orders	0.36%	0.62%	0.77%	0.67%	0.13%	2.55%
13-24 months Total		**5.49%**	**5.16%**	**4.70%**	**4.81%**	**4.10%**	**24.26%**
⊟ 25-36 Months	1 Order	1.21%	1.10%	0.86%	1.03%	1.59%	5.79%
	2-3 Orders	1.74%	1.16%	1.02%	1.13%	0.88%	5.93%
	4-6 Orders	0.97%	0.83%	0.70%	0.66%	0.37%	3.53%
	7-14 Orders	0.61%	0.64%	0.63%	0.55%	0.19%	2.62%
	15+ Orders	0.25%	0.35%	0.41%	0.33%	0.06%	1.40%
25-36 Months Total		**4.79%**	**4.08%**	**3.61%**	**3.71%**	**3.09%**	**19.27%**
⊟ 37-48 Months	1 Order	0.92%	0.48%	0.54%	0.65%	0.93%	3.53%
	2-3 Orders	1.19%	0.72%	0.63%	0.72%	0.71%	3.97%
	4-6 Orders	0.67%	0.52%	0.47%	0.49%	0.32%	2.46%
	7-14 Orders	0.40%	0.36%	0.37%	0.37%	0.15%	1.66%
	15+ Orders	0.12%	0.16%	0.18%	0.18%	0.04%	0.68%
37-48 Months Total		**3.31%**	**2.25%**	**2.19%**	**2.40%**	**2.15%**	**12.30%**
⊟ 49-60 Months	1 Order	0.19%	0.10%	0.09%	0.12%	0.15%	0.65%
	2-3 Orders	0.20%	0.13%	0.11%	0.12%	0.13%	0.69%
	4-6 Orders	0.10%	0.09%	0.07%	0.08%	0.07%	0.41%
	7-14 Orders	0.05%	0.06%	0.07%	0.06%	0.03%	0.28%
	15+ Orders	0.01%	0.02%	0.02%	0.02%	0.01%	0.09%
49-60 Months Total		**0.56%**	**0.41%**	**0.37%**	**0.41%**	**0.38%**	**2.12%**
Grand Total		**22.08%**	**20.81%**	**20.56%**	**20.75%**	**15.80%**	**100.00%**

RFM Segment Aggregation

	Nurture	15.59%
	Grow	13.68%
	Maintain	19.65%
	Recent Inactive	17.39%
	One-off	9.97%
	Lapsed	9.91%
	Severly Lapsed	5.13%
	Other	8.68%

Key findings and observations

RRD was able to create well-defined RFM segments that can be leveraged by a variety of marketing treatments.

- Nurture: recent, low-frequency customers who will migrate to either Grow/Maintain or One-off segments. 15+% of the base.

- Grow: recent, 2+ frequency, but low-value customers.   13+% of the base. Higher-value orders will push them to Maintain.

- Maintain: your best customers! Nearly 20% of the customer base buys frequently, and with high AOVs.

- Recent Inactive: 2+ frequency, but no orders within the past year. Reactivation strategy for 17+% of base.

- One-off: nearly 10% who ordered once, and never again.   Can we get one more purchase from this group?

- Lapsed: another 10%, but no sales in the past 2 years.

RFM Segment Aggregation

Recommended implementation

The RFM segmentation is more valuable if changes over time, such as segment value or customer migration, can be measured.

- Score (segment code) current customer file, then resegment periodically.

- Track changes in segment population. Are key bins increasing/decreasing in size? Does that behavior match our objectives?

- Track customer movement to/from segments. Are the strategies we're employing providing the desired effect; ie., migrating customers to more desirable bins?

- Correlate to departments shopped, product assortment or services enrolled.

- Measure overall impact. Do the programs result in more sales, higher dollar value, less time in between orders?

Thank you!