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SPSS®

Using SPSS Statistics for Marketing Applications

Jarlath Quinn – Analytics Consultant

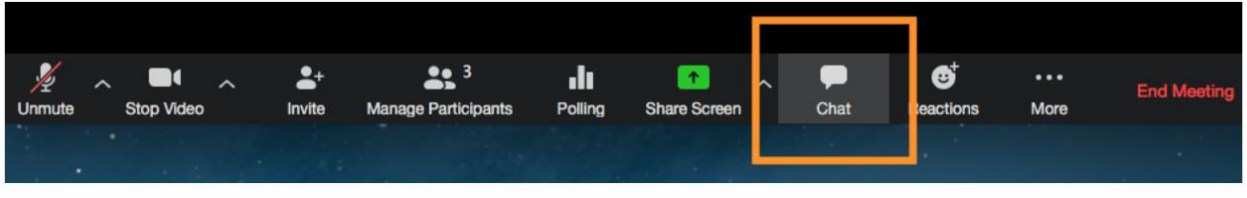
Just waiting for all attendees to join…

Using SPSS Statistics for Marketing Applications

Jarlath Quinn – Analytics Consultant

FAQ's

- Is this session being recorded? Yes
- Can I get a copy of the slides? Yes, we'll email links to download materials after the session has ended.
- Can we arrange a re-run for colleagues? Yes, just ask us.
- How can I ask questions? All lines are muted so please use the chat panel – if we run out of time we will follow up with you.



- Gold accredited partner to IBM, Predictive Solutions and DataRobot specialising in advanced analytics & big data technologies
- Work with open-source technologies (R, Python, Spark etc.)
- Team each has 15 to 30 years of experience working in the advanced and predictive analytics industry

- Deep experience of applied advanced analytics applications across sectors
  - Retail
  - Gaming
  - Utilities
  - Insurance
  - Telecommunications
  - Media
  - FMCG

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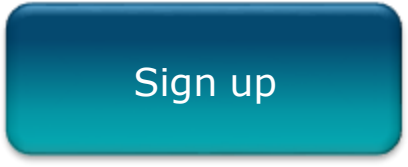
Performing A/B Testing with Significance Tests

A/B Testing

- A/B testing, also known as split testing, is a method used to compare two versions of a webpage, email, app feature, or other content to see which one performs better.
- The process involves randomly showing two different versions (A and B) to different segments of users and measuring their responses based on predefined metrics like click-through rates, conversions, or other user interactions.
- Analysts often have to think about how much data they need to collect in order to see if a change has an effect. This is especially true when dealing with behaviours that only occur a small percentage of the time.
- A/B testing helps businesses make data-driven decisions to optimize their content and improve user experience.

A/B Test - Newsletter Subscription Button



Control

Test

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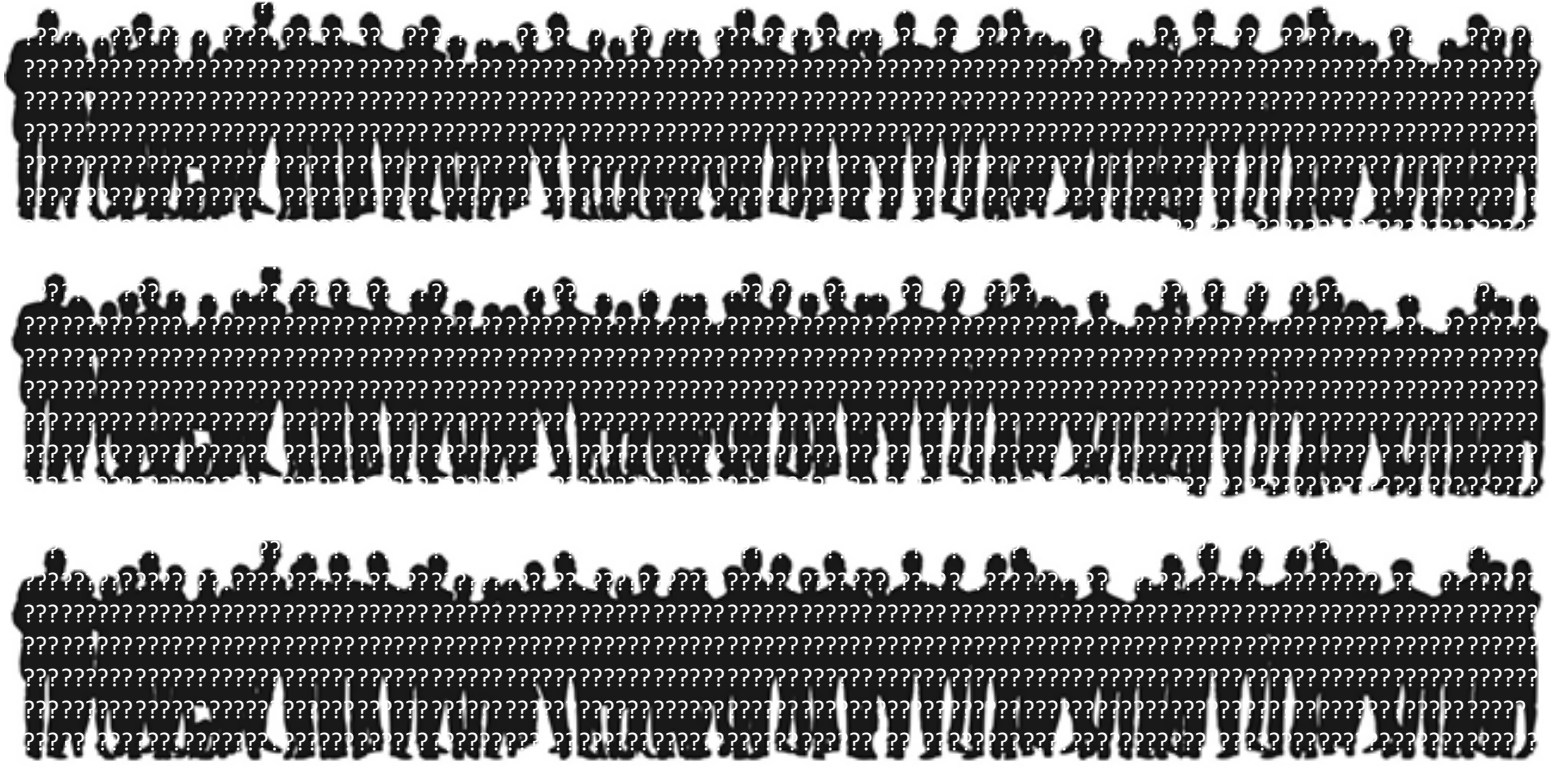
Segmentation & RFM

How are your customers characterised?



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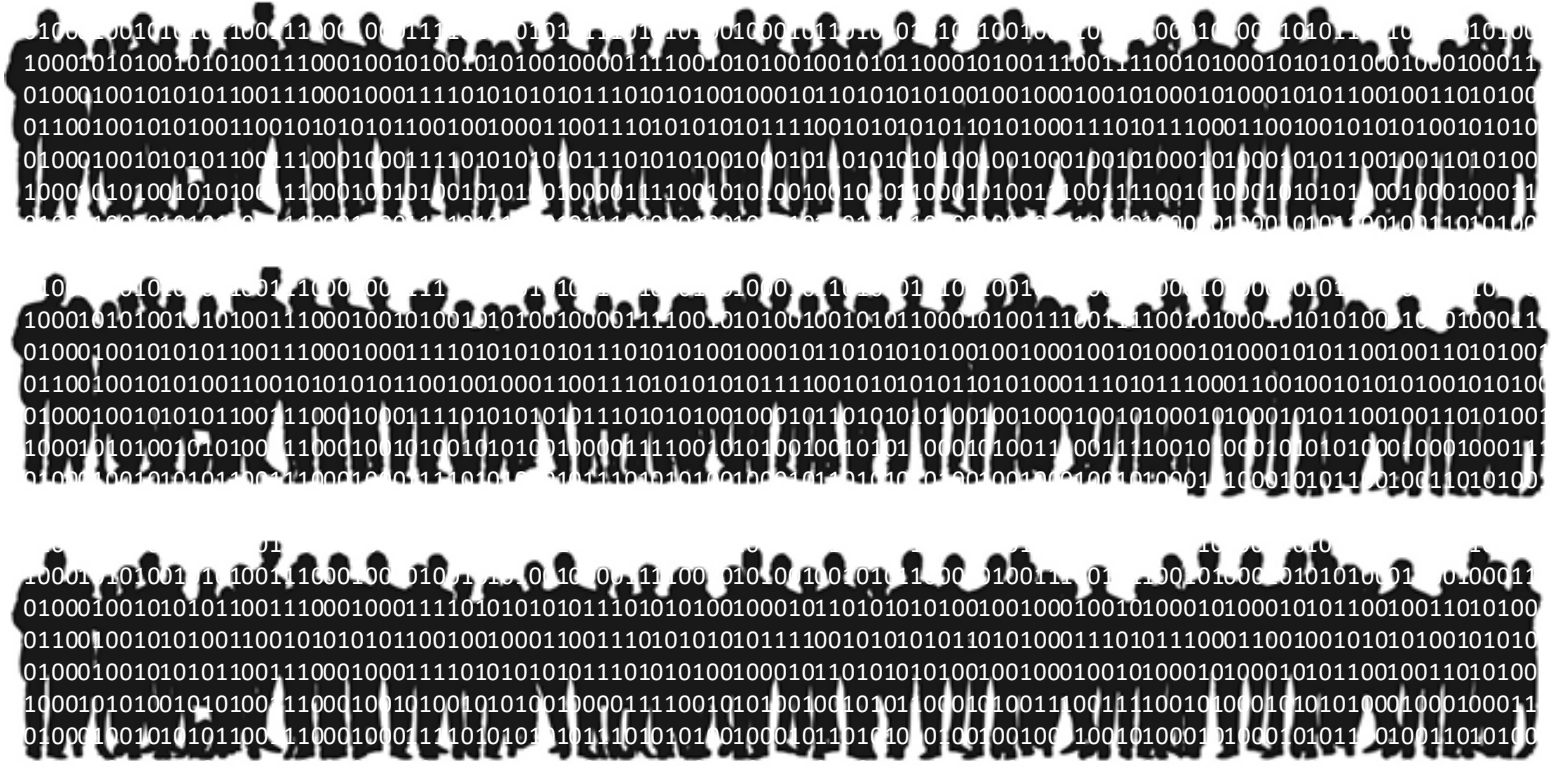
Using data to uncover customer segments



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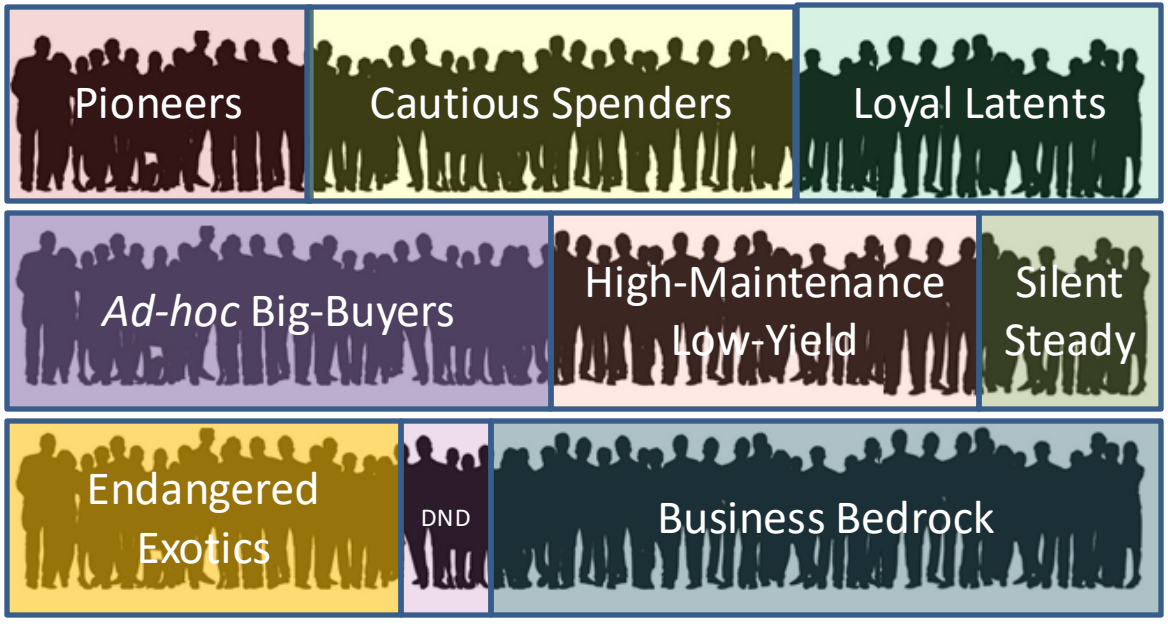
Deeper customer understanding = more appropriate interactions

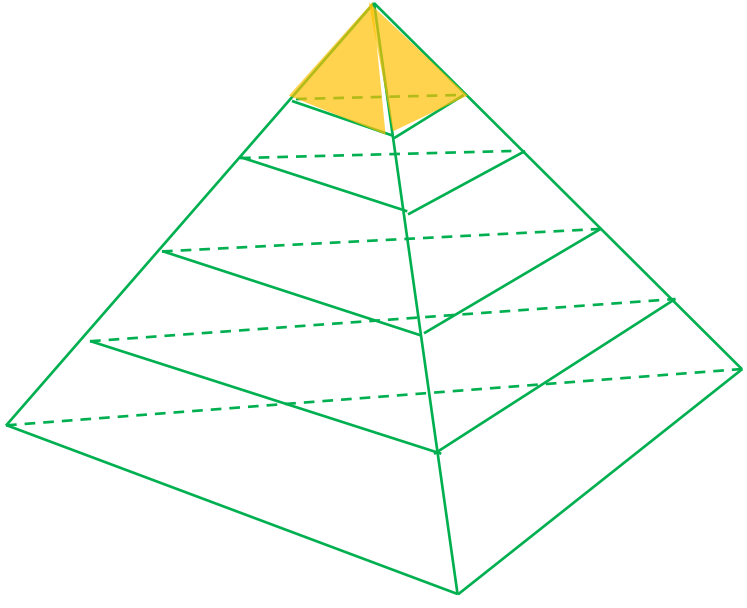


'Unsupervised' techniques like cluster analysis can uncover subtle differences and previously hidden groups

RFM Analysis

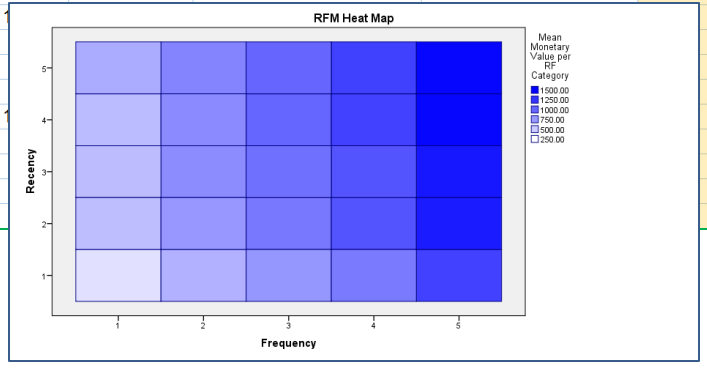
- RFM – Recency, Frequency, Monetary
- 3 Dimensions of loyalty

Recency	Frequency	Monetary
5	5	5
4	5	5
4	4	5
4	4	4
3	4	4
3	3	4
3	3	3
2	3	3
2	2	3
2	2	2
1	2	2
1	1	2
1	1	1



RFM Analysis

	ID	TotalAmount	MostRecent	NumberOfPurchases	PurchaseInterval	Recency_score	Frequency_score	Monetary_score	RFM_score
1	1	1313.00	05/17/2006	10	229.00	2	3	5	235
2	2	1230.00	09/21/2005	11	467.00	1	5	4	154
3	3	1194.00	08/11/2006	13	143.00	3	5	2	352
4	4	794.00	05/24/2006	9	222.00	2	3	2	232
5	5	278.00	03/13/2005	3	659.00	1	1	2	112
6	6	922.00	07/28/2006	9	157.00	3	2	4	324
7	7	961.00	06/20/2006	11	195.00	2	4	2	242
8	8	615.00	06/08/2005	6	572.00	1	2	3	123
9	9	1097.00	05/02/2006	9	244.00	2	3	5	235
10	10	1164.00	05/07/2006	12	239.00	2	4	4	244
11	11	866.00	06/12/2006	12	203.00	2	4	1	241
12	12	950.00	09/25/2006	10	98.00	4	3	2	432
13	13	1562.00	07/28/2006	16	157.00	3	5	4	354
14	14	1083.00	08/19/2006	11	135.00	3	4	3	343
15	15	631.00	11/17/2005	8	410.00	1	3	1	131
16	16	807.00	01/01/2006	9	365.00	1	4	2	142
17	17	1300.00	06/04/2006	13	211.00	2	5	3	253
18	18	921.00	10/11/2005	10	447.00	1	4	3	143
19	19	561.00	07/20/2006	7	165.00	3	1	3	313
20	20	1				4	4	2	442
21	21					2	1	5	215
22	22					1	4	2	142
23	23					1	5	1	151
24	24	1				4	5	1	451
25	25					2	3	1	231
26	26					1	2	1	121
27	27					2	1	3	213
28	28					4	1	2	412



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Predictive Modelling

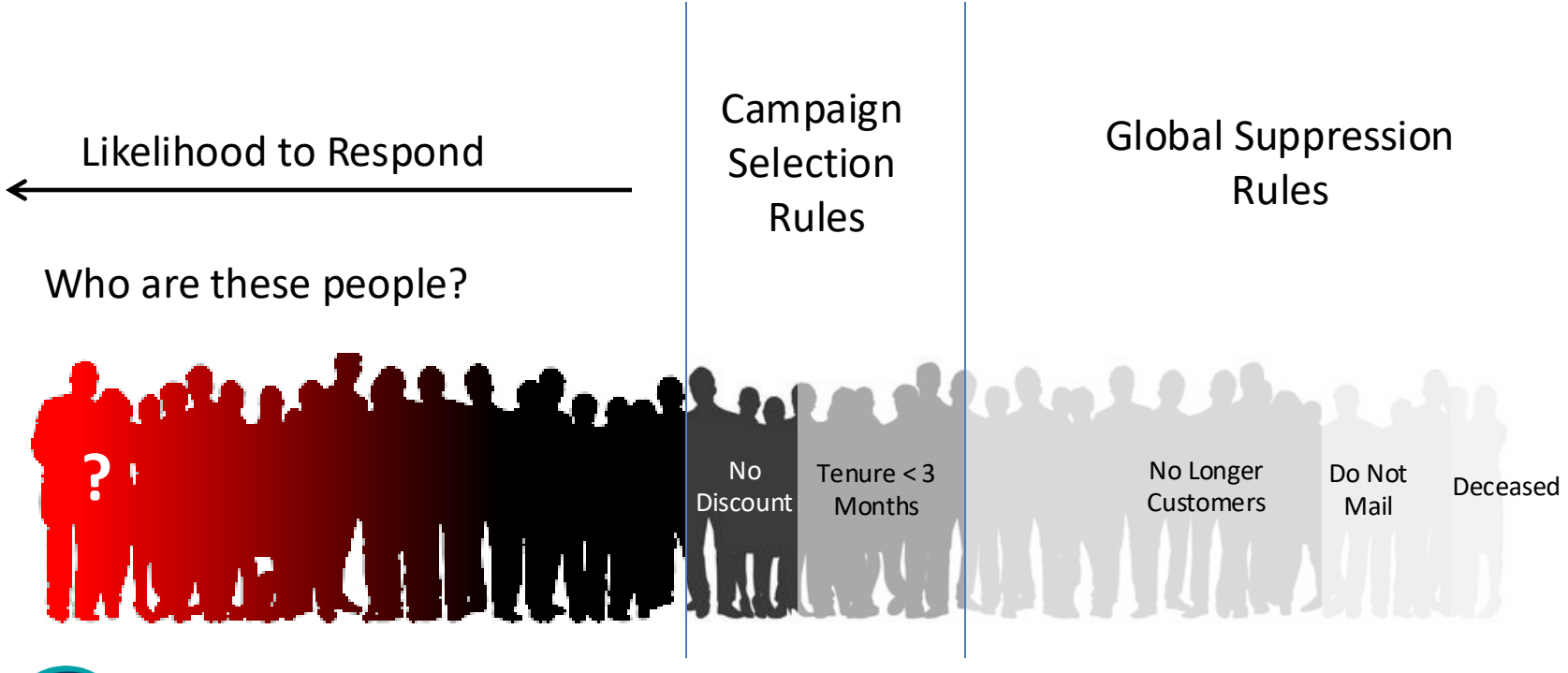
Predictive Modelling Techniques

- Predictive methods can include statistical, machine learning and AI approaches
- The predicted outcome can take the form of numerical values (e.g. revenue, social media likes, visitors, occurrences or time)
- Alternatively, predicted outcomes can take the form of categories (e.g. responded, upgraded, recommended, failed, cancelled or recovered)
- Depending on the business context, analysts may choose accuracy over insight or vice versa. This is because some techniques produce more transparent results than others.
- All these various methods, produce models which generate numerical values in the form of estimates or likelihood scores. These empower the business to make selections based on data-driven predictions.

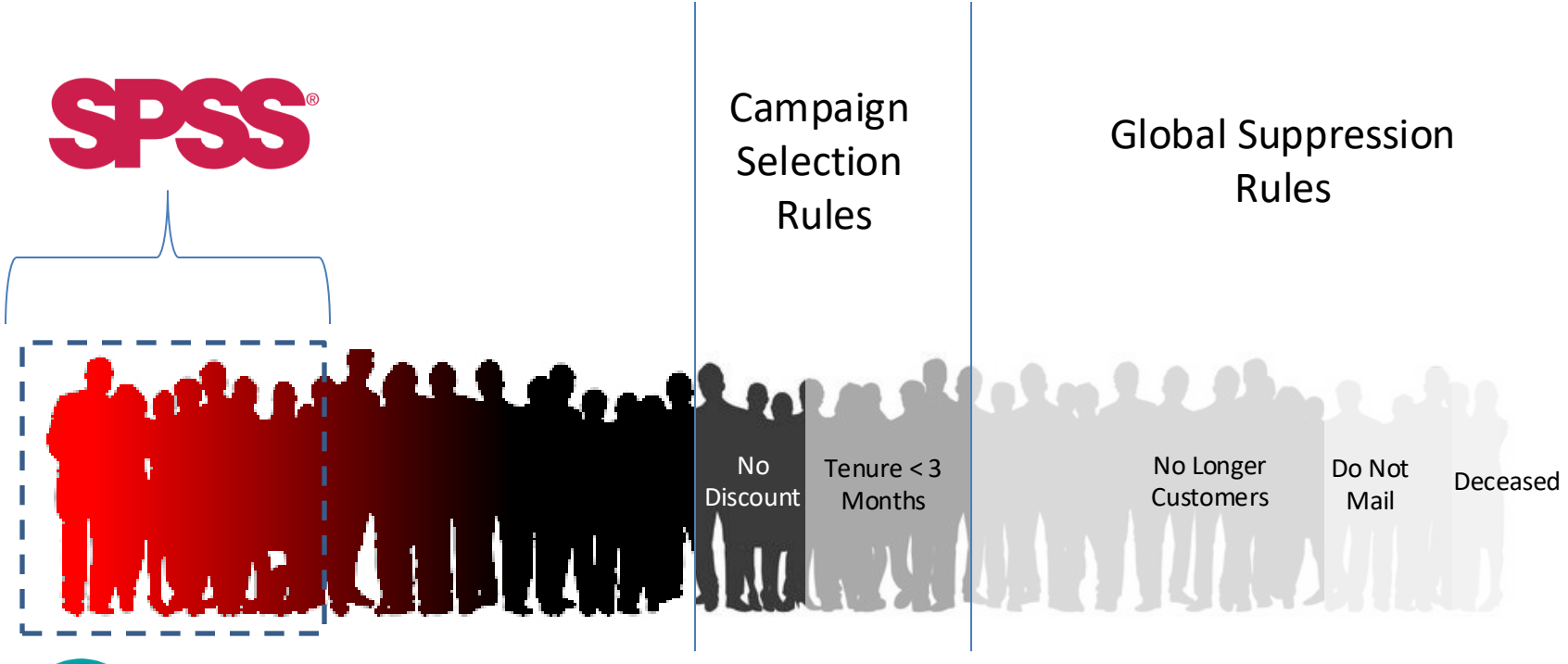
Smart Vision Europe: Examples of Predictive Methods

- Regression Techniques (Predicting numerical *and* category outcomes)
- Neural Networks (Predicting numerical *and* category outcomes)
- Discriminant Analysis (Predicting category outcomes)
- Decision Trees (Creating profiles and predictions)
- Poisson Regression (Predicting occurrences of events)
- Survival Analysis (Elapsed time to a critical event)
- Time Series Analysis (Forecasting demand)

In direct marketing, predictive methods enhance the existing campaign selection process..



By creating a model that identifies the *most likely* responders…



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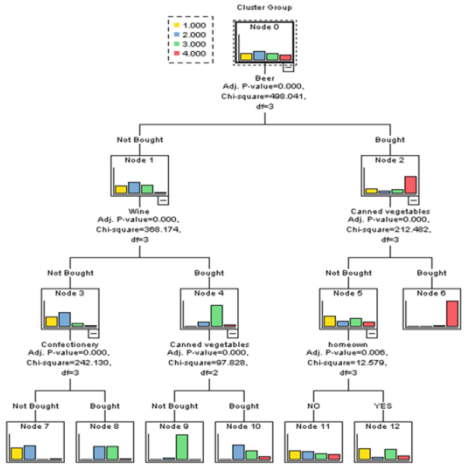


Example Technique: Decision Trees in SPSS Statistics

Where do Decision Trees fit within Predictive Analytics?

- Decision trees are used *extensively and widely* within Predictive Analytics
- Decision trees can be used to
  - Build profiles of customers/employees/clients
  - Find key behavioural segments
  - Generate predictive models
- Decision Trees can be expressed as a series of hierarchical rules which means that they can be converted in languages like SQL for database scoring
- Decision Trees are especially popular because
  - they are fairly visual representations of models
  - relatively easy to understand

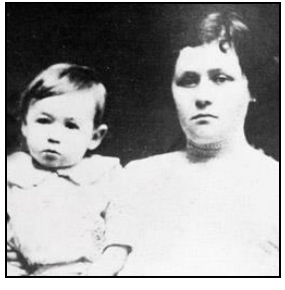
Understanding Decision Trees – a worked example

- What were the most important factors determining survival during the sinking of the RMS Titanic?

Survival on the RMS Titanic

		Count	Percent %
survive	Did not survive	1490	68%
	Survived	711	32%
	Total	2201	100%

Gender?



Age?

Class?

Statistical Tests Like Chi Square help to answer this

Survival on the RMS Titanic

		sex			
		female		male	
		Count	Column Percent %	Count	Column Percent %
survive	Did not survive	126	26.8%	1364	78.8%
	Survived	344	73.2%	367	21.2%
	Total	470	100.0%	1731	100.0%

Pearson Chi-Square Tests

		sex
survive	Chi-square	456.874
	df	1
	Sig.	.000*

Statistical Tests Like Chi Square help to answer this

Survival on the RMS Titanic

		age			
		adult		child	
		Count	Column Percent %	Count	Column Percent %
survive	Did not survive	1438	68.7%	52	47.7%
	Survived	654	31.3%	57	52.3%
	Total	2092	100.0%	109	100.0%

Pearson Chi-Square Tests

		age
survive	Chi-square	20.956
	df	1
	Sig.	.000*

Statistical Tests Like Chi Square help to answer this

Survival on the RMS Titanic

		class							
		1st		2nd		3rd		crew	
		Count	Column Percent %	Count	Column Percent %	Count	Column Percent %	Count	Column Percent %
survive	Did not survive	122	37.5%	167	58.6%	528	74.8%	673	76.0%
	Survived	203	62.5%	118	41.4%	178	25.2%	212	24.0%
	Total	325	100.0%	285	100.0%	706	100.0%	885	100.0%

Pearson Chi-Square Tests

		class
survive	Chi-square	190.401
	df	3
	Sig.	.000*

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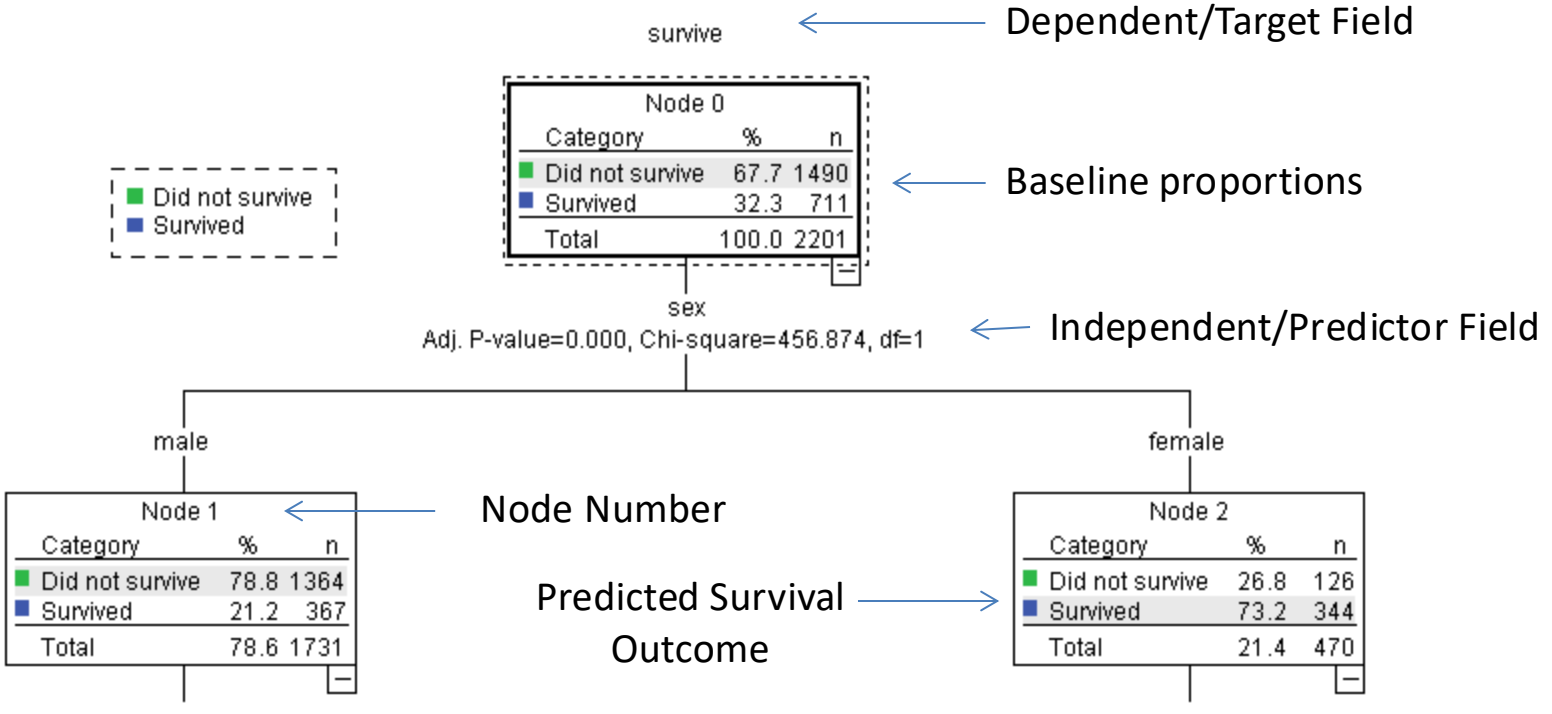
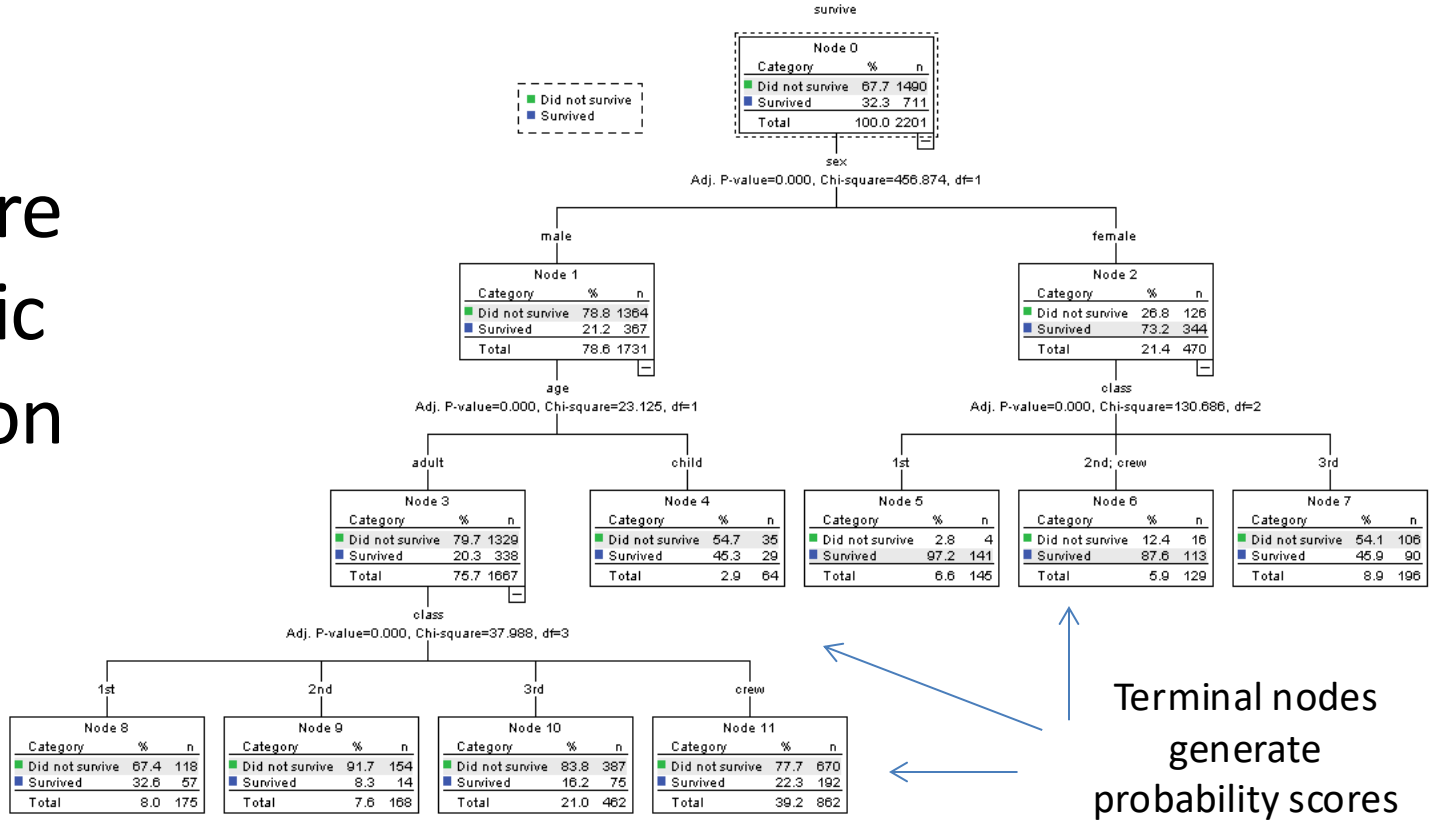
Gender is most important

…and a CHAID Decision tree will reflect this….



Full CHAID Decision Tree

C.H.A.I.D
Chi-Square
Automatic
Interaction
Detector

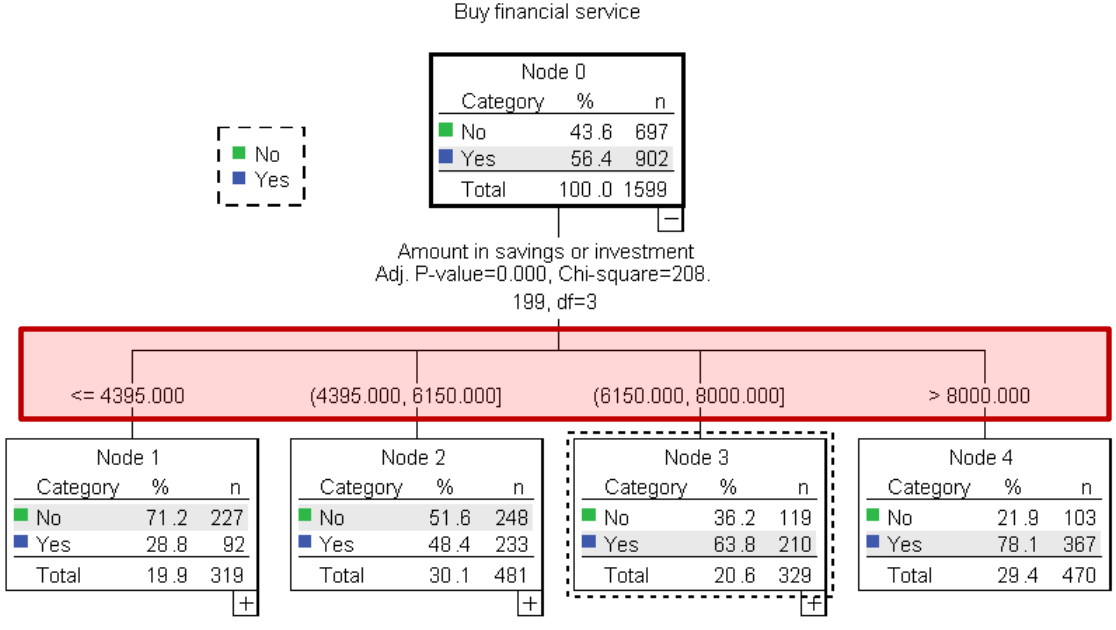


Terminal nodes generate probability scores

Merging/Splitting in CHAID Trees

Decision Trees can merge values of numeric *and* categorical predictors together

This makes the tree more efficient and easier to read



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Let’s take a look…

Working with Smart Vision Europe

- **Consulting Services**

Project Support

Purchase 1-2 days of consultancy time to have an expert work alongside you on your own project

Analytics Advice

Give us 3-5 days to investigate your data & analytical strategy and we'll present our recommendations re: improvements & alternatives

Analytical Deep-Dive

Let us explore your data landscape to test hypotheses, identify problem areas, find key outcome drivers or develop new applications

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Working with Smart Vision Europe Ltd.

- **Sourcing Software**
  - You can buy your analytical software from us often with discounts
  - Assist with selection, pilot, implementation & support of analytical tools
  - http://www.sv-europe.com/buy-spss-online/
- **Training and Consulting Services**
  - Guided consulting & training to develop in house skills
  - Delivery of classroom training courses / side by side training support
  - Identification & recruitment of analytical skills into your organisation
- **Advice and Support**
  - offer 'no strings attached' technical and business advice relating to analytical activities
  - Ticketed technical support services for SPSS product family

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Thank you