Turning Insight into Action

How Aviva Turned Great Models into Great Business Decisions

Rod Moyse, Head of Analytics, Aviva
Chris Yerby, Head of Claims Analytics, Aviva

Session ID 13291

#analyticsx
You have bought your way through the SAS catalogue
And you have all the gear
Data preparation: the invisible but most significant work in delivering analytics
Butt...
Value lies in use
Adoption: the invisible but most significant work in delivering analytical value
We have learned from a series of heroic failures...
...and some award-winning successes
Let’s travel back in time to 2010
The Proof Points

• SAS / Aviva Collaboration
• Demonstrate that there is the opportunity to **deliver value** to the business using advanced analytics and tools
• 3 **Proof Points** (Business Problems) – Complaints, Fraud and Forecasting
• Tangible value which can be unlocked, and these three case studies were the tip of the iceberg
Problem

- Customers who make a complaint are 2½ times more likely to leave us...

The Outcome

- 5k Incremental Lost Policies
- £3.1m costs
- Poor Customer Experience
Objectives

SAS Text Miner analysis of complaints data

• Understand whether a customer is likely to cancel or lapse based on complaint notes

Top ‘root causes’ behind complaints and which events are most likely to trigger a customer leaving?

• Which customers can we influence by giving them additional attention after complaining or just before renewal?
Insight

Using SAS Text Miner we could understand root cause of complaints and impact

Our conventional wisdom was overturned...

Complaint text typically refers to perceived ‘broken promises’, telephony experience and process failure
Outcome & proposed deployment

Piloted an outbound ‘service call’ to target group – checking if problem resolved etc.

Influenced behaviour of ‘target’ group - renewal rates in this group increased from 45% to 85%
Everyone loved it... we must have more of this... this is brilliant

But guess what happened...
Nothing
Be fashionable
Cultivate executive sponsorship... give them something to talk about

Length of drive: a new rating factor!
Work on a problem that really matters to someone important
Partner for success
You play the drums... join a band
1. You play the drums... join a band

- Be fashionable
- Cultivate executive sponsorship... give them something to talk about
- Work on a problem that really matters to someone important
- Partner with an operational sponsor - a sugar daddy with a significant problem
Let’s travel back in time to 2012
The Fraud Problem - Whiplash

30% reduction in Road Traffic Accidents?

62% increase in Injury Claims

£3.4b estimated industry claims fraud problem

£1.3b was detected in 2014 (ABI figures)
Low Hanging Fruit – Network Washing

We used data that the claims handler didn't see to predict the likelihood of fraud

It wasn’t rocket science... John had 4 policies with 11 Claims
John had 5 ‘friends’ connected at **two addresses**
They had an additional 5 policies and 8 Claims
(3 implicated with Noire)
Low Hanging Fruit – Network Washing

Mobile Phone records connected John to 7 Policyholders. By now we have 24 Claims!
Several vehicles had all been involved in multiple claims, but by different individuals.
The same IP Address connected a number of individuals in the fraud ring. 25 Claims and counting....
Low Hanging Fruit – Network Washing

We also cross-referenced e-mail addresses used by our own customers & third parties. In this case a number of policyholders are using the same e-mail address. 27 Claims and 14 policies

Summary

- 27 claims made against 14 Motor Policies
  - £150k of Claims
- 8 claims already investigated and repudiated as part of Fraud Ring Noire (staged / contrived accidents)
  - Others subsequently investigated
- 46 further policies identified that link to mobile phone and address (all off-risk)
  - We found many other cases like this
We developed a Claims Fraud Framework using a variety of techniques to identify fraud. Our Fraud Framework built in SAS was described by IBM as industry leading.

- Network Analysis
- Spatial Analytics
- Text Mining and Watch Lists
- Device Tracking
- Predictive Models and Deterministic Rules
### Claims Fraud Framework

<table>
<thead>
<tr>
<th>Accident Date</th>
<th>Notified Date</th>
<th>Total Indicators</th>
<th>Predictive Model Score</th>
<th>Highest AFI Score</th>
<th>Distance from Key Attractors</th>
<th>Presence of Fraud Location Keyword</th>
<th>Presence of Fraud Action Keyword</th>
<th>Short Term Policy</th>
<th>Late at Night</th>
<th>High Risk Occ</th>
<th>High Vehicle Occupancy (Merlin)</th>
<th>Number of Third Parties (Identified)</th>
<th>No Claim Offered</th>
<th>Delay</th>
<th>Speed &lt;5</th>
<th>PFI Indicator</th>
<th>PFI No Concerns</th>
<th>PFI Age under 25</th>
<th>Claim within 1 month of Inception</th>
<th>Current Estimate</th>
<th>P&amp;I Armo unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>13-Dec-12</td>
<td>18-Dec-12</td>
<td>0</td>
<td>2</td>
<td>42</td>
<td>Within 10 km</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>4</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>$15,042</td>
<td>$15,042</td>
<td>$15,042</td>
</tr>
<tr>
<td>25-Aug-12</td>
<td>25-Aug-12</td>
<td>1</td>
<td>2</td>
<td>49</td>
<td>Within 20 km</td>
<td>1</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>4</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>$27,195</td>
<td>$27,195</td>
<td>$27,195</td>
</tr>
<tr>
<td>21-Jan-13</td>
<td>21-Jan-13</td>
<td>0</td>
<td>-</td>
<td>25</td>
<td>Over 10 km</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>4</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>$7,500</td>
<td>$7,500</td>
<td>$7,500</td>
</tr>
<tr>
<td>12-Dec-13</td>
<td>18-Dec-13</td>
<td>1</td>
<td>3</td>
<td>31</td>
<td>Over 10 km</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>4</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>$11,155</td>
<td>$11,155</td>
<td>$11,155</td>
</tr>
<tr>
<td>04-Oct-13</td>
<td>08-Oct-13</td>
<td>0</td>
<td>2</td>
<td>47</td>
<td>Within 10 km</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>4</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>$28,500</td>
<td>$28,500</td>
<td>$28,500</td>
</tr>
<tr>
<td>15-Dec-12</td>
<td>26-Dec-12</td>
<td>0</td>
<td>2</td>
<td>46</td>
<td>Within 10 km</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>4</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>$30,425</td>
<td>$30,425</td>
<td>$30,425</td>
</tr>
<tr>
<td>30-Aug-11</td>
<td>13-Sep-11</td>
<td>2</td>
<td>2</td>
<td>15</td>
<td>Within 10 km</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>4</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>$13,115</td>
<td>$13,115</td>
<td>$13,115</td>
</tr>
<tr>
<td>21-Jan-13</td>
<td>23-Jan-13</td>
<td>0</td>
<td>2</td>
<td>23</td>
<td>Over 10 km</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>4</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>$3,510</td>
<td>$3,510</td>
<td>$3,510</td>
</tr>
<tr>
<td>26-May-12</td>
<td>28-May-12</td>
<td>0</td>
<td>1</td>
<td>46</td>
<td>Within 0.0 km</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>4</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>$15,530</td>
<td>$15,530</td>
<td>$15,530</td>
</tr>
<tr>
<td>23-Nov-11</td>
<td>19-Nov-11</td>
<td>1</td>
<td>2</td>
<td>46</td>
<td>Within 0.0 km</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>4</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>$15,590</td>
<td>$15,590</td>
<td>$15,590</td>
</tr>
<tr>
<td>12-Dec-11</td>
<td>19-Dec-11</td>
<td>2</td>
<td>2</td>
<td>46</td>
<td>Within 10 km</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>4</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>$33,856</td>
<td>$33,856</td>
<td>$33,856</td>
</tr>
<tr>
<td>26-Aug-12</td>
<td>19-Aug-12</td>
<td>0</td>
<td>3</td>
<td>33</td>
<td>Over 10 km</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>4</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>$4,800</td>
<td>$4,800</td>
<td>$4,800</td>
</tr>
<tr>
<td>07-Oct-12</td>
<td>08-Oct-12</td>
<td>2</td>
<td>4</td>
<td>45</td>
<td>Within 10 km</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>4</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>$10,140</td>
<td>$10,140</td>
<td>$10,140</td>
</tr>
<tr>
<td>17-Dec-11</td>
<td>22-Dec-11</td>
<td>0</td>
<td>3</td>
<td>9</td>
<td>Over 10 km</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>4</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>$3,990</td>
<td>$3,990</td>
<td>$3,990</td>
</tr>
<tr>
<td>05-Jan-12</td>
<td>07-Jan-12</td>
<td>2</td>
<td>2</td>
<td>8</td>
<td>Over 10 km</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>4</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>$13,000</td>
<td>$13,000</td>
<td>$13,000</td>
</tr>
<tr>
<td>15-Nov-12</td>
<td>19-Nov-12</td>
<td>0</td>
<td>2</td>
<td>26</td>
<td>Within 10 km</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>4</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>$11,400</td>
<td>$11,400</td>
<td>$11,400</td>
</tr>
<tr>
<td>19-Sep-12</td>
<td>09-Sep-12</td>
<td>0</td>
<td>2</td>
<td>46</td>
<td>Within 10 km</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>4</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>$6,455</td>
<td>$6,455</td>
<td>$6,455</td>
</tr>
<tr>
<td>29-Oct-12</td>
<td>31-Oct-12</td>
<td>1</td>
<td>3</td>
<td>31</td>
<td>Over 10 km</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>4</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>$6,085</td>
<td>$6,085</td>
<td>$6,085</td>
</tr>
<tr>
<td>27-Oct-12</td>
<td>30-Oct-12</td>
<td>2</td>
<td>1</td>
<td>46</td>
<td>Within 10 km</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>4</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>$21,120</td>
<td>$21,120</td>
<td>$21,120</td>
</tr>
<tr>
<td>10-Dec-12</td>
<td>11-Dec-12</td>
<td>0</td>
<td>3</td>
<td>41</td>
<td>Within 10 km</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>4</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>$5,500</td>
<td>$5,500</td>
<td>$5,500</td>
</tr>
</tbody>
</table>

But our delivery mechanism was not as sophisticated.....
This is brilliant

But guess what happened...
Nothing
Only players win matches... however passionate the commentary
Blow the whistle!
Get on the field of play
Deliver a product that uses your insight
But products are expensive so build a beta
Grow a beard... drink flat whites
2. Grow a beard... drink flat whites

- Only players win matches (however passionate the commentary)
- Get on the field of play
- Deliver a product that uses your insight
- Products are expensive so build a beta version and get it out there
Let’s travel back in time to 2013
The Birth of Claims Analytics

We didn’t believe fraud was the only problem that could be solved in claims. We focussed on whiplash claims where we spent £750m annually...

Variation in Settlement Cost was large and appeared to be largely driven by inconsistent process.
The Birth of Claims Analytics

Proposition (to claims analytics)

• A web based tool accessible by all claims handlers delivering a **Fraud Assessment** and **Settlement Valuation** Figure using Predictive Models

Outcome

• £150k investment and 90 Days to
• Develop Models, **Build App**, and **Pilot** in the operation
The Birth of Claims Analytics

We built a dashboard to deliver our **Fraud** insight to 250 Claims Handlers it has made a massive difference to adoption.
The Birth of Claims Analytics

The Dashboard also recommends our ‘best offer’ for settling the Whiplash Claim and finds appropriated Case Law.
This is brilliant

But guess what happened...
A mixed reception
Make sure your user and product goals are aligned
Set your users free... automate the run of the mill, no one wants to do what the machine tells them
Make your users awesome

Give them a super power
3. Make Your Users Awesome

- Make sure your user goals and your product goals are aligned
- Set your users free... automate the run of the mill, no one wants to do what the machine tells them
- Give your users a super power
Let’s travel back in time to 2015
This is an example of one of our finest collaborations with Claims
Our Claims handlers

>100,000
The Business Problem

25% are uneconomical to repair...

...but we used to send 60% of these to the garage anyway
The Business Problem

Because of this it takes on average 28 days to settle a total loss...
The Business Problem

And sometimes we get it wrong!

vehicles should be repaired...
...but we write them off
The Outcome

- **Additional Costs**  
  for **Aviva**

- **Delays in Settlement**  
  for **the Customer**

- **Waste**  
  for **the Repairer**
BUT Identifying a total loss is hard!
A test for you
2008 Ford Fiesta, 77683 miles

Customer was hit from behind by third party vehicle while braking
2007 Seat Ibiza, 37000 miles

Council bin-wagon scrapped
policyholders parked car
Rear end collision required many new parts and caused hidden structural damage.

Damage cosmetic and vehicle has low-mileage.
‘There are three ingredients we need to know to make the decision’

What was the vehicle worth before the accident (PAV)?

A estimate, at FNOL, of how much it is likely to cost to repair

The Salvage Value or a ‘repair up to %’
Our solution

30 seconds

Customer calls Aviva after accident

SAS Real-Time Decision Manager collects key information from claims system in real-time

Predictive models calculate estimated repair cost in real-time

Web call establishes pre-asset vehicle valuation

Handler delivered ‘next best action’ – repair or write off?

Web call to Auto Trader identifies settlement valuation
The benefits

**Aviva:** 85% of Total Losses identified on day 1

**Customers:** Lifecycle for customer reduced to 12 day

**Handlers:** A complex job made simpler (94% adherence to tool decision)
This is brilliant

But guess what happened...
Award-winning success!
An unusual superpower: claims estimation
Stun your customers
The best glory is reflected
Be a money making machine
4. Score a hat trick

- The best glory is reflected
- Be a money making machine
- Stun your customers
The checklist for success

1. You play the drums... join a band
2. Grow a beard... drink flat whites
3. Make your users awesome
4. Score a hat trick