Session 4a – Future of Data Analytics in Auto insurance

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Future of Data Analytics in Auto insurance

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29 August 2016

Future of Data Analytics in Auto insurance

- Background of Data Analytics in Auto insurance
- Benefits to Insurers
- Implementations of Data Analytics in Auto Insurance
- Case analysis
Background of Data Analytics in Auto insurance

True risk of the insured

Traditional insurance

<table>
<thead>
<tr>
<th>Car</th>
<th>Make and model of the car</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Condition of the car</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>When the car is driven</th>
</tr>
</thead>
<tbody>
<tr>
<td>Day or night</td>
</tr>
<tr>
<td>Weather conditions</td>
</tr>
<tr>
<td>Seasonal use only</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Driver</th>
<th>Experience of the driver</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>How the car is driven</th>
</tr>
</thead>
<tbody>
<tr>
<td>General adherence to laws &amp; regulation</td>
</tr>
<tr>
<td>Length of journeys</td>
</tr>
<tr>
<td>Acceleration and speed of car on different road types / traffic density</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Where the car is driven</th>
</tr>
</thead>
<tbody>
<tr>
<td>Traffic density</td>
</tr>
<tr>
<td>Type of road</td>
</tr>
<tr>
<td>Traffic enforcement (e.g. Speed cameras)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Car factors</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age of the car</td>
</tr>
<tr>
<td>Make and model of the car</td>
</tr>
<tr>
<td>Value of the car</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Driver factors</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age of the driver</td>
</tr>
<tr>
<td>Claims history</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Other</th>
</tr>
</thead>
<tbody>
<tr>
<td>Socio demographic</td>
</tr>
<tr>
<td>Geographic</td>
</tr>
</tbody>
</table>

Use the following as proxy of the true risk:

— Devices can be installed by the insurer, self-installed
— Or it come pre-installed by car manufacturers
— New developments in smartphone apps can measure driving behaviour without the need for an onboard device
— Data can be recorded and reported by the insured themselves or collected
— Increasingly, devices automatically transmit data via satellite and GPS

Premium Pricing schemes

- Pay-As-You-Drive
- Pay-How-You-Drive
- Peak/off-peak hours, monthly billing, highways/urban roads
Applications of Telematics to Auto Insurance

Accident and Claims Management
- Customer service
- Emergency response
- Accident management
- Claims validation
- Fraud Management
- Claims Management

Pay How You Drive (PYHD)
- Pay less or more based on:
  - Driving style
  - When you drive (day, night, rush-hour)
  - Where you drive (city, motorway, rural)
  - Restricted cover (young people cannot drive after midnight or 10pm at weekends until 5am)

Pay As You Drive (PAYD)
- Customers pay on how far he drives, pay as you go monthly or even daily, or annual adjustments on renewal

Pricing
- Better pricing and product design
- Customer segmentation
  (product & service management)

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# Reduced accident rates, lower average cost per claim, better profitability

## Allianz
- 15% improvements in combined ratio
- 43% improvement in lapse ratio
- 83% improvement in cross-selling ratio

*Telematics-introducing pay per use*

Allianz SE, Milan, 18 Jul 2012

## Zurich
- The trial group with the telematics systems installed saw a 66.4% reduction in their annualized accident rate for own damage claims and a 59.0% reduction in the cost per vehicle for these claims, 72.2% reduction in the annualized accident rate for ‘third party’ claims, and 83.1% reduction in the cost per vehicle for these claims.

*Online interview with Andy Price, practice leader, motor fleet at Zurich Risk Engineering*

## Ageas
- 15% improvements in combined ratio
- 43% improvement in lapse ratio
- 83% improvement in cross-selling ratio

*Telematics statistics*

- A 20% drop in crashes involving young drivers.
- In general, telematics users have fewer serious accidents.
- Average claims from drivers using telematics can be 30% lower.

*Ageas Business report 2012*

## High risk, young drivers – significantly fewer accidents

"20% drop in car accidents thanks to Telematic Insurance"
- Average cost of a claim is 30% lower

*news release, Co-operative Banking Group 12 April 2012, an analysis of 10,000 young driver claims*

When we trialled it (telematics system) with 1,500 young drivers, limiting night-time driving, car accidents in this group fell by 20% and premiums by approx 30%.

*Aviva CSR report 2007*

A third of customers aged 18-23 are saving at least 40% on their premiums and, more importantly, accidents have been reduced because the scheme encourages young drivers to stay off the roads at high-risk periods, such as at night. Claims by young drivers have fallen by over 30%.

*Aviva CSR report 2007*
Telematics offer significant first mover advantages

Benefits summary (1/2)

1. Better data and insurance management
   - Provide accurate driving information, facilitating accurate evaluation of the risk exposure from the driver and better pricing – reject/accept, specific loadings, premium bands
   - Claims – a faster and more informative claims process, including crash analysis, objective and timely information for claim officers
   - Control over risks – driving time/location restrictions give the insurer control to manage risks

2. Behavioural improvements
   - Cost conscious policyholders drive less – lower chance of accidents
   - On-board monitoring/feedback improves driving leading to behaviour change
   - Short-term Hawthorne effect of better driving as “I’m being watched”
Benefits summary (2/2)

3 Increased quality and volume
- An insurance policy designed and marketed to reward and lower premiums for better drivers will attract drivers of higher quality with lower accident rates
- Telematics insurance is becoming more and more popular with drivers, seeing it as a fairer approach to car insurance, especially with younger drivers and increasing pricing in the market

4 Increased opportunities
- Increased cross-selling opportunities, more interaction with policyholders
- Increased retention rates from better pricing and renewal adjustments
- Early movers are able to benefit most from the improvements in loss ratios with lower competition pressures
- The high quality drivers will most likely move first to take up telematic motor insurance, increasing the risk of adverse selection for the rest of the market

Future of Data Analytics in Auto insurance

Key messages for today
- Background of Data Analytics in Auto insurance
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Implementations of Telematics Auto Insurance

Norwich Union
- For drivers between the age of **22-65**,
  - during non-rush hours, highway starts from £0.01 per mile
  - urban roads starts from £0.04 per mile.
- For young drivers between the age of **18-23**,
  - during accident-prone hours (11pm – 6am) £1.00 per mile,
  - during non-rush hours, £0.05 per mile.

Progressive
- Snapshot is now widely used in 38 states in America. Information such as speed, time, and mileage are transmitted to insurers through Telematics. Because GPS is not used, this avoids violating the location privacy of customers.

Real Insurance
- PAYD (Real Insurance) – The Australian PAYD is not dependent on GPS data; instead, customers have to report the mileage by themselves and prepay the premium. Customers have to provide their initial mileage data, and insurers will reconcile the data to make sure they have paid enough for their mileage when claiming happens (or when they are required to report).

Aryeh
- In Israel model, mileage information is stored in a small vehicular radio device, and the information will be collected by gas station when refueling.

Liberty Mutual
- Onboard Advisor is a kind of insurance product priced according to vehicle usage. Given the drivers' degree of safetyness within the fleet, the discount could be as high as 40%. In order to have a higher value added, this product is sold bundled with other products, a wide variety of tools helping improve the safetyness, lower fuel consumption and operating cost, have been provided. For example, Performance Advisor from Sensomatix (insurance and safety examine part), Mobile Advisor from GE (fleet monitor part), Fuel Advisor from Voyager/US Bank (Fuel card), etc.

Eco-system of the connected car
Effective delivery of connectivity-based services will require seamless integration of infrastructure by various stakeholders

Telematics Services

Vehicle-independent
- On-demand infotainment
  - Music, news, stocks, sports
  - Audio/Video
  - Apps store
  - Multimedia, internet, social
- Navigation
  - Navigation
  - Travel info
  - Route optimization
- Safety and security
  - Roadside assistance
  - Emergency notification
  - Theft tracking
  - Remote control

Vehicle-centric
- Diagnostics
  - Vehicle health
  - Maintenance
  - Recalls
- Vehicle-to-vehicle
  - Traffic
  - Driver warnings
  - Pre-emptive crash info
  - Threat and hazard sensing
- Other
  - Usage-based Insurance (UBI)
  - Fleet management
  - Payment (parking, toll)

Delivery
- Service delivery infrastructure
- User interface
- Wireless network (connectivity)
- Customer support
What does UBI mean for Customers and Insurers?

**Opportunities**

- **Better products**
  - Holistic protection
  - Customized products
  - More competitive offerings

- **Better pricing**
  - Reward good drivers
  - Drive less, pay less
  - Better reflect the true risk
  - Reduce cross-subsidisation
  - Promote better driver behavior

- **Reduce claim costs**
  - Speed up FNOL/claim handling
  - Reduce fraudulent claims
  - Reduce theft losses

**Challenges**

- **Distribution**
  - Partner with carmakers, roadside assistance, etc.
  - Increase in the number of customer touch points
  - Direct interaction with customers, increasing X-sell

- **Product development**
  - Customised products to meet customer needs
  - Ancillary services to increase revenue and to improve overall customer experience
  - Higher customer expectation to provide better products and pricing

- **Operations**
  - Data is bigger in volume, variety, and velocity
  - IT system to manage and leverage telematics data
  - Thorough understanding of risks, customer behaviour and needs

Build insurance into the cost of the car and challenge the insurance industry

Manufacturers are obviously developing different business models to allow them to include financing with their vehicles. However, this still feels distinct from the vehicle and is provided by another part of the organization. Whole-of-life car ownership models are developing and will continue to do so, as Telematics and insurance become more coupled. Another likely route is manufacturers offering monthly payment plans that will include insurance and variability based on driving practices.
Implementations of Data Analytics in Auto Insurance

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Key messages for today

TESLA MODEL S burned into ground in France

ON August 5th, 2016, a Tesla Model S was making huge noise and dashboard signaled warning message about battery charging malfunction. 3 passengers fled the vehicle and the car was soon on uncontrollable fire. No one was hurt in the accident and Tesla is still investigating the problem.

Talking point: In the case, the fault is very obvious on Tesla. However, what is the boundary between product liability and auto liability? If the too smart vehicle distracted the drivers, whose fault is it?
First Death Event in TESLA MODEL S

On May 7th, 2016, a Tesla Model S made an impact with a left-turning truck while on autopilot. The truck driver later said the Model S was driving at very fast speed as if it never seen the truck. It was found that the Tesla’s driver was watching a DVD in the car.

Talking point: In the case, Tesla insists that the Model S’s autopilot was designed and instructed to users as a supporting tool to help the driver NOT replacing the driver. However, with the capability and marketing on self-driving, it could be very misleading to the driver that it could automatically drive. We are still waiting on final verdict…

GOOGLE Admits Fault in Driverless Car

On February 14th, 2016, a Google Lexis Driverless Car hit a bus while attempting a right turn. The right turn lane was partially obstructed and Google car assumed the outer lane bus would slow and wait for Google to maneuver around the obstacle and drove into the bus.

Talking point: Previously, Google driverless car was passively involved in a few accidents before and it’s the fist time GOOGLE car actively drove into other vehicle. Product Liability price would subsequently change based on these events.
Conclusion

1. Actuaries need to pay more attention to new technology innovation in order to remain competitive.

2. Big Data theory indicates that every driver has its own unique riskiness and cost of insurance.

3. Pricing actuaries need to learn more on large data analysis to be able to price each individual drivers and driver/car combinations.

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Questions?

THANK YOU