

Usage-Based Insurance: Setting Realistic Goals and Expectations in Data, Modeling, and Implementation

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Usage Based Insurance: Setting Realistic Goals and Expectations in Data, Modeling and Implementation

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Table of Contents

Introduction	4
Getting Started	10
Telematics Devices and Data	16
Pilots	18
Building Models	22
Product Evolution	25

Usage-Based Insurance

The Dilemma:

Usage-based insurance represents the next big thing in auto insurance with a potential to provide the types of detailed customer and risk insights that insurers have always dreamed of.

However, usage-based insurance must be understood in terms of a broader internalization of a new paradigm and commitment to advanced analytics and data-driven decision making processes.

Getting Acquainted with Usage-Based Insurance

Characterizing Insurance Telematics

- Data collection channel must be created
- No standards for data
- Poly-structured data
- Data volumes much larger (big data)
- Many more variables involved
- Raw data; much interpretation needed to make actionable for insurance use

Getting Acquainted with Usage-Based Insurance

Characterizing Insurance Telematics Cont.

- Increased data storage capacity (petabyte)
- Continuous draw of data needed for ongoing risk segmentation and pricing
- Real-time data collection (actual performance)
- (near) real-time analysis (FMECA)
- Traditional statistical analysis/modeling tools and methods may not be sufficient

Getting Acquainted with Usage-Based Insurance

Time	Latitude	Longitude	Elevation	Speed (MPH)	Heading (Degrees from true North)	Event Code	Odometer	Gas
2012-02-16T02:26:23	42.68	-82.20	167.02	0	0	IGNITION_OFF_TIME	69553	14.7
2012-02-16T01:26:24	42.68	-82.20	153.10	1	189	IGNITION_OFF	69553	14.7
2012-02-16T01:25:55	42.68	-82.20	156.51	45	270	IGNITION_ON_TIME	69552	14.7
2012-02-16T01:24:54	42.68	-82.19	154.49	30	302	IGNITION_ON_TIME	69552	14.9
2012-02-16T01:23:53	42.68	-82.19	159.44	0	283	IGNITION_ON_TIME	69552	14.9
2012-02-16T01:22:52	42.68	-82.19	146.44	51	0	IGNITION_ON_TIME	69552	15.0

...1440 records for a 24 minute trip...

2012-02-16T01:07:15	42.66	-82.10	166.54	73	284	SPEEDING	69535	15.4
2012-02-16T01:06:20	42.65	-81.98	153.66	63	289	IGNITION_ON_TIME	69534	15.4
2012-02-16T01:05:19	42.65	-81.95	165.18	54	237	IGNITION_ON_TIME	69533	15.5
2012-02-16T01:04:18	42.66	-81.93	189.80	47	160	IGNITION_ON_TIME	69532	15.5
2012-02-16T01:03:18	42.67	-81.92	215.10	22	208	IGNITION_ON_TIME	69532	15.5
2012-02-16T01:03:18	42.67	-81.91	215.10	22	208	DIRECTION_CHANGE	69532	15.5
2012-02-16T01:02:15	42.67	-81.90	254.38	0	0	IGNITION_ON	69532	15.6
2012-02-16T00:40:12	42.67	-81.89	254.38	0	0	IGNITION_OFF_TIME	69532	15.6

...1440 X 10k bytes = 14.4MB for the 24 minute trip (1 vehicle)...

Usage-Based Insurance Challenges

Hurdles for Insurers

- Lack of prior experience with telematics data
- Insufficient analytics capability
- Population size
- Litigation and privacy risks
- Developing adequate business case
- Internal competition for other priorities

Competitive Factors

Business Pressures

- Pressure to 'catch up' to competitors
- Threat of predation / adverse selection
- Hard market or not?
- Diminishing ROE
- Profitable growth imperative

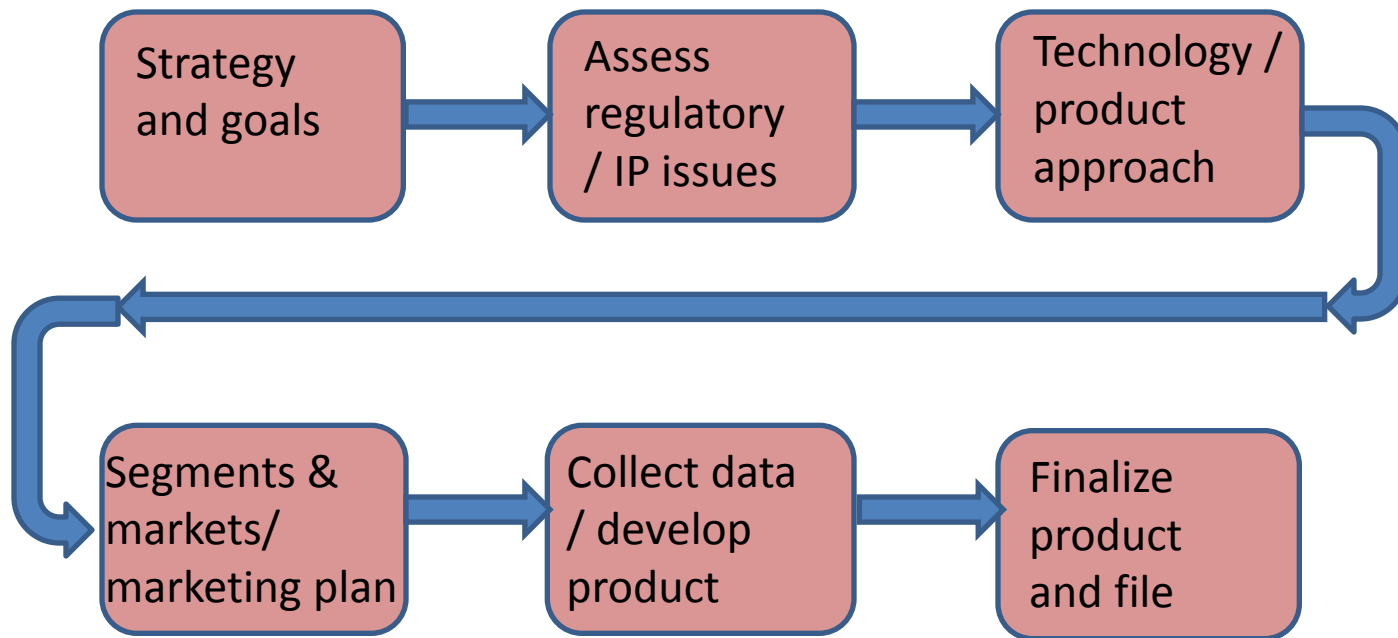
Getting Started

Start with Strategy

General process for the creation of insurance telematics products

- Define strategy and goals
- Assess regulatory and IP issues
- Choose product approach and technology
- Choose target market and create marketing plan
- Collect data, analyze, and develop product features
- Finalize product, file, and rollout

General process for the creation of insurance telematics products



Getting Started

- **Strategic Intent – What is it that you are trying to do?**
 - Fear of predation/adverse selection
 - Attraction of new, profitable customers
 - Increased market share
 - Enhanced risk segmentation capability
 - Innovation
 - Value proposition for customer
- **Time to Market**
 - Early adopter, early majority
 - ‘Me too’ player, fast follower
 - Signs of adverse selection



Getting Started

- **Capability Assessment**

- Actuarial / analytics capability
- IT infrastructure
- Statistical and modeling tool sets
- Sources of data collection (test subjects)
- Budget
- Availability of staff

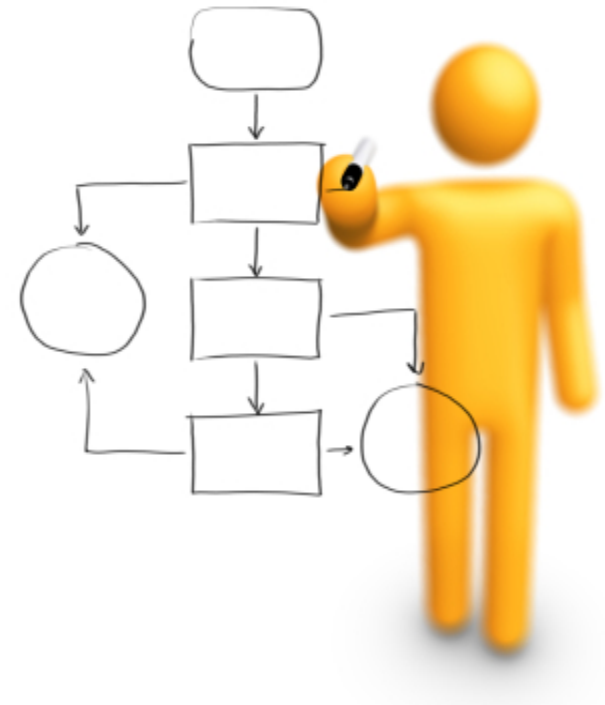
- **Product Design Approach**

- Build vs buy
- UBI, BBI, Geospatial, value-added services
- Intervention program vs risk segmentation only
- Evolutionary product approach



Getting Started

- Legal and Regulatory Issues
 - State requirements
 - IP issues
 - Privacy issues
- Enlisting the Services of a Guide
 - Avoid costly mistakes
 - Immediate access to skill base and capability
 - Reduced time to market
 - Integrated solutions



Working with Devices and Information

Devices and Information

- **Device Choices**

- ODB dongle or blackbox?
- Imbedded
- Smart phone
- OBD port interface vs none



- **Data and Data Plans**

- How many parameters should I poll from the device?
- Security and privacy issues
- 'All you can eat' data plans
- Compression
- Limitations of systems
- Create initial data model for structured data

Pilots

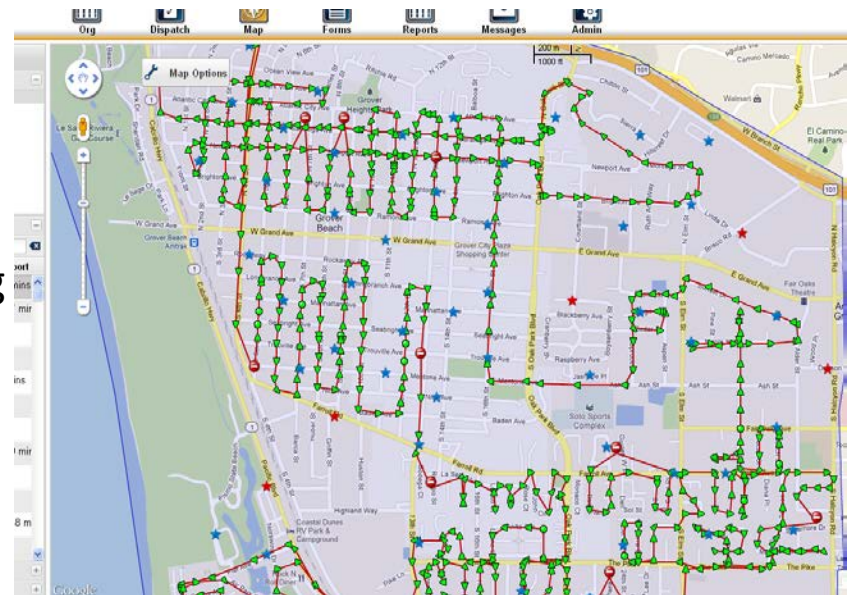
Internal vs. External Pilot

- Internal Pilot

- Familiarization with how devices work and data produced
- Ensure consistency of output
- Verify that data received represents factors under study
- Quality more important than quantity at this stage

- Field Pilot

- Collection of data for model building
- Development of business processes
- Quantity is king



Pilots

- Business process development
 - Fulfillment / termination
 - Customer service
 - Sales process
 - Handoffs to partners
 - Policy management system integration
 - Quoting, billing, and reporting
 - Customer, agent, and employee education
 - Leveraging insurance telematics ecosystem
 - Establish performance criteria
 - Customer, agent, and employee education



Pilots

- Product development
 - Lines of business / targeted customer segments
 - ISO model or unique product?
 - Marketing plan
 - Re-underwriting / rate change interval
 - Outsourcing analytics
 - Access channels (portals)
 - Incentive to 'opt in'
 - Regulatory compliance
 - Joining a telematics data consortium

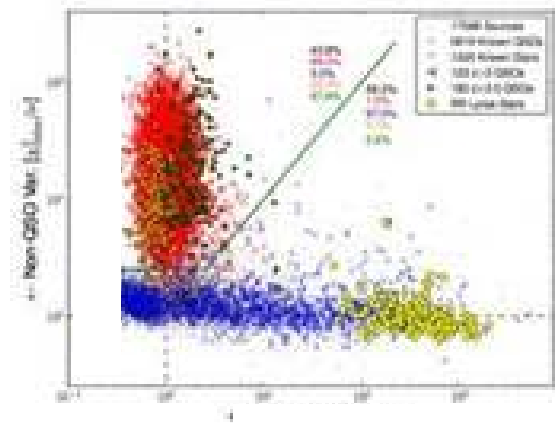


Building Models

Building Predictive Models

- Explore data before proceeding!

- Implement data model for structured data
- Time series fit of data
- Unstructured data issues
- Filter outliers, but DO NOT delete them



- Transform data before using modeling tools

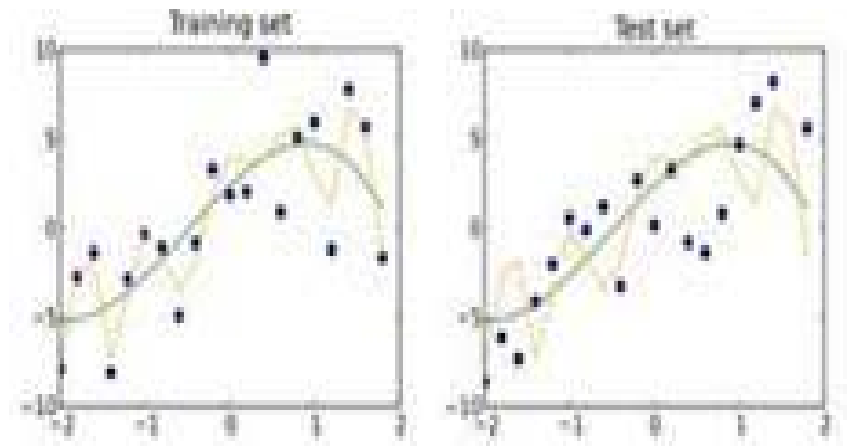
- Create arbitrary definitions of predictive factors and statistically validate over time
- Apply semantic definitions for special cases
- Loss and exposure information

Building Predictive Models

- Modeling and predictive analytics tools
 - Sampling method of current tool sets result in reduced predictive power
 - SQL based systems marginalized over 5 TB; ineffective for time-series analytics
 - Consider migrating to high performance environment

- **Overfitting**

- Not enough data
- Maintain high fitting ratio
- Reduce number of parameters



Product Evolution

Product Evolution

- Design with the end in mind, start small, and build upon prior success



- Tune product characteristics to unique segments
 - Combine value-added services and risk management to create new offerings
 - Add 'sticky' applications aligned with customer segments
 - Integrate product offerings into vehicle and smart phone environments
 - Develop propensity models to better understand what/when/where customers are likely to purchase

Product Evolution

- Expand product development into new lines of business
- Exploit automation opportunities in backend systems and processes
 - Incorporate predictive models into operational infrastructure
 - Further consolidation of claims central
 - Auto-reserving / auto-estimating
 - Fraud alerts
 - Leakage identification

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