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Weather Monitoring and Telematics Applications
in Insurance

White Paper

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Introduction

The insurance industry consists of multiple actors like actuaries, underwriters, and claims managers. It is notable to acknowledge how technology has brought these processes closer through platform interconnectedness. The COVID-19 pandemic has forced organizations to think of the new normal of remote operations. Weather monitoring in P&C insurance and Telematics for auto insurance are excellent examples of technologies we can utilize to bring innovation in existing processes. Let's discuss different perspectives on how the auto insurance sector can benefit from the use of advanced technologies.

Reducing claims leakage and preventing claims

Some common prevalent instances where leakage occurs (instances with few root causes) are:

a. Failure to detect fraudulent or over-inflated claims: Inadequate effectiveness of fraud rule engines, infrequent risk assessment, insufficient action to reverse previous fraudulent claims.

b. Errors in payments made to claimants: Disparate data systems leading to unreliable data, excessive reliance on manual processes, inefficient execution of procedures leading to inconsistent application of policy terms and conditions can lead to payment errors.

c. Missed opportunities: Insufficient documentation following investigations, poor communication with stakeholders, subjective approaches of claim managers in settling cases.

Technological advancements hold promises to improve risk monitoring and prevent claims, i.e., nipping the bud on claims which can be avoided through incentivizing policyholders appropriately. Telemetry, which refers to gathering data from remote or inaccessible locations and its' automatic transmission for monitoring, has been a boon for Home, Auto and Health Insurance in recent times. Innovations in device manufacturing have helped insurance companies collect vital data while being cost-effective.
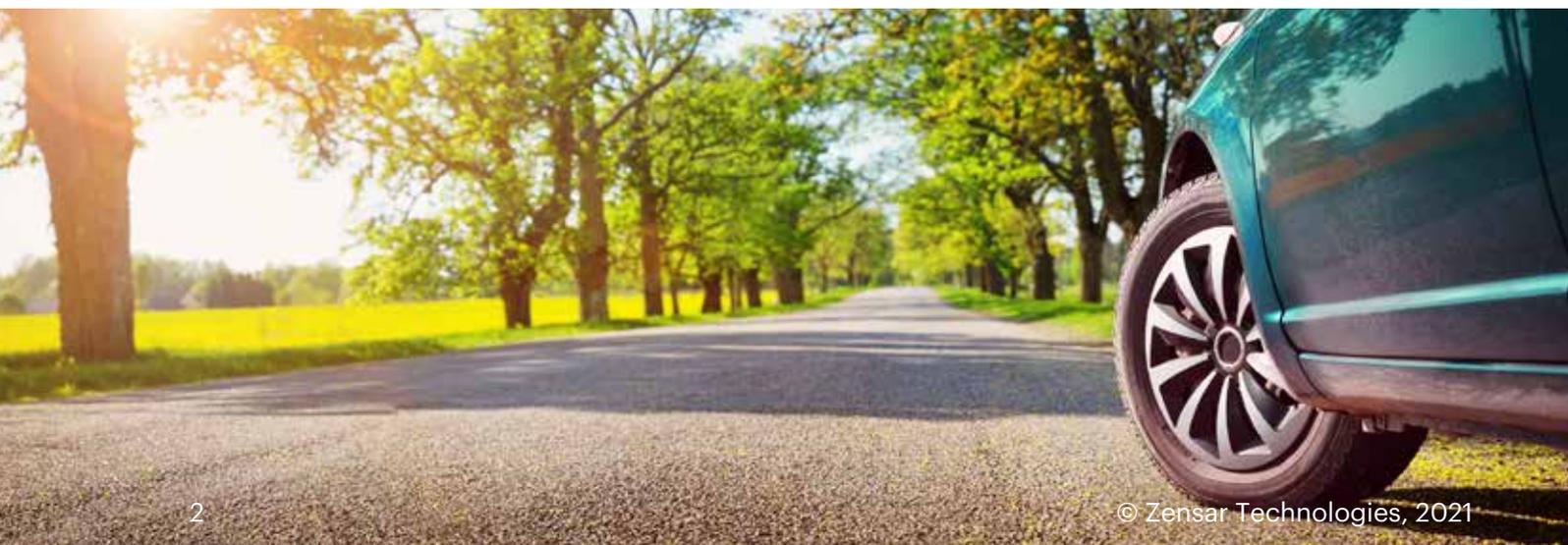
Scheduling surveys

In the event of a catastrophe, home insurance policyholders are required to contact their agent, broker and, or the insurer. This fulfills the obligation from the policyholders' part - lodging the first notice of loss. Next, the insurer is required to assign an adjuster for the claim who will attend to the claimants' request. Under normal circumstances, adjusters and related teams can be assigned within 24 hours.

In the case of natural calamities, adjusters and surveyors have a difficult time coping and assessing the damage caused due to calamities; therefore, insurers must identify time-saving technology and innovative solutions. Insurance companies such as RSA Group have adopted advanced meteorological services to monitor weather changes and detect significant events. Using these services, they can triangulate the impacted customers in the area and work out how they can best provide services to the affected. Therefore, an early weather warning can provide insurers and adjusters with the foresight to prepare their teams of building consultants, engineers, and forensic accountants. Proactiveness in such inopportune times helps enforce the insurers intent to support policyholders.

Quick response for roadside assistance

Among many risk factors such as speeding, human error, driving under the influence of substances which increase the risk of a crash and distracted driving, a significant risk mentioned is the inadequate post-crash care. Consider a car breakdown where the driver is unable to contact roadside assistance providers. As the report states, "Care of injuries after a crash is extremely time-sensitive."

Typical roadside assistance services provided include battery jumpstart, flat tire, fuel delivery, lockout, towing, winching, or extraction. Some car insurance providers, who provision roadside assistance, also provide medical evacuation and repatriation as an added benefit.

Telematics is the answer for quicker roadside assistance and medical evacuation response. Remote monitoring of a customers' vehicle can help mobilize local teams to reach the customer's location faster than a scenario where the customer must manually make the call for assistance. A smartphone or plugged-in device can detect an abrupt change in a trip, such as sudden deceleration and change in g-force, to identify a potential accident or breakdown. Let's explore some technological aids that can be leveraged for better automotive insurance experience.
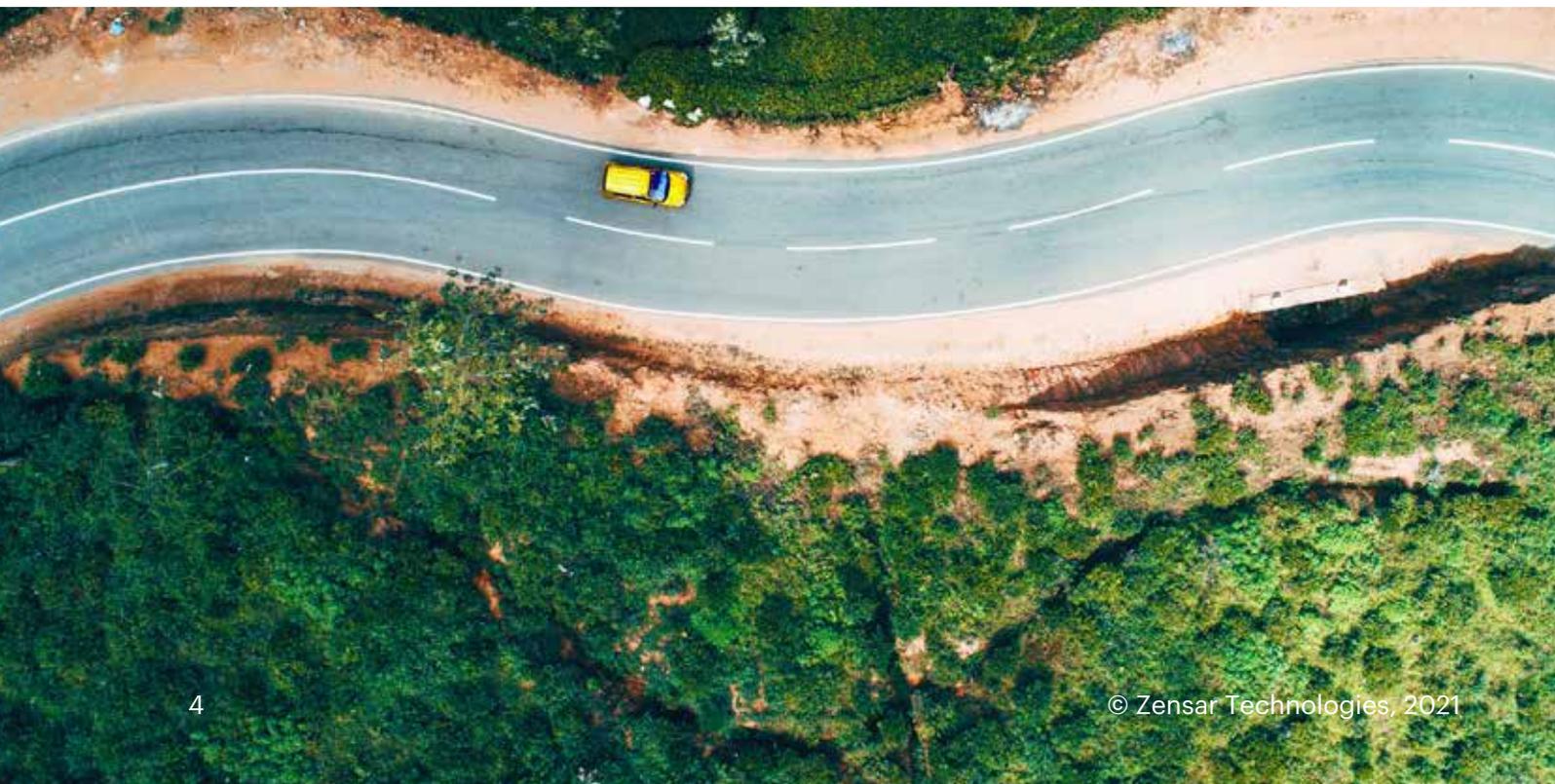
Telematics for vehicle insurance and safe driving

The telematics market size, which was $39.65 billion in 2018, is expected to reach $104.1 billion by 2025, with a CAGR of 14.7%. The current adoption is less than 20%, which gives the insurance industry scope to explore multiple products using telematics.

The most significant outcome of using such devices in vehicles is the data it generates. Apart from the on-board Devices (OBD), tools such as GPS Tracking Device and Event Data Recorders can be installed in the aftermarket segment. The speed data gathered in conjunction with these devices are generally more reliable.

Globally, the car-data monetization industry is poised to grow to $750 billion by 2030. This growth is contingent on multiple use cases, which can be categorized into three main buckets: revenue generation, cost reduction, safety and security enhancement.
As per a survey conducted by McKinsey, they found that car data-enabled features for which customers may pay depend on the data macro-categories and the perceived privacy sensitivity.

In increasing order of sensitivity, these include (but are not limited to):

1. **External road and environmental conditions**

    a. Information regarding ice warning on the road from ESP, fog from camera or sensors feed.

    b. The prominent use case is creating real-time maps, with prevailing environmental conditions.

2. **Vehicle status (technical)**

    a. Monitoring parameters such as oil temperature, airbag deployment, technical malfunctions report is vital.

    b. Use cases include car repaid diagnostics, automatic emergency calls for roadside assistance.

3. **Vehicle usage**

   a. Consider the data related to speed (as captured by an accelerometer, magnetometer, gyroscope), location, average load weight in the trunk.

   b. Utilisation of data for usage-based insurance or pay-as-you-drive calculations. Trunk weight data for calculation and payment of road and toll tax.

4. **Personal data and preferences**

   a. Data includes driver and passengers' identity, preferred radio station, and application-usage patterns.

   b. 'Memory' setting is a critical use case for this.

5. **Direct communications from vehicle**

   a. Rely on information such as calendar, telephone, SMS, email.

   b. A user can use speech control to send messages or email.

Conventional insurers protect their position in the market by modifying the policy underwriting and premium recalculation processes. This, however, doesn't last long, and other players can mimic the models or create improved methods. Particularly with the rise of InsurTech in the 2010s, traditional insurance players run a risk of becoming obsolete.

Apart from reinventing and innovating themselves, insurance companies have invested in telematics due to the following reasons.

- Preventing and catching fraud in automotive claims.
- Providing optimized pricing options to customer depending on their driving behavior.
- Suggesting corrections in driving behavior for improvement.

Usage-based insurance has something to offer to both key stakeholders: our customers, i.e., the insurers, and their customers, i.e., the insureds.

Insurers

In today's time, OEMs are gaining expertise in line-fitted devices (OBDs, dongles, etc.) and Uberization gives ride-sharing partners a headway in network management. Thus, insurers must move from risk aggregation to risk prevention. Apart from protecting their turf, using telematics is an excellent way of understanding the customer better. If the insureds' are willing to part with the necessary data – with the prospect of creating meaningful customer relationships, telematics-based portfolios can furnish significant improvement in burn costs and profitability per customer.

Insureds

Driving-behavior score driven policies are the biggest motivation for customers to adopt insurance policies that link premiums more closely with actual individual driving performance, thus driving affordability for low-risk drivers. This method provides an ability to control their premiums by improving their driving habits and contributing to the safety of the community.

Weather notifications for home insurance

Policyholders purchase home insurance to protect their homes from various perils such as fire, lightning, and storms, among others. The idea is to retain the pre-catastrophe economic state after the catastrophe has occurred. Insurance claims benefit not only the insured but also the third-parties involved, such as home improvement stores, auto repair stores, and healthcare facilities. While these entities help the claimants get their valuables repaired and have their health restored, the employment they generate and taxes, they pay ensure that economic growth is stimulated.

Insurers play the role of risk mitigators as they regularly collect and analyze information to disseminate financial and non-financial knowledge. These specialists and experts help prepare safety codes for fires and building codes concerning a property's' robustness in the face of hurricanes, and such expert content can then be propagated to customers. However, if we look at the process of claiming the sum assured against a policy, it is seen that physical documentation is required to validate home and policy ownership. If a catastrophe strikes, the policy owner or claimant may not have the time to keep these documents carefully, which could get destroyed in the disaster. Additionally, while in most cases, homeowners' policies allow filing within one year of the calamity, an early claim application is always recommended to expedite the process.

Furthermore, insurers often hire third-party surveyors to conduct a survey of the affected area. When catastrophe hits, and there aren't enough surveyors available, the investigations usually take a long time to be completed leaving customers disgruntled. Additionally, planning surveys gets affected when the number of requests is higher than the number of surveyors available.

Government departments have honed their algorithms to forecast weather patterns. Moreover, there are improved sensors and satellites in the market, which will support data gathering and improved machine learning algorithms to help identify weather patterns.

Statistical models, artificial neural networks and incoherent logic have been used in various studies to determine the weather; they have had their shortcomings. Either they have relied a lot on past years data, or they focussed on adjusting the weights to get the correct output for the given input, without paying heed to mathematically defining the data relationships, or suffered from anomalies such as overfitting, local minima, etc.

A practical algorithm to forecast weather is the sliding window algorithm. This technique assesses weather slices of the current year, like the week that went by, and of past years too, upcoming weeks. This data used in conjunction with prevailing meteorological conditions help build an accurate picture of the coming weeks' weather.
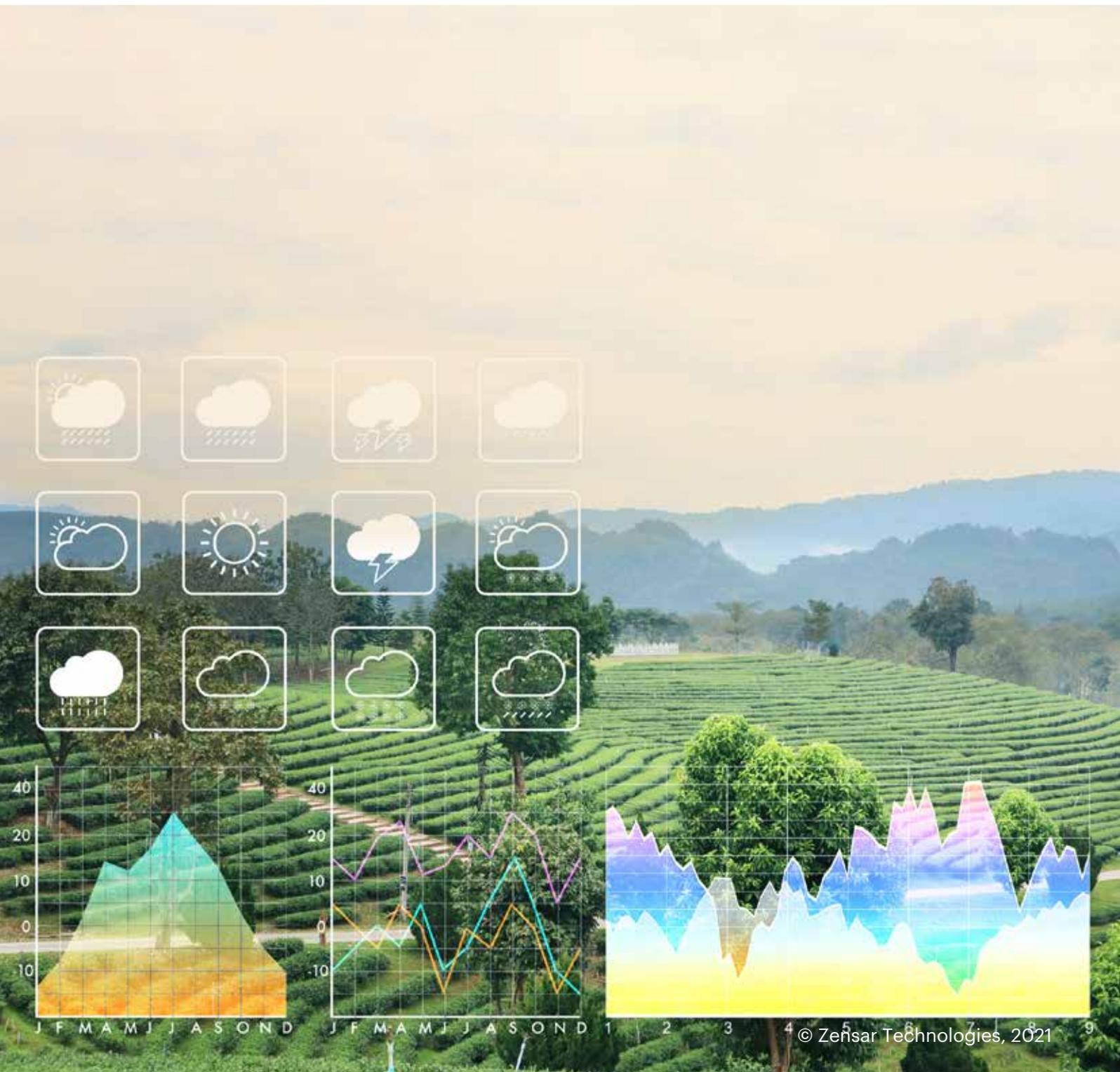
Our point of view on telematics

Utilizing data generated from OBDs and dongles, a plethora of insights can be gleaned. The graph here represents how deep learning technquies break down multitudes of data and arrive at logical outcomes based on brakeing events, drastic acceleration or deceleration, sharp turning, lane changes and idling.
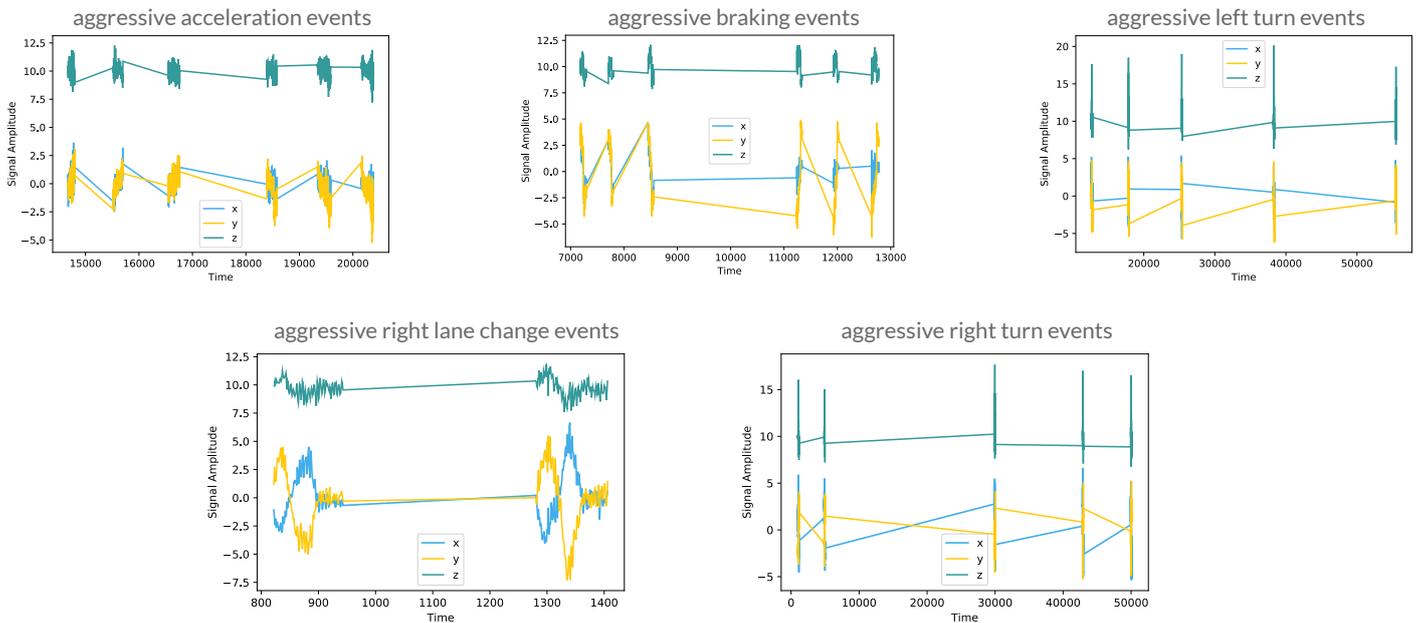
These parameters, when put together on a dashboard, help insurers and insureds better understand their driving pattern. Improving numbers are inversely related to insurance premiums. While this can lead to the payment of lower premiums for policies, in the long run, the number of claims of low-risk customers drops. Here's a depiction of the same.

PERFORMANCE METRICS	Acceleration	Braking	Turning	Lane Changing	Idling	Total
	30%	58%	80%	83%	50%	60%
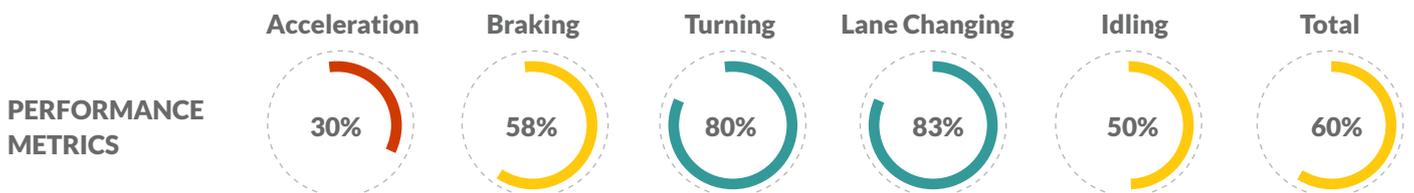
Used in conjunction with insureds' data such as age group, marital status, occupation and age group, actuaries, and underwriters, one can create focused risk groups and pricing strategies.

Weather prediction

Weather condition insights allow insurers to give notice to the policyholders and surveyors about an upcoming calamity. In conjunction with our Digital Claim Servicing Platform, weather insights will guide insureds and surveyors about the forthcoming weather conditions. Videos related to the context, i.e., a natural calamity, will help the insureds understand steps they need to take to safeguard themselves and their belongings.

Assuming a hurricane of level 2 is about to strike a region, videos showing how to protect the windows of the house, electronics, and fragile items in the house, blocking areas to avoid seepage, etc. can be displayed based on the type of disaster.

Let's consider adjusters and surveyors, who will be using a similar app. They will also be informed in advance about impending disasters in regions that they cover. This will help them prepare their taskforce to conduct surveys in an efficient manner. So, such insights will help resource planning and scheduling.

Conclusion

As major global events such as the current pandemic, compel us to step back to review the situation and explore technology solutions which will enable us execute our tasks unhindered, we should be on the lookout for quickly deployable solutions which cater to the differing needs of the organization.

The telematics and weather prediction solutions described are two such solutions, which when represented differently, address the needs of key stakeholders in the organization and the customers too.

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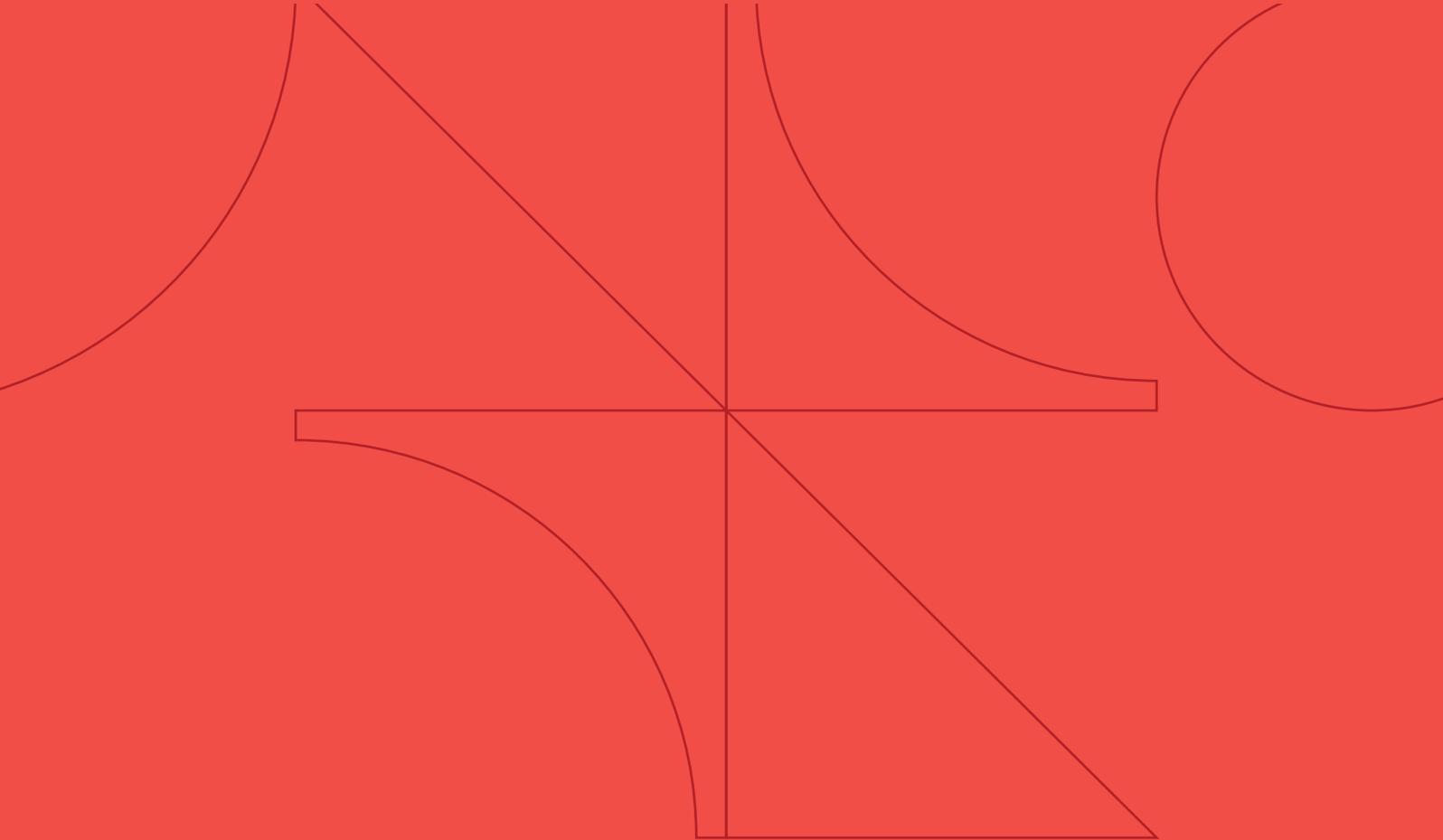
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