Vehicle Telematics at an Italian Insurer: New Auto Insurance Products and a New Industry Ecosystem

This article describes how a partnership between one of Italy’s largest auto insurers (Unipol) and a systems integrator (Octo Telematics) yielded a new and profitable customer value proposition for the insurer based on a customer’s driving and risk profiles. The heart of the system is a small telematics device installed in a vehicle that captures and transmits data about where, when and how the vehicle is being driven. The emergence of the new ecosystem of stakeholders to support telematics-based auto insurance provides lessons for leaders in other industries as they explore the transformative potential of emerging technologies.1,2

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Insurers’ Use of Vehicle Telematics Data Offers Lessons to Other Industries

Vehicle telematics technology involves the collection, transmission and analysis of data collected from a device installed in a motor vehicle. Such usage-based driving information is a powerful decision-making tool for auto insurance companies. Decades of auto insurance practices are changing as insurers start to price insurance policies based on data collected from an on-board unit (OBU), such as vehicle speed, acceleration and location. Personal driving data can be used to calculate a more precise and fair insurance premium, provide feedback to drivers to optimize their driving style and stimulate customer engagement and interaction. These data sets can also be mined to create entirely new applications—e.g., certification of a vehicle’s usage can be generated when it is sold.

The use of telematics by auto insurers for detailed data generation, monitoring and analysis will be mirrored by other industries as organizations enter the era of continuous tracking—from “the internet of things” to smart homes. Other industries can learn lessons

1 Omar El Sawy is the accepting senior editor for this article.
2 The authors wish to acknowledge the support and contributions of Massimo Gilardi, Mario Pandolfi, Giuseppe Zuco, Federico Santini, Eugenio Lamberti and Alexandro Sances from Octo Telematics S.p.A.
from the experience of auto insurers with vehicle telematics.

There is more to telematics, though: the technology is creating an entirely new ecosystem of various stakeholders, including installers of tracking devices, security operation centers, data analyzers and other third parties providing value-added services. As well as restructuring the roles of insurers, drivers and third parties, the use of vehicle telematics technology can also expand the role of governments. This ecosystem restructuring creates opportunities for new value innovation as a result of the realignment of data, function, price and cost positions.

The potential benefits from vehicle telematics fall into three main areas: financial, environmental and societal. Financial benefits accrue to drivers in terms of lower insurance premiums, to auto insurance companies in terms of reduced claims and to government in terms of reduced healthcare costs related to automobile accidents. Environmental benefits include reduced fuel consumption, optimized traffic patterns in cities and rationalization of replacement parts. Societal benefits result from improved drivers’ behavior through incentives and feedback. By monitoring driving data, insurance companies and government bodies can “educate” individuals on their driving styles, design appropriate laws (for example to limit the traffic—or the speed—in specific areas and hours) and introduce incentives to lower the risk of car accidents.

The range of potential information-based products flowing from vehicle telematics is substantial: safety services, reconstructing the kinematics and dynamics of a crash, usage-based “pay per use” and “pay per risk” insurance reporting, remote vehicle diagnostics, up-to-date information about traffic flows and bottlenecks based on floating car information, road toll charges, fleet management and environmental impact estimation.

Governments are acting on the many telematics benefits that promote good driving behaviors. For example, in June 2012, the municipality of Naples, an Italian city infamous for fraudulent crash reports and auto thefts, signed an agreement with insurance company TUA to promote the use of vehicle telematics with the aim of spreading benefits to good (safe) drivers who were penalized in the past by geographical parameters.

The use of insurance-oriented telematics technology began to emerge in the early 2000s. By 2012, usage-based insurance was making inroads in scores of the most important global markets, including much of the European Union, Brazil, South Africa and the U.S. For example, the U.S. has several large players offering pay-as-you-drive insurance, including Progressive, Safeco and State Farm. In the U.K., the Automobile Association launched pay-as-you-drive Drivesafe into the marketplace in 2012, with several usage-based insurance players, although other British vehicle telematics insurance initiatives had folded in earlier years. The two main variants of pay-as-you-go insurance are explained in the box.

### Pay As You Drive and Pay How You Drive

Currently, most insurers base car insurance premiums on static demographic data, such as postal code/zip code, age and driving history, such as speeding violations. But by using the data collected from an OBU, auto insurance costs can be paid for according to the distance driven by an individual, rather than as a fixed premium. In insurance parlance, this type of usage-based insurance is called pay as you drive (PAYD). The driver pays variably depending on actual distance driven.

Pay how you drive (PHYD) insurance is based on actual driving behavior—the roads the driver uses (location data can tell the insurer if a road segment is bumpy or has frequent accidents), the time of day the vehicle is being driven (night and rush hour are riskier times), whether the vehicle is driven in bad weather and the frequency of “hard cornering” (taking very sharp turns fast), excessive acceleration and heavy braking incidents (the latter are common among teenage drivers).

Gartner Research placed vehicle telematics at the peak of the hype cycle in 2010. Technologies at the peak of the Gartner hype cycle are mature but not yet widely deployed around the world. In this report, Gartner suggested that, at least

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4 “Floating car information” involves the collection of data about the location, speed and direction of travel of vehicles fitted with OBUs.

in the U.S., it is the “creepiness factor” of being monitored that has deterred broader public acceptance of vehicle telematics. ABI Research sees the barriers as not only customer privacy concerns, but also the industry’s self-selection of low-risk drivers and a lack of historical data to compare approaches, as well as technical issues such as the absence of standards, the installation of telematics hardware and IP litigation. Yet even with the slower-than-anticipated diffusion, the potential value created by vehicle telematics offers lessons for other industries in terms of the potential of information-intensive technologies to restructure a business ecosystem and to generate benefits across it.

In this article, we first describe the telematics initiative by Italian insurer Unipol in collaboration with a telematics supplier (Octo Telematics). Unipol, with the help of Octo, continuously captures driving data, calculates personalized and fair-usage-based insurance premiums and provides feedback to drivers that choose to participate in the program. Unipol’s telematics program has not only resulted in lower premiums and improved services for drivers, but also improved customer retention. The article concludes by drawing lessons for CIOs in other industries as they assess the potential restructuring of their own ecosystems based on new information-sharing partnerships and digital business models that depend on customer tracking.

Crisis in the Italian Auto Insurance Industry

At the end of the 1990s, the Italian auto insurance market was in trouble: it suffered losses of €3.7 billion ($4.5 billion) from 1994 to 1998. The cost of accidents increased by 44%, rising from roughly €3 billion to €4.4 billion. The number of accidents resulting in physical loss doubled over the same period, accounting for 53.3% of the total amount of damages. Fraud was a significant concern, compelling ANIA (Italian Association of insurance companies), police forces and judicial authorities to implement costly control structures to gather data and certify the real damage or determine whether fraud was involved.

Then, in the early 2000s, the Italian insurance market was shaken by another event: the liberalization of the market and tariffs. Initially, this flexibility induced a price hike without any improvement in service quality; in the second stage, insurance companies engaged in a price war, which hurt their profitability.

At that point, the Italian auto insurance companies recognized they needed a new strategy. Each of the players began to focus on differentiation based on tailored insurance policies. Tailored policies were to be the tool to compete in the market, to control costs and to improve company profitability through more informed customer selection and risk management. However, the auto insurance personalization variables that companies were using were insufficient. Differential premium pricing was based only on geographical area, vehicle specification, age, gender, profession, marital status and estimated kilometers driven. Companies needed a personalized insurance premium that would more reliably reflect the risk of insuring an individual.

In an effort to counter fraudulent auto insurance claims, Italy, like other developed insurance markets, established a national database. The centralized database is operated by ISVAP (Istituto per la Vigilanza sulle Assicurazioni Private e di Interesse Collettivo), the Institute for the Supervision of Private Insurance. It includes crash-related data going back to 2001, with insurers supplying their data on a yearly basis. The database is available via web interfaces to insurance companies, police forces and the judiciary to act against fraud. However, the database has been poorly updated by insurance companies and thus has had only limited impact on pricing and fraud.

Unipol’s Telematics Initiative

Unipol realized that the ISVAP database was insufficient for decision making and considered how to improve its driver data and how to innovate its business model (see box for a brief description of Unipol). The crisis in the auto

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7 Source: ISVAP (which supervises the Italian insurance industry and is responsible for controlling tariffs and for the evaluation of the adequacy of variables used to calculate insurance premiums) and ANIA (Italian Association of insurance companies), 2000.
insurance industry was pushing insurers to seek dramatic price reductions and a different profit formula. This could be addressed by developing a new data-rich pricing approach.

**Unipol Background**

Unipol Assicurazioni is one of Italy’s largest insurance companies, with total insurance premium income in 2010 of €8.9 billion (US$10.9 billion). The parent company, Unipol Gruppo Finanziario S.p.A., is the fourth largest firm in Italy, with assets of €46 billion (US$56 billion). It has more than 6.5 million customers, with a network of more than 6,000 agencies and about 300 bank branches. The insurance arm has grown via acquisition and mergers. In 2009, Unipol and Aurora merged (to form UGdF), and then in 2011, Naval Insurance was integrated into the firm. In July 2011, the company officially became Unipol Assicurazioni, Unipol Insurance.

In 2003, Unipol approached Octo Telematics (see box), an Italian telematics provider, to set up a pilot program to install telematics devices in customer vehicles. Ten thousand Unipol clients were invited to participate in this experiment, and 2,500 customers agreed to have telematics devices installed in their vehicles. Unipol's total cost of the pilot was a modest €1.2 million (US$1.5 million). Much of the cost—the installation of the telematics units—was incurred by Octo Telematics. See Figure 1 for Octo’s value proposition.

The pilot was concluded after two years and was deemed a success. Compared with Unipol’s other customers, automobile crashes for drivers participating in the pilot were reduced by between 20% and 30%, and auto thefts were reduced by between 30% and 50%. Customers perceived the benefits of telematics as increased personal safety and increased personal asset protection. Moreover, they did not express concerns about personal privacy.\(^8\)

**Octo Telematics Background**

Octo Telematics S.p.A. is a large telematics provider. It specializes in the provision of telematics services and systems for the insurance and automotive market. Based in Rome, Octo has 50 corporate clients, over 1.2 million global customers (2012) and is installing an average of 1,500 OBUs per day. Octo has subsidiaries and partners in over 20 countries across Europe, the U.S., South America and Asia. To date, the company has analyzed more than 44 billion km of travel data and has collected more than 22 billion data points on vehicle positions.

Following the successful pilot, in 2005, Unipol decided to design a specific insurance policy for telematics users (approved and registered by ISVAP). The new insurance policy was named Unibox. Unipol offered Unibox customers a 10% discount on premiums covering accident damage and 50% on premiums covering thefts. This was the first telematics-based insurance policy in Europe.

Since 2005, Unibox, and its insurance policy successors, have helped Unipol to remain successful and profitable, by attracting new and better customers, as well as opening up

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\(^8\) Privacy and intrusive monitoring were a concern from the start. It appears that there is a significant population of drivers in Italy and elsewhere who are willing to trade-off privacy for a bundle of insurance discounts and potential personal safety and protection benefits.
new customer segments. Drivers who purchase telematics-based insurance pay lower premiums; good drivers are seeing savings from 5% to 30% on their premium payments. Drivers also have other benefits: after an accident, medical assistance arrives more quickly, reducing the risk of severe injury or death.

Internally, Unipol had to develop managerial and operational processes and new competencies to support its new offerings:

- Sales services to support new insurance policies and data entry of new contracts to initialize the service network
- Administrative services to charge and bill new policies
- Customer services for customer management and contract management (information and support on policies)
- Telematics web services that deal with data management and reporting.

Below, we describe the technology and information systems supporting Unipol's telematics-based insurance business.

**Unipol's Telematics Technology and Information Architecture**

The OBU and GPS location data are captured and transmitted from a vehicle via conventional GSM cellular networks. (Figure 2 depicts the telematics information architecture). The data flows into the data exchange repository at Octo that is the heart of the telematics infrastructure. This repository is maintained by Octo. Driving data, including crash and theft data, first flow to Octo and then to various stakeholders through an application program interface (API). New participants benefiting from these information flows are Unipol's policy holders, who can access data on their driving and pricing via the web. This web-based display is called the customer dashboard and it represents a personalized report on a policy holder's driving performance. The dashboard itself is available from Octo as a...
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“white-label” product. For example, the U.S.-based Safeco website is hosted by Octo but has the Safeco look-and-feel.

The Unipol/Octo information architecture generates and distributes large amounts of data that forms the basis of value-adding analytics using “big data” that supports decision making across stakeholders. Recent data transmission and storage statistics include:

- 9 million vehicle trips per day
- 55 million data transmissions per day from OBUs. While on the move, data are transmitted every 2 km. Each data package transmitted from the OBU to Octo is about 150 bytes, containing data about vehicle position (longitude and latitude) and speed. Larger, less frequent packages can be 1Kb, containing more data on driving behaviors like cornering and braking.
- 15 Gigabytes/day stored
- 18 Terabytes of data stored overall since 2004

A car that is “sleeping” sends a position each 12 hours; during a theft event, the vehicle sends its position each 30 seconds.

A vehicle joins the architecture once an OBU is installed at one of the third-party installation locations across Italy. Installation services include mounting, repairing, warranting and dismounting the units. Installation of the OBUs must be done under supervision since the devices must be tamper-proof. Octo often plays a critical role in setting up these third-party installation networks. Upstream are the various logistics services, which include purchasing, testing, storing, shipping, maintaining and refurbishing the telematics hardware.

Integrating the proprietary firmware in OBUs with standard technology is achieved via data exchange rules. The web-based applications and (back end) communication routines that communicate important information to customers and third parties like the government and consortia have no large set-up costs and use standard communication technologies—SMS or MMS or smartphone applications. These web- and cell-phone-accessible applications enrich offerings to actual or potential insurance customers.

Unipol’s information architecture supports a large continuous data architecture that includes five main data groups:

- **Trip data.** Most of the data that flows through the system is in this category and includes trip duration, total kilometers traveled, kilometers traveled by type of road (motorway, urban areas, other types of roads), travel by time of day (rush hour, daylight, night), acceleration, deceleration and sharp turns.
- **Policy data.** This information is largely static and includes request to open new voucher; date and time when the data flow is initiated, date of the first installation and vehicle registration number.
- **Cartographic data:** This information comes from the digitized maps that are supplied to Unipol customers.
- **Crash data.** This data is transmitted only rarely, when an accident occurs. The stored information that is sent automatically includes crash timestamp, latitude, longitude and the longitudinal and latitudinal accelerations of the vehicle at the moment of the crash. Multiple position records are created for every crash with up to 100 acceleration data points. Figure 3 illustrates some of the computations made from crash information. These computations show the inertial accelerations recorded inside the vehicle at the time of impact. The crash data, complemented with additional information derived from the various parameters continuously recorded by the OBU during a journey, like speed, direction, location and acceleration, is then summarized into a crash report, which can then be used to analyze the circumstances of a particular car accident.

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9 A voucher is where an insurance agent creates, via a web application, a new account (driver and car) linked to a new policy (contract). From that point, the process of OBU installation starts, as does the tracking history.
The crash data also includes emergency information. When an accident occurs, an automatic alarm is sounded at the control room, where actions can be taken to contact the driver or—depending on the crash intensity—the first responders. Understanding the location and the circumstances of an accident in real time enables immediate and appropriate assistance to be provided. Faster response to accidents can reduce injury risks. In Italy, there are three national security firms that receive crash-related messages from Octo.

Real-time data analysis and reporting is enabled from a multi-services center that is accessible via the web by the main business partners. Some aggregated data, specifically, fuel consumption, CO₂, data emissions and traffic behavior, are passed to Italian government departments. This category of data can be used to track events that cause traffic jams and provide help on how to make better use of traffic lights. Trial data from a sample of 17,000 cars is also being shared with ANIA to support collaborative research that will reduce automobile accidents, thefts and fraud. There is the potential to share more data and collaborate with ISVAP to reduce automobile accidents, thefts and fraud.

Telematics hardware and wireless communications technologies are continually evolving and must be able to respond to specific requirements of security, robustness and shock resistance. Upcoming generations of OBUs have the potential to integrate with many existing and future automobile systems. For example, Intel has developed a vehicle-oriented technology that can record, among other variables, whether the seat belts were being used at the time of an accident.

Future OBUs are likely to be much “smarter.” Consider the potential, for example, to integrate an OBU with AT&T Labs’ still-experimental Mobileye system. Mobileye includes a smart camera, sensors and proprietary algorithms “to detect and alert drivers to unintended lane departures, imminent collisions, pedestrians, bicyclists and motorcyclists on the road and even has the ability to read speed limit signs, intelligently control high beams and alert drivers of the most common forms of accidents.”

Telematics technology and the related information architecture form the foundation on which new value can be created in the automobile and auto insurance industries. The impacts of telematics on Unipol, its customers and other stakeholders are many, as we now describe.

### Unipol’s Telematics Value Proposition for Customers

Telematics has had a significant impact on Unipol and its business model: the way the firm does business, the configuration of the company’s resources and the company’s value chain directed at creating value for customers. The use of telematics has provided an important boost to service innovation, enabling Unipol to structure

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10 Instead of automatic data transfer, the customer can trigger a manual alarm to the security control room via a specifically installed push button. Via computer, the call agent may access the telematics device to connect with the car, request a current location and status, and report to the customer or appropriate authorities.


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Unipol developed high-quality assistance services that were better and earlier than its competitors in terms of accident response and vehicle location in the case of theft and kinematics reconstruction of accidents. It also enabled Unipol to contain premium costs. The largest payoff from telematics is based on Unipol’s new value proposition, which includes its Safe KM program and a brand new identity “SICURCITY – dove la sicurezza è a misura d’uomo” (where security is tailored to the individual).

Under the Safe KM program, Unipol’s three macro customer segments and related offerings are:

1. **Basic customer offering.** Customers pay based on kilometers driven. The less the vehicle is used, the lower the cost of insuring it.

2. **Intermediate customer offering.** Customers also benefit from automatic calling of emergency services. If a customer’s vehicle is involved in an accident, the call center will forward a message over the GSM network to the nearest public safety dispatcher, who will guide emergency services to the location of an accident.

3. **Car theft location service.** Using satellite and cellular technology, a control center is able to monitor the vehicle’s location and forward this information to the police, which results in high recovery rates for stolen vehicles. Wireless immobilization of a stolen vehicle is also possible.

The Safe KM discount is automatically included in the insurance premium price for the first year, and the premium is linked to distance driven in subsequent years. The main parameters for determining premium prices are engine power and the total amount of km driven annually (See Table 1).

Unipol offers bonuses and incremental discounts to Safe KM customers for good driving. In some cases, accidents are “forgiven”; in others, “bonus miles” (extra miles) are given without an increase in premium. When a good driver renews his/her auto insurance, Unipol will look at the data collected over the past year and, if the driving profile has improved, the premium price will be reduced at renewal.

Drivers are given a personalized summary report on their driving, along with a periodic driving score. These usage statistics and scoring information are available via the web to Safe KM customers and to Unipol’s customer care operators. The report provides historical information about a customer’s vehicle(s) in summary form and includes numerous statistics: total mileage driven, fraction driven on motorways vs. urban areas vs. extra-urban areas, and day vs. night. This service gives information about the usage of the vehicle, down to individual trips and events that occurred within each individual trip.

Each driver is also scored on a risk profile based on algorithms that analyze and foresee the driving habits based on time of travel, distance

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traveled, types of roads used, speed, driving at night, accelerations and levels of braking. See Figure 4 for some examples. The algorithm determines whether, after a given period of time, the driver is eligible to receive a "bonus" on his/her insurance policy.

Benefits of the Telematics Business Model

Benefits for the Insurance Company

Vehicle telematics enables Unipol to proactively select safe drivers by using objective and dynamic parameters to determine the level of risk for individual drivers. Additionally, the company has been acquiring customers that other insurers have rejected based on traditional static data, such as residence and vehicle features. As a result, Unipol has enlarged its customer base by nearly 10%. By May 2012, telematics-based policies represented roughly 20% of Unipol's total business (622,116 policies), up from 2005, when cars with an OBU installed represented 2.6% of Unipol's customer portfolio.

Customers appear to be satisfied: there has been a 10% increase in customer retention from 2009 to 2011. Certainly, discounts on insurance premiums explain some of their satisfaction. Additionally, telematics-based insurance encourages customer engagement, interaction and, in some cases, more responsible driving. Better driving has reduced the number of accidents by between 20% and 30% and, as a consequence, has reduced claims (and fraudulent claims) by between 30% and 50%, the amount paid out in claims and the costs of related investigations.

As a result, telematics has increased Unipol's revenues and improved its profit margins. Even though customers receive discounts ranging from 5% to 30%, the company has improved policy profitability from 11% to 30% (depending on the discount rate). Telematics has also shifted risks away from Unipol. For example, the OBU financial risk is passed on to the vendor: the technology investments are covered by Octo Telematics.

Benefits for the Customer

By using the telematics data to optimize their driving style, customers not only become safer drivers, but also reduce their insurance premiums. Unipol's insurance policy rate discounts for a vehicle fitted with an OBU are typically:

![Figure 4: Personal Driver Reports on Speed and Braking Events](image-url)
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- For fire and theft (F&T): 60% discount. Typical F&T rates are 2% of the value of car; so for a €20,000 ($24,400) car, the annual rate used to be €400; it has now been reduced by €240.
- Third party liability: 20% discount
- Comprehensive: up to 50% discount.

Additionally, changes in driver behavior lead to less driving, lower fuel consumption and shorter travel times—resulting from drivers learning how to improve the handling of their vehicle based on the telematics data. Faster response to accidents can reduce injury risks. Stolen cars can be located and recovered more quickly. If any failure or anomaly is detected in vehicle performance, the driver will receive a notification recommending possible dates for service, with the replacement part having already been ordered.

Benefits for Technology Providers and Partners

Telematics creates opportunities for a range of technology firms to build and support the complex infrastructure. With the Unipol telematics-based offerings, the main systems integrator is Octo, which has developed the IT infrastructure and software to support the telematics business. Octo’s revenue stream is based on usage of the telematics devices. It is paid 6% of the discounted premium during the life cycle of a policy—which averages nine years. Octo estimates its annual cost per installed OBU at roughly €45 ($55), none of which is passed on to Unipol.

Other system integrators can introduce economies of scale through integrating traditional IT services into auto telematics. Third-party OEMs can offer optional services to auto owners by using data produced by the OBUs. Car makers have been experimenting with OBUs for many years (e.g., GM’s OnStar). Telematics provides the opportunity for new licensing and revenue streams for OEMs and car makers. Finally, telecom companies benefit by carrying and charging for the data transmitted from cars to the telematics technology infrastructure.

As with other information-based ecosystems, the systems and benefits grow faster when there are architectural standards. But standards have not yet emerged for telematics. Telecom companies will gain more market space if they are able to standardize communication protocols and develop compatible applications that result in more efficient transmission of telematics-generated data. Standardization will drive data into the cloud, resulting in more companies having access to that data and using it to offer personalized and competitive products. Unipol managers see this movement into the cloud as both an opportunity and as a competitive threat.

Benefits for the Environment

Vehicle telematics provides a unique case of a technology-based innovation that can provide environmental and societal benefits in addition to the financial benefits to firms and consumers. For example, traffic flows can be improved based on real-time traffic information and the optimized functioning of traffic light systems based on cues in the proximity—which can result in a reduction in pollution. Furthermore, telematics data can optimize vehicle maintenance programs, which means fewer replacement parts and automotive breakdowns.

The lower premium incentives of PAYD policies encourage less driving, thus reducing traffic congestion in the world’s cities, with consequential environmental benefits. Reduced driving also improves traffic flows. Both of these are virtuous circles of benefits. Additionally, an informed and aware driver can optimize his/her driving to reduce the car’s fuel consumption. Over the life cycle of an average car, emissions can be reduced by over one ton of CO$_2$. Moreover, vehicle telematics generates reliable and real-time information about traffic conditions, enabling drivers to make better choices about their routes and thus spend less time on the road.

Benefits for Society

Vehicle telematics facilitates emergency response in several ways. First responders can quickly be dispatched to the scene of an accident. Understanding the location and the circumstances of an accident in real time

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enables immediate and appropriate assistance to be provided. Faster response to accidents can reduce injury risks. By 2015, the European Commission wants all new cars and light vehicles to be fitted with eCall life-saving technology that automatically dials 112—Europe's single emergency phone number. The expectation is that installing OBUs in all new cars within the EU will save hundreds of lives annually and reduce related healthcare costs.

Data about driving habits obtained from OBUs is useful in many ways. Accidents are reduced when drivers are exposed to their driving profiles and crash reports, and when drivers receive incentives to improve their driving habits. In 2011, 9.6% of Unipol-insured autos with OBUs were involved in accidents, compared to 13.7% for those without OBUs. Fewer accidents and faster response to accidents create a societal benefit by lowering national healthcare costs.

Reliable data about crashes has many potential benefits. Analyzing crash report data helps the authorities to understand the course of events that preceded the crash and devise measures that can reduce the likelihood of similar incidents occurring, and thus benefit society as a whole. Reliable crash data also saves valuable time for the customer and insurance company, decreases the probability of fraud and helps reduce investigation costs.

If a car fitted with an OBU is stolen, the customer can contact the security control room directly. The call agent can connect with the car, request a current location and status, and report to the customer or appropriate authorities. This improves the speed of recovery and recovery rate.

Because of the potential for social and economic benefits, vehicle telematics is a darling of governments. Moreover, countries like Brazil and Italy are working on national laws that mandate OBUs for emergencies, as well for reducing fraud and theft. As mentioned above, the European Commission wants OBUs installed in all new cars and light vehicles from 2015. Governments are also working on national and multi-lateral regulations to foster and standardize vehicle telematics services.

Despite the many societal benefits that could flow from telematics based innovation, there are risks as well. Soon there will be massive amounts of individually-linked driving data flowing through the Italian ecosystem, from systems integrators, to insurers, to other third parties. The threats to privacy are non-trivial as, for example, the data services have access to exact information on where a car’s driver has been on any given day.

**Insights for IT Leaders**

1. **A New Ecosystem is Crucial for the Creation of New Value-Added Services**

   The Unipol case demonstrates how even a traditional industry, like auto insurance, can create advantages with an emerging technology that is at the heart of a new ecosystem of services, resources, data and stakeholders, as illustrated in Figure 2. This ecosystem involves new players (e.g., manufacturers of OBU sensors, installers of OBU installations), as well as information-based items (e.g., kilometers driven during daylight) and information flows (e.g., change of position). As well as the new players, there are new roles for traditional players (e.g., roadside assistants) and new challenges for standards bodies.

   Different stakeholders have joined forces to design the technology, share information and work as a dynamic meta-business system to build a valuable asset—without having to merge. In this case, the systems integrator (Octo) played the role of market facilitator and enabler; it set up and refined the Italian network of installers, OBU manufacturers, telecom providers and insurance companies.

   In the new ecosystem that has emerged to support Unipol’s telematics-based auto insurance offerings, there has been a dramatic emergence of new or modified data/information players:

   - Data movers (e.g., the telecom providers that transmit data from the OBUs to the telematics infrastructure)
   - Data integrators (e.g., Octo)
   - Algorithm creators that produce algorithms and mathematical models to create value for the insurer and its customers
   - Storage providers in the cloud
   - Data analysts (e.g., at Unipol or ISVAP)
Additionally, although not described in the case, there is the potential for all kinds of data resellers (e.g., for traffic data).

2. Realizing New Value Depends on Organizational Learning and Adaptation

In 2005, Unipol pioneered the use of vehicle telematics in Italy. Today, with a million OBUs installed, it is now a major telematics user. But relative to the entire Italian vehicle market, there is still a long way to go. The full benefits of Unipol’s information-intensive technology investments have not been instantaneous. The company’s business model has been evolving, with incremental improvements, since 2005. The timing of these enhancements is tied to extensive organizational learning and gradual consumer acceptance. For example, Unipol only recently started to invest resources to evaluate driving behavior. The next wave in telematics-based insurance will incorporate advanced functions such as semi-automatic segmentation algorithms to estimate the personalized premiums on the basis of driving behavior.

Conceptually understood when vehicle telematics was launched a decade ago, implementation was protracted. This lag was caused by inexperience in transforming “big data” using complex algorithms into clear and simple customer offerings. Some of Unipol’s customers have been reluctant to purchase new products and services where discounts or rewards are derived from obscure computations. Customers may be willing to accept new product formulas on the basis of trust in the short term, but market growth will depend on intelligible and transparent formulas. The overall lesson is that realizing new value depends on organizational learning and adaptation, involving many stakeholders, in a long journey in the new ecosystem.

3. Privacy Concerns Can be Offset by Personal Benefits

One of the reasons that telematics improvements and take-up have been gradual is that consumers had to become comfortable with the privacy issues. Privacy and telematics’ intrusive monitoring were a concern from the start for insurers such as Unipol. The early customers who signed up for the insurance resulted from a deliberate Unipol “pull” strategy to target “good drivers.”

Just as users of some social media sites (such as Facebook) have sacrificed some consumer privacy concerns for compelling technology-based benefits, it appears that some drivers are willing to trade off their privacy for a bundle of personal benefits that include discounts, personal safety and protection.

4. Strive for Broad Impacts: Social Value, Not Just Financial Value

Telematics information has reduced auto insurance premiums for drivers, reduced claims and fraud for the insurer, while at the same time creating social benefits—including the reduction of harmful auto emissions and the reduction of healthcare costs related to automobile accidents. Such a broad base of value creation is possible in other industries if the key players extend their ecosystem and information architecture to enable increased information sharing. In the healthcare industry, for example, a combination of electronic patient records and improved sharing across stakeholders can provide benefits to patients, hospitals and physicians, insurance companies, research institutions and governments.

Concluding Comments

The successful evolution and application of telematics in the Italian auto insurance industry provide important lessons on how to realize the broad potential of emerging information-intensive technologies. Broad benefits can be created for a large group of stakeholders, including government and citizens, if an extensive ecosystem of stakeholders is developed and supported by a cost effective information-sharing architecture. When leaders in other industries are exploring the transformative potential of emerging technologies, they should consider a broad range of ecosystem stakeholders, including technology providers, communication providers, government agencies and industry consortia.
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