

Enterprise Case Study: Building Flexible and Scalable Data Platforms

How Octo Telematics implemented a next-generation IoT and telematics platform

Publication Date: 03 November 2017

Charles Juniper



Summary

Catalyst

The use of GPS-connected telematics devices in vehicles has driven a dramatic increase in the number of insurers offering, and customers adopting, usage-based insurance (UBI) over the last five years. Now, developments in IoT technology present a further opportunity for insurers to move beyond connected vehicles and offer new insurance propositions in the home, commercial property, life, and other insurance lines.

As an early entrant to the telematics service provider (TSP) market, Octo Telematics has established a global market-leading position over the last decade. To further drive the IoT insurance market and build on its market position, Octo Telematics needed to develop an IoT and telematics platform with the functionality, flexibility, and scale to support the next evolution of IoT-based insurance propositions.

Ovum view

To ensure that Octo Telematics maintained its market leadership position, the decision was taken to develop a new platform that would support the next evolution of IoT-based insurance propositions. Octo Telematics called this the Next Generation Platform (NGP). To deliver the NGP, Octo Telematics adopted an unusual co-innovation model, working with key technology partners including Cloudera, SAP, SAS, and others. Octo Telematics' critical role within the partnership was to leverage more than a decade of experience in the UBI insurance space to articulate its vision of a platform that could support the evolving needs of a nascent IoT-based insurance market.

This approach delivered a highly functional, flexible, and scalable platform capable of responding to the emerging needs of the insurance industry and supporting Octo Telematics in the execution of its business growth strategy.

The bringing together of joint innovation and development roadmaps across a group of key technology partners resulted in the NGP being realized in a timescale and at a cost that would have been unfeasible if Octo Telematics had attempted this as an in-house, proprietary initiative.

The resulting NGP enables Octo Telematics to store, process, and analyze data generated by over 5.3 million drivers totaling 175 billion driven miles, and that increases by over 11 billion additional data points daily.

Key messages

- A "scale out" hardware approach (i.e., the use of commodity on-premises and cloud-based hardware) offers a way to deliver flexible and scalable data management analytics infrastructure.
- An advanced analytics and machine learning platform built on open source technologies such as the Apache Hadoop ecosystem provides the key application tools needed to allow most organizations to implement and fully leverage IoT-sourced data.
- A co-innovation implementation model, working with key partners, offers an approach to delivering complex IT projects within a shortened timescale and with less operational risk.

Recommendations for the insurance industry

Project owners must define a clear vision

As the instigator of a business-critical and often complex project, the project owner (Octo Telematics in this case) must articulate a clearly defined vision of the project's ultimate end goal. This can be a complex task and take time to accomplish, but it is a vital stage and critical to the overall success of a project. In addition, this end vision must have the explicit and very visible commitment of senior executives within the project-owner organization. Octo Telematics' significant experience and focus on the insurance sector meant it was ideally placed to understand and define the functional requirements of a platform to support as yet unfulfilled and evolving customer needs. However, even with this insight, it took Octo Telematics several months to clarify the final scope of the NGP.

Openness and trust among co-innovation partners is critical

Adopting a co-innovation approach to implementing a project such as the Octo Telematics NGP requires a strong cooperative working ethos among all the partners, with the willingness to operate in this way being a key factor in the success of a project. Co-innovation requires a level of openness and trust among partners, particularly around future business strategy, internal development plans, and the commitment of resources.

For the project owner, evidence of a willingness to work in this way is a key evaluation criteria when identifying potential partners and can be as important as their technical capabilities.

Leverage each co-innovation partner's core capabilities

To maximize the chances of a successful implementation and minimize development time and project risk, project owners must leverage each partner's core strengths and capabilities. Project owners in particular must be aware of undertaking project areas for which they are not the best choice and for which a partner is better suited. This choice can become clouded, especially when implementing elements that are perceived as a source of competitive advantage or unique IP.

While Octo Telematics developed the original telematics platform that had served it well to this point, it focused on clearly defining the newly emerging functionality and requirements for the NGP. Octo Telematics then utilized partners with the most appropriate products, platforms, and skills to deliver the NGP in a timescale and at level of operational risk that would not have been achievable otherwise.

Meeting the challenge of delivering flexible and scalable data management infrastructure

Setting the business context

IoT is transforming today's insurance offering

For the first time in the industry's history, IoT offers the means for insurers to be directly connected to the assets they are insuring, whether that is a vehicle, a property, or a person. This allows insurers to understand the exact status of any insured items and potentially take action in response to an abnormal

situation, such as detecting a fire, a vehicle collision, or an abnormal heartbeat. This has the potential to reshape many of today's insurance offerings and to fundamentally restructure insurance business models that have remained essentially unchanged for decades.

Established in Italy in 2002, Octo Telematics was one of the first companies to support insurers in the then embryonic vehicle telematics space. Since that time, Octo Telematics has established itself as the global leader in the telematics service provider (TSP) space and now tracks some 5 million vehicles in real time around the globe for more than 70 insurers.

Octo Telematics captures a comprehensive set of data from a vehicle, including the speed, location, and journey duration, as well as aspects of a driver's behavior, such as how harshly they accelerate or brake and how quickly they corner. The company combines this with further contextual information, such as the local weather conditions, road type, and current traffic situation, and analyzes this to provide the insurer with a detailed profile of the true risk posed by a specific driver at any particular time. This allows the insurer to calculate a premium level that accurately reflects the risk and usage to the level of the individual policyholder. This offers a massive advance over the indirect and only approximately correlated indicators, such as credit history, that are used by most of the insurance industry today.

One of the major advances offered by telematics is the ability to detect and respond to crash and claim incidents in real time, and to react in the most appropriate way, whether that is to alert the emergency services or dispatch roadside assistance.

The telematics data captured during a claim incident (such as exact location, time, speed, and the direction and magnitude of impact) also provides insurers with a detailed and accurate view of a claim, enabling decisions about liability, the likelihood of fraud, and estimated cost of repair to be made in a fraction of the time. With claims expenses typically accounting for between 70% and 80% of an insurer's costs, effective use of telematics can have a significant effect on an insurer's profitability as well as dramatically improving the customer's experience of the whole process, which in turn is a major determinant of customer retention.

The existing platform was constraining Octo Telematics' growth ambitions

Octo Telematics had developed a proprietary telematics platform that had evolved over the last 15 years of serving the insurance sector. However, with the growth of IoT and an order of magnitude increase in the number and types of connected sensors, Octo Telematics foresaw that the current platform would become an increasing constraint on the company's growth ambitions.

The challenges Octo Telematics faced were as follows:

- The existing platform was designed around the needs of vehicle telematics and could not easily accommodate other types of sensors, such as wearables, smart watches, smart locks, smoke detectors, and surveillance devices, which are becoming increasingly important components in IoT insurance propositions.
- While able to support over 5 million vehicles, the platform was reaching the limits of scalability. The anticipated growth in sensors means that Octo Telematics' platform would need to monitor data from many tens of millions of connected devices in future.
- The increased number of items being monitored would also require a very significant growth in the compute and storage capability needed to support real-time analysis across many millions of sensors.

- The data captured by the platform, whether from vehicles, properties, or people, needed to be closely coupled to the incident response and claims processes if an insurer was to offer policyholders a fully integrated IoT insurance proposition. The existing platform lacked this high degree of integration.
- As the functional requirements of the platform and the development burden increased exponentially, it became increasingly apparent that Octo Telematics could not design, develop, and maintain the NGP in isolation.

Co-innovation offered the best option to deliver the NGP

Octo Telematics' strength lies in providing the services, infrastructure, and domain knowledge that allow insurers to bring telematics and IoT-based propositions to market. However, due to the scale, complexity, and criticality of the development needed to realize the NGP in a time frame that would allow Octo Telematics to capture the emerging IoT opportunity, it was decided to adopt a co-innovation development model.

This co-innovation approach called for Octo Telematics to use its understanding of the evolving insurance market to define the functional requirements of an NGP capable of supporting a broad range of new IoT-based insurance propositions. The strategy was also characterized by Octo Telematics identifying and building strong working relationships with a small number of key technology partners capable of fulfilling the technical elements required within the platform. The key technology partners in the development of the NGP were Cloudera, Software AG, Salesforce, SAS, and SAP.

Using this approach, it was possible for Octo Telematics and its partners to accelerate the design and implementation of the NGP, delivering a complex and challenging development project in under 24 months.

The role of ICT/services in solving the problem

Implementing the co-innovation strategy

In early 2015, Octo Telematics started to formulate the approach and articulate the vision for its NGP. During this phase, the company was also beginning to identify and interact with potential technology partners. This early interaction formed an important element in recognizing those partners that understood and were prepared to operate in a co-innovation way. This dialogue also allowed Octo Telematics to continue to refine and improve the architecture of the NGP with the partners' input.

The initial phase took seven months and resulted in a jointly agreed co-innovation roadmap being shared across the key partners.

Implementing the design of the NGP took 18 months of development, with an initial prelaunch version being released to key existing Octo Telematics clients at the end of 2016.

Following the beta testing phase, the full commercial version of the NGP was released in July 2017. All new Octo Telematics clients are now supported on the NGP, with a migration plan in place to move the majority of existing clients to the new platform.

Implementing the data management and analytics infrastructure

Critical to the project's success was a data management and analytics infrastructure capable of accommodating potentially orders of magnitude growth while ensuring that the data remained secure yet accessible to an array of different applications and types of users. These requirements presented a number of data management challenges in terms of flexibility, scalability, and security.

Security is the most significant business challenge for the insurance industry

Data security is a critical issue for the insurance industry; this emerged as the most significant business challenge for insurers in Ovum's 2017/18 ICT Enterprise Insights survey of nearly 500 CIOs from the insurance industry. The criticality of security is driven by the need to both meet increasingly stringent regulatory needs and ensure that insurers continue to be seen as trusted guardians of policyholders' personal data.

The critical need for security has major implications for the design of the NGP. This challenge is compounded by the sheer volume of data from connected sensors, numbering in the millions, distributed across a wide geography. The design of the NGP must ensure the total security of all inbound data, so-called "data in motion," as well as that of data within the platform residing on disk and other storage media ("data at rest").

The platform must accommodate increasing data diversity

The data management platform needs to accommodate a broad range of inbound data types depending on the source. For most in-vehicle telematics devices the inbound data is a real-time stream, whereas other sources, such as third-party weather data, will be ingested via a batch upload.

There is also significant variation in the formats of stream data depending on the application and capabilities of the sensor. This can vary from relaying a simple journey start and finish time through to detailed crash reconstruction data from units incorporating sophisticated sensors, such as six-axis accelerometers with very high sampling rates. This data diversity will increase further (potentially to include images and video streams) as the variety of connected devices continues to grow rapidly.

The platform must support tens of millions of concurrent sensors

The NGP required a data management platform with the capability to continuously scale in terms of compute power and storage as the number of attached sensors increases. The current configuration of the NGP provides the compute resources needed to support up to 20 million concurrent sensor devices, approximately four times the number in use today. However, as the number of sensors approaches this limit, it will only require the addition of further cloud-based compute and storage resources to accommodate the growth.

Cloudera Enterprise provides the data management and analytics platform for the NGP

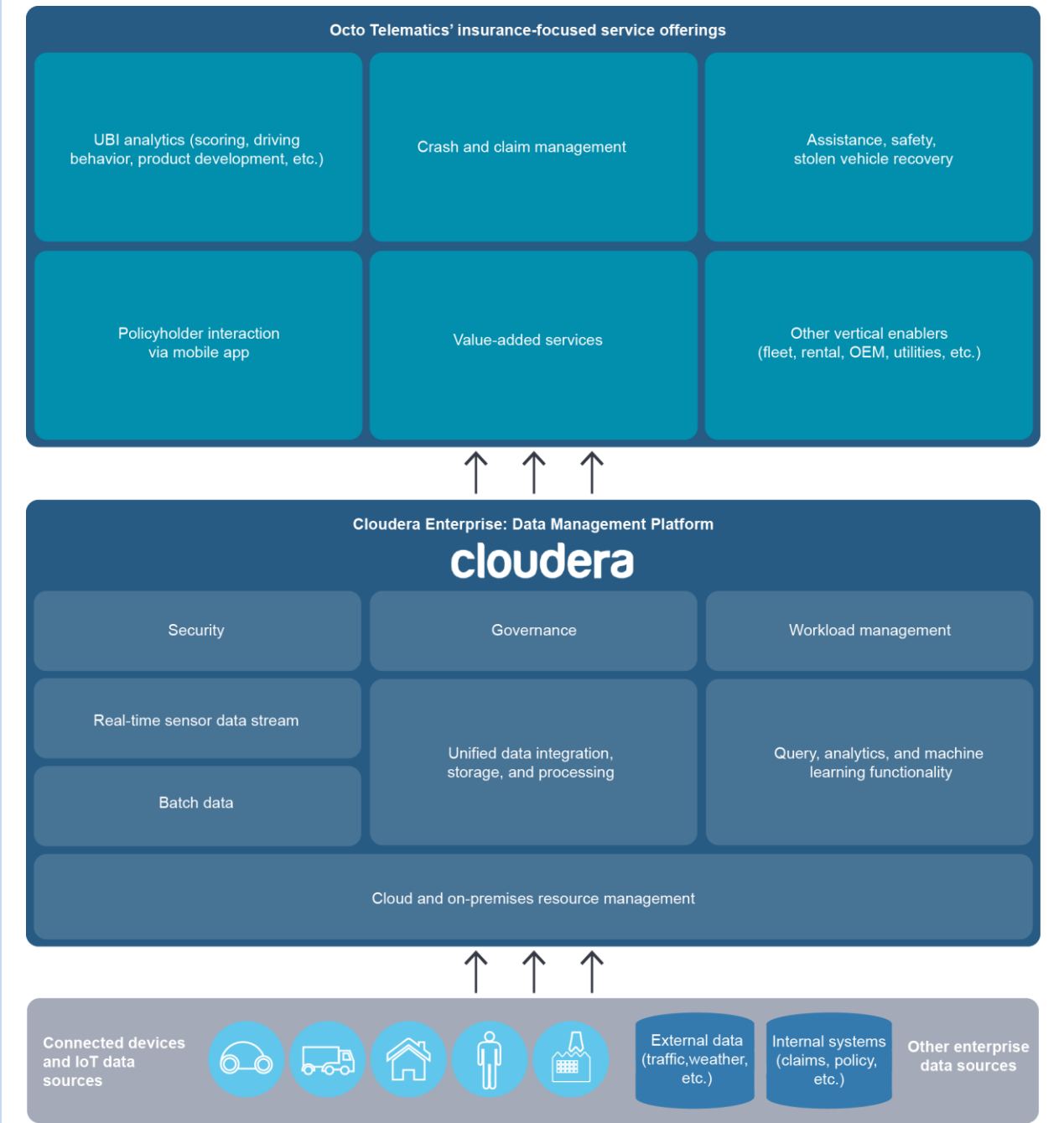
Octo Telematics selected the Cloudera Enterprise data management and analytics platform to provide this critical foundational element of the NGP. The NGP uses the Cloudera Enterprise suite at its core, which includes a set of tools to provide security, governance, and workload management functionality operating within an integrated data and platform model. The platform provides the underlying infrastructure to ingest, process, and analyze huge volumes of structured and unstructured data, while being able to perform analytics on both streaming and static data sources. The use of "scale-out" architectures such as Hadoop allows for continual expansion across multiple clusters to deliver the flexible compute capabilities required by the NGP as processing requirements vary and grow. The use of a scale-out approach rather than a "scale-up" (i.e., using expensive high-performance servers) allows this storage and compute scaling to be achieved using commodity hardware.

The NGP meets the critical security requirements by leveraging the capabilities of the Cloudera Enterprise platform. This includes encryption of all inbound data, data moving between multiple clusters, and data stored within the platform. The NGP also utilizes Cloudera's Shared Data Experience (SDX) module to define and enforce unified user and role-based access and security policies, as well as provide auditing capabilities at the application, cluster, and environment level.

As technology enables new types of insurance propositions to be realized, core to the NGP is the ability to quickly and flexibly analyze and model the vast amounts of data being captured to drive the development of new insurance products. To enable this, Octo Telematics is using a number of key components of the Cloudera platform. This includes Apache HBase and Apache Impala (incubating), providing the ability to analyze inbound sensor event streams. Also, using Apache Spark, Octo Telematics is able to leverage the huge volumes of data, the compute power of multiple clusters, and a resilient distributed data set (RDD) structure to quickly implement, train, and test machine learning models. These models allow Octo Telematics and its insurance customers to better understand, model, and price risk, and can form the core of new innovative insurance products.

Inherent in the Cloudera Enterprise platform's distributed computing model is the ability to operate the NGP both on-premises and across private or public cloud. The ability to flexibly use major cloud service providers such as AWS, Google Cloud Platform, and Microsoft Azure means the NGP can support transient but compute-intensive projects, such as testing new pricing algorithms or risk model development, on a usage-based commercial basis.

Figure 1: Data management architecture components of the NGP



Source: Ovum

Outcome assessment

Although the NGP has been operational for only a short time, there is evidence of the positive impact it is having for Octo Telematics and its clients:

- **New product introduction:** Octo Telematics' insurance clients are benefiting from the additional functionality of the NGP by being able to introduce new types of IoT-based insurance products. One client has introduced a property insurance product that uses a home hub (also developed by Octo Telematics) that is equipped with smoke, heat, flood, and intrusion sensors. Another insurer has introduced a pet insurance product using

IoT-based GPS tags worn by the pet. Another is piloting the use of smart watches as part of a health and life insurance offering.

- **Time to market:** The NGP is reducing time to market for new product launches by more than 50%. The time to implement a new UBI product was typically two to three months; however, with the NGP, this has been reduced to four weeks.
- **Continuous scalability:** The NGP has resolved the capacity issues of the previous platform and is now continuously scalable, and as demand increases it will only require additional cloud-based compute and storage resources to accommodate the growth. Currently, the NGP enables Octo Telematics to store and analyze data generated from over 175 billion miles driven by over 5.3 million drivers, including approximately 433,000 severe crashes. The inbuilt scalability of the NGP platform allows Octo Telematics to add over 11 billion new data points from connected vehicles daily.
- **Process efficiency and customer retention:** The enhanced functionality in areas such as CRM and incident analytics, as well as the increased capacity of the NGP, means that Octo Telematics can offer all insurance clients detailed, real-time crash reconstruction capability. This will allow users to drive significant efficiency improvement in claims processing, identify potential fraud, and enhance the customer's claims experience.

Future development of the NGP

Currently, most insurers implement UBI offerings as stand-alone projects requiring parallel core administration and claims systems. This is clearly inefficient and further complicates an often complex application landscape within many insurers. However, some core insurance software vendors are enhancing their systems to accommodate UBI and IoT-based insurance products. Octo Telematics is working with these vendors to develop a range of connectors that will allow direct integration between the NGP and an insurer's core processing systems. This direct integration will significantly reduce the cost of entry and complexity for insurers wanting to offer IoT-based products. So far, Octo Telematics has developed a connector allowing direct integration of the NGP with Guidewire's policy administration and claims suite, with further major vendor connectors in development.

One factor that has contributed to Octo Telematics' successful penetration of the TSP sector is its focus on vertical insurance functionality as an integral feature of its platform. While the insurance sector remains the primary focus for Octo Telematics, the greater flexibility and functionality of the NGP means the company can begin to extend this domain-specific functionality to other sectors with strong potential around IoT-based offerings. Although at an early stage, initial evaluation to add vertical-specific functionality to the NGP in support of a wider spectrum of industries, such as the telecoms, energy and utilities sectors, is already underway.

Appendix

Methodology

Ovum Enterprise Case Studies leverage in-depth interviews with key enterprise stakeholders as well as a review of any available documentation such as strategic planning, RFP, implementation, and program evaluation documents.

Further reading

"The growing impact of IoT in the insurance industry," IT0004-000433 (October 2015)

Insurance Telematics Market Dynamics: An Overview, IT0004-000403 (May 2015)

Ovum Decision Matrix: Selecting a Telematics Service Provider, IT0004-000412 (September 2014)

Author

Charles Juniper, Principal Analyst, Financial Services Technology

charles.juniper@ovum.com

Ovum Consulting

We hope that this analysis will help you make informed and imaginative business decisions. If you have further requirements, Ovum's consulting team may be able to help you. For more information about Ovum's consulting capabilities, please contact us directly at consulting@ovum.com.

Copyright notice and disclaimer

The contents of this product are protected by international copyright laws, database rights and other intellectual property rights. The owner of these rights is Informa Telecoms and Media Limited, our affiliates or other third party licensors. All product and company names and logos contained within or appearing on this product are the trademarks, service marks or trading names of their respective owners, including Informa Telecoms and Media Limited. This product may not be copied, reproduced, distributed or transmitted in any form or by any means without the prior permission of Informa Telecoms and Media Limited.

Whilst reasonable efforts have been made to ensure that the information and content of this product was correct as at the date of first publication, neither Informa Telecoms and Media Limited nor any person engaged or employed by Informa Telecoms and Media Limited accepts any liability for any errors, omissions or other inaccuracies. Readers should independently verify any facts and figures as no liability can be accepted in this regard - readers assume full responsibility and risk accordingly for their use of such information and content.

Any views and/or opinions expressed in this product by individual authors or contributors are their personal views and/or opinions and do not necessarily reflect the views and/or opinions of Informa Telecoms and Media Limited.

CONTACT US

www.ovum.com

askananalyst@ovum.com

INTERNATIONAL OFFICES

Beijing

Dubai

Hong Kong

Hyderabad

Johannesburg

London

Melbourne

New York

San Francisco

Sao Paulo

Tokyo

