How to build an IoT&Data Platform for transforming the insurance industry with connected cars

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Abstract— **The Systems Engineering approach and practices have been key success factors for developing Telematic Hub for Insurance Industry as a real solution for production helping to meet customer specific requirements since the first provided input. Telematic Hub aims to leverage data coming from possible existing motor solutions and to extend/expand telematic capabilities in order to easily respond and adapt to insurance industry business model changes. This innovative solution offers full support for three logical layers: Connected Devices, IoT Analytics and Big Data.**

Systems Engineering adopted practices will be discussed for developing the Telematic Hub solution going from concept to production and operation.

I. INTRODUCTION

In Insurance Industry, Telematics is a "game changer" for car insurance business: it adds value along the whole value chain from customer acquisition through to pricing and claims management. This helps Insurance companies to understand the need to revise product strategy, implementing large IoT programs in order to recover Revenue with new telematics-based product and to reduce risk costs for Claims and Crashes.

Insurers in Europe have experienced fraud on an increasing scale in their claims processing over recent years. Insurance Europe, the European (re)insurance federation, estimates that the total from all cases of fraud – both detected and undetected – amounts to 10 percent of overall claims expenditure in Europe. In Italy, the issue is particularly bad. Unorganized and professional fraud is one of the reasons why Italy's motor insurance premiums have risen to the highest levels in the EU (about 2-3 times higher than in France). This problem is even worst in southern regions of Italy where insurance frauds and tariffs are typically higher. Italy's politicians have picked up on the topic and have demanded countermeasures from the insurance industry. The Italian government set a requirement for motor insurers to install telematics devices in all vehicles and use the data to help set premiums.

So, Insurance Companies in the past few years started to invest heavily in installing black boxes (OBU devices) in insured cars to track vehicles and be immediately informed about car accident events. Soon, Insurance Companies have been collecting a huge amount of data with the imperative need to analyze raw data for building and improving over the time their own algorithms.

II. OBJECTIVES

In order to achieve their aim of becoming more effective at-risk selection and more efficient at handling claims, Insurance Companies needed more sophisticated techniques to analyze data. Through the black boxes installed in the vehicles and the IBM IoT and Analytics Platform, an Insurance company can collect data like:

- The GPS position of the car;
- Driver behavior during regular trips (driver profiling);
- Specific events (e.g. to understand the dynamics of car accidents);

These elements were being measured for two key reasons: (1) to limit the number of false claims and (2) to understand the dynamics of accidents (in attempt to predict and prevent).

The adoption of SE Lifecyle and SE practices allowed the development team to meet customer objectives, short time delivery requirement and budget fully achieving all required functionalities implemented in the final Telematic Hub solution.

III. APPROACH

Setting up a brand new telematic platform is a complex work. Even with appropriate investments it is very difficult to quickly implement a brand new Telematic platform. Since every system lifecycle consists of multiple aspects, including business, budget and technical ones, the systems engineer has to create technical solutions that are consistent with the business case and funding constrains. Having fully adopted the SE Lifecycle Stages for this project, during the Concept Stage all the available documents in terms of RFIs, RFPs and market analysis had been collected in order to properly shape the high

level customer requirements set while characterizing the solution space with a very early conceptual architecture. The Concept Stage was crucial for refining the stakeholder needs as well as selecting the proper technology for supporting the solution. For example, by utilizing IBM's Connected Vehicle Insight cloud managed service, the System Engineers were able to quickly identify the appropriate solution architecture for building the brand new telematic Platform leveraging out of the box capabilities including map matching, trajectory data management and analytics, driver behavior analytics, driving context analysis, mobility footprint profiling, trajectory pattern analysis, map event pattern analysis, real-time and dynamic map context management and map topology fencing.

All the data engineered during the Concept Stage allowed the Systems Engineers to make the decision about the proper lifecycle approach to be adopted for the Development Stage. During this stage the development team was focusing on several activities about:

- Functional and non-Functional requirements;
- Use Cases;
- Context;
- Interfaces;
- Component Model;
- Operational Model;
- Service Model;

HIGH Level - Context diagram
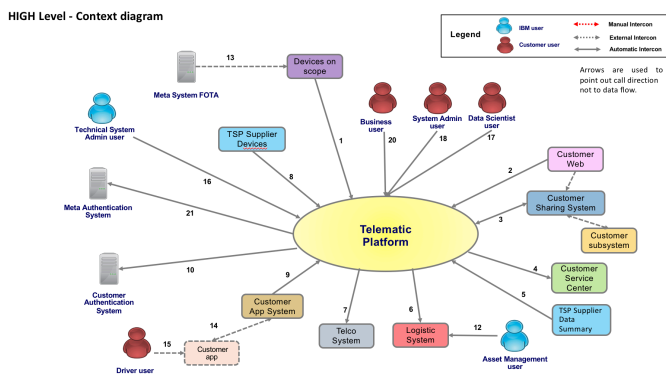
The key gate for the Production Stage was the dynamic test performed directly with the customer to verify the correct behaviour of all the application compared to the business needs and stakeholder requirements, activity typically named UAT (User Acceptance Test). The system went live for the Utilization Stage exactly after 9 months from the kick-off date of Development Stage in perfect line with the project plan milestones.

IV. CONCLUSIONS

Today the Telematic Hub solution is in Support Stage according to a continuous improvement approach. Through obtaining data ownership, Insurance Companies adopted IBM Telematic Hub solution are able to understand how to improve the quality of Telematic data of trips and crashes with single GPS point. They identify driver behaviors clustering driving styles. This creates the foundation for Insurance clients to meet their goal of achieving more effective fraud detection. The online detection of vehicle position (in the case of car crash) also allows Insurance Companies running Telematic Hub to quickly react to first notification of loss, putting in place a stronger anti-fraud system and a better risk selection. Additionally, the IBM Team have been able to build a component architecture designed around Connected Vehicle Insight SaaS, so Telematic Hub solution can today leverage Driver Insight provided analytics to build new analytics on top of them. Those new analytics will ensure Insurance Companies running Telematic Hub competitive advantage while leveraging IBM technology covering all basic needs like:

- Support for specific devices designed for insurance case;
- Logistic services with body-shops covering all regions and provinces (Italy);
- Mobile connectivity services;
- IoT Platform services;
- Data Platform services and Infrastructure services;

The Systems Engineering approach and practices have been key success factors for developing Telematic Hub for Insurance Industry as a real solution for production helping to meet customer specific requirements since the first provided input and for fully addressing the following nowadays main Insurance Industry needs:

- Lower claim frequency and average claim paid
- Become stronger at fighting fraud and better at-risk selection

This led to a development project for implementing the required basic services: New telematic contracts, Voucher management, data lake service, analytics services, integrated management services, device management services, logistic management services, call center.

REFERENCES

[1] INCOSE, "Systems Engineering Handbook, A Guide For System Life Cycle Processes And Activities", Fourth edition, INCOSE-TP-2003- 002-04, 2015.

[2] ISO/IEC/IEEE 29148 - Systems and software engineering — Life cycle processes — Requirements engineering.

[3] ISO/IEC/IEEE 15288 - Systems and software engineering - System life cycle processes.

[4] Falcone, A., Garro, A., and Tundis, A. (2014, September). Modeling and simulation for the performance evaluation of the on-board communication system of a metro train. In 13th International Conference on Modeling and Applied Simulation, MAS 2014 (pp. 20-29).