**Story**

TNO has a mission to connect people and knowledge in order to create innovations that boost the sustainable competitive strength of industry and well-being of society. In the department of integrated vehicle safety / Cooperative vehicle systems (CVS) this mission is focused on accident avoidance and is realized with efforts towards the creation of a centralized safety awareness platform. Having in the back of their mind the ultimate goal of zero fatalities and fully automated driving TNO with the help of TU/e created a first basic version of such a platform in 2013. Nevertheless, the ever-changing automotive environment soon revealed the imperative need for further improvement. The new main goal was to deal with the increased amount of data based on the increased number of vehicle sensors. This goal was based on four major pillars: improve iVSP logging capabilities, exchange data with SpeedGoat platform, replay logged data and last but not least improve the data visualization capabilities.

The solution was to investigate in depth the limited architecture of the legacy system and improve it in order to be more extendible leading to a new tool, iVSP 2.0. For the first pillar, flat files were chosen as an alternative form of data storage instead of a common database resulting in 100 times more data potentially stored. For the second and the third pillar multi-threading was introduced in order to facilitate bidirectional communication and finally for the fourth Rviz tool was extended and combined with an android app supporting plug and play sensors and visualizers.
Challenges
The huge amount of log data produced by the constantly increasing amount of sensors in a vehicle is a major challenge that automotive industry tries to tackle these days. TNO with the collaboration of TU/e developed, the Intelligent Vehicle Safety Platform, a legacy system as a starting point. This starting point lacked flexibility and was not so generic, that is why in 2015 there was an imperative need to improve the existing system in three ways by logging, replaying and visualizing the data. The biggest challenge was to log all the data, considering that every 10 minutes of driving 1GB of data was produced, by each of the radars.

Results
Despite the diversity of the group (ASD & ST) all the major goals were achieved. The basis of the solution (iVSP 2.0) was the usage of flat files (in binary format) as a form of data storage instead of a common database. That was the conclusion after numerous tests with different technologies. Additionally, an extendable tool was delivered which can visualize data online (while driving) and offline (replaying), using interchangeably a laptop and a tablet.

Benefits
This project served as a proof of concept that the increased amount of log data in a vehicle can be handled efficiently. Quite a few improvements provided to the legacy system and much more recommendations. Potentially 100 times more data were able to be processed, a bidirectional communication between the system and speedgoat (real-time target machine) was achieved and finally the real world (object) changes were quite accurately visualized in real time.

This project was executed by generation C2014 in collaboration with same generation of PDEng ASD in March 2015