Facilitating Virtual Testing at an Industrial Level by Simulation Data Management

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From an industrial or productive standpoint, the scale of simulation models, the number of involved simulation model components, and the complexity of the utilized processes with a vast amount of data are at a level that is challenging to manage manually. The introduction of virtual testing adds to the complexity of the development process and the quantity of data to be handled. Consequently, the use of an SDM system for this purpose can be advantageous in numerous ways.
The introduction of virtual testing can be accomplished in several steps. The initial step is the automation of data preparation, encompassing both input data and produced result data for both the OEM and the testing authority. Subsequent steps involve the implementation of individual processes and security mechanisms against data manipulation. This paper/presentation primarily addresses the initial step and outlines a methodology for achieving the objective of safeguarding against data manipulation and intellectual property (IP) infringement by OEMs.
An automated process has been implemented to enable virtual testing for LS-DYNA FEM models managed in an SDM system. The goal of this process is to automatically hash individual model parts each time the CAE engineer runs a simulation and to preserve this information (the hashes). This information is used as part of the automatic report generation from the results and serves as an identification for model validation by the testing authority and later also for the OEM for further model development. The objective is to automate the hashing and consistent management of the hashes, as well as to automatically generate the reports. This additional process should not add any significant workload to the CAE engineer. Furthermore, the required ISO-MME data necessary for submission to the Euro-NCAP web portal will be created automatically, thus making it as simple as possible to follow the required procedures. This essential requirement can be met by utilizing an SDM system to oversee both the FEM model data and the methodologies employed in its development, and to automate the entire process.
With such a process in place, it is possible to argue that it can be easily manipulated. Consequently, all the potential process steps that could facilitate such data manipulation must be safeguarded against such manipulation. This will be the focus of further investigations and the development of the implemented process.