KRONE

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With artificial intelligence against trailer breakdowns

Krone participates in the 'value chAIn' research Project Under the project title "value chAIn", Krone is currently using artificial intelligence (AI) to analyse optimisation possibilities with regard to product and process quality, performance and availability. In view of the research goal of error management across the value chain, the Krone project team has defined four concrete use cases. A study is being conducted regarding production in Lübtheen, where the Krone Cool Liners are manufactured. In terms of "predictive quality", the aim is to predict product quality in production on the basis of observable input variables such as plant parameters or environmental conditions. In this way, expected defects can be detected at an early stage and counteracted by optimising the process parameters. The second use case is about the error management of quality assurance in Werlte. "With the help of artificial intelligence (AI), we are setting up a sensitive early warning system in the areas of defect management and complaints. This means that all complaint data is recorded and algorithms are calculated for example whether so-called defect peaks occur in a product or in a component. These are significant accumulations of defects. If the suspicion of a possible problem is confirmed, the product specialists will take a close look at the problem and decide on the further course of action," explains project manager Felix Bartels from the Krone Business Center and emphasises: "value chAIn provides the analysis tools and derives a recommendation for action for the employees in the specialist departments from the data. The goal is to develop a decision support system. However, the decision-making authority always remains with the employees. They are the only ones who can place the recommended action in the technical or economic context and evaluate it accordingly. **In smart foresight**

The other two use cases focus on the Krone Telematics Box. An analysis is being conducted to determine the extent to which the collected telematics data can be used for further digital services. "We are questioning the digital services of the Telematics Box and checking whether, for example, the report data can be presented in a clearer and simpler way. In addition, we would like to develop further useful features based on the telematics data that make the transport of goods from A to B even more transparent. For example, the recording of abrupt braking or strong vibrations of the vehicle due to bad

road conditions, which could possibly have an effect on the quality of the transported goods, would be conceivable here. It would also be conceivable to display the specific CO2 score for a transport route. This is becoming increasingly important, especially when considering sustainability aspects," Felix Bartels reports. And last but not least, Krone has been focusing on the topic of "predictive maintenance" for several years now. "The main issue here is to proactively minimise possible trailer downtimes. If the AI warns, for example, that a wearing part is very likely to fail within a foreseeable period of time, this part could be replaced directly at the next opportunity as part of an already planned maintenance," explains Felix Bartels. **About value chAIn**

A total of 15 employees have been working on the value chAIn project at Krone since August 2021. Project participants are from the commercial vehicle factories Krone and Brüggen, from Krone Fleet as well as Datineo. The research project, which is funded by the Federal Ministry of Economics and Climate Protection (BMWK) as part of the "New Vehicle and System Technologies" programme, is scheduled to run for a total of three years. As consortium leader, Krone is coordinating its work in this context with the Machine Tool Laboratory WZL at RWTH Aachen University, the Fraunhofer Institute for Production Technology IPT and with the companies MAN Truck & Bus SE, i2solutions GmbH, DATAbility GmbH and IconPro GmbH.

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