



Research School for Operations
Management and Logistics

Predictive Maintenance for Agricultural Hightech Equipment

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The aim of the project is to develop a dynamic maintenance concept, including predictive maintenance based on IoT for large multi-state systems consisting of multiple heterogeneous components. Within the scope of the project, agricultural high-tech equipment like manure collector and milk robots will be studied. Thanks to both IoT developments and sensor technology, it is possible to monitor critical components remotely and continuously. Gathering condition data continuously offers insights into component degradation and enables predictions on the remaining useful life of components. In the project, the modeling of degradation processes, the investment to monitor these processes, and the clustering of maintenance actions such that the number of service engineer visits is kept at a reasonable level will be investigated. The considered objectives are to maximize the availability of the system and to minimize the expected total maintenance cost and output performance. The maintenance concept is dynamic in two aspects. The first is that the maintenance interval is updated as new information regarding the system state becomes available in the short term. The second dynamics that the clustering of maintenance to coordinate maintenance activities at the system level is updated at each decision time. Consequently, we aim to obtain a generic optimal maintenance concept that is applicable to a variety of machines. Next to this, it will be investigated how the generic maintenance concept can be individualized by incorporating dynamic influencers such as customer preference, external circumstances, machine usage, and service center characteristics.