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Enhanced User Guidance on Packaging Machines

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A machine's performance in the production sector is measured based on the achieved output. Thus, downtimes have to be avoided to reach maximum overall equipment effectiveness. This project analyzes and assesses Industry 4.0 - approaches to increase this effectiveness of the industrial partner's machines. The machines offer different setups, allowing handling of various input goods. As part of the thesis, a workshop has been held to identify measures to increase effectiveness. As a result, the workshop identified that incorrect setups carried out by the operator lead to downtimes due to erroneous machine behavior.

In a next step, this led to the design of a system, which enables innovative operator guidance. Thus, the system avoids handling errors and validates machine setups. As a result, the machine control can disable critical tasks in case of incorrect setup. Low-power sensors allow an autonomous checking of the setup. A wireless interface ensures data transmission to a centralized station.

The developed system was tested under laboratory conditions and validated in machine environment. Especially the latter situation yielded a proof of concept in an operational production site. In both environments, the deployed system did deliver reliable and promising results, proving that the concept is appropriate to solve the given problem.

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