

RobIN4.0

Resilience through integration, interaction, interpretation and intelligence

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Department	Process Chains and Forming Units
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Abstract

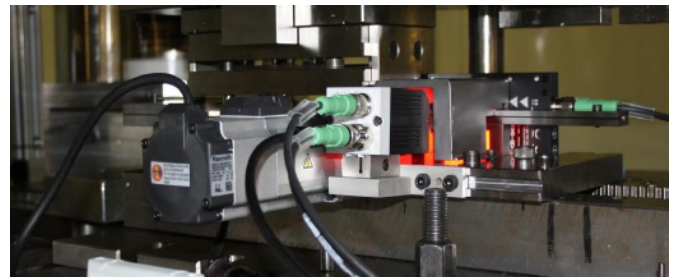
In the RobIN 4.0 collaborative project, informational streams were set up parallel to the productive material streams in forming technology in order to increase process robustness, production reliability and productivity across different processes. The four major topics of the project are the integration of sensors to create a robust sensor network, the interpretation of sensor data to perceive the process environment, the interaction between CPS to increase process robustness and intelligence by combining and testing the overall CPS system

Project description

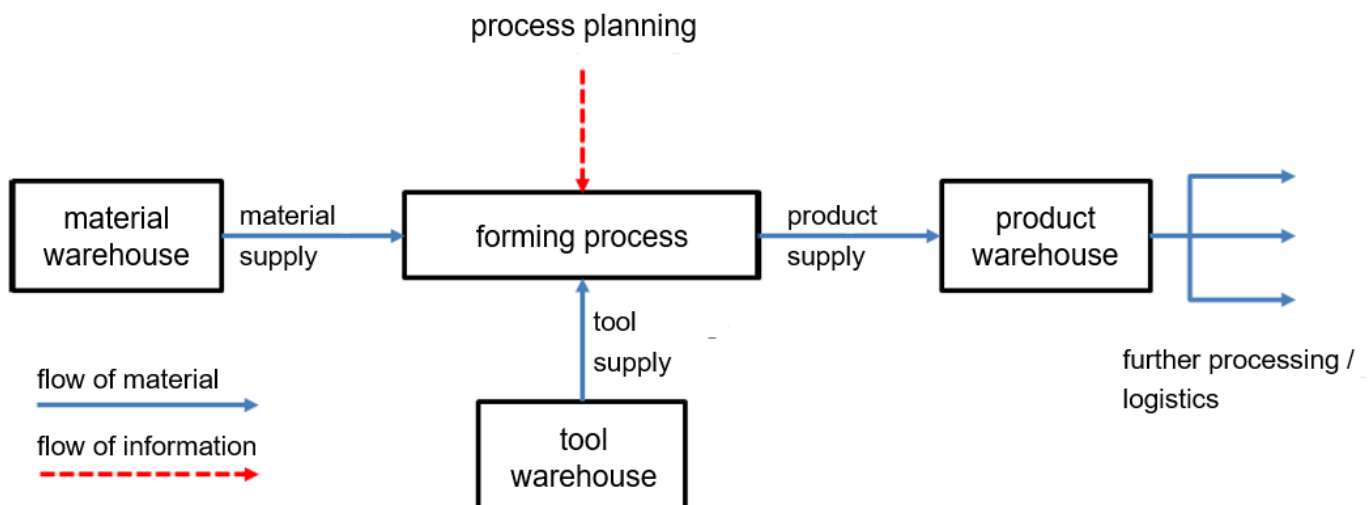
Forming processes are among the industrial production methods that enable the manufacture of high-quality products in large quantities. In order to maintain this productivity in the future, it is necessary to embed the stream of information in the internal material stream. For this purpose, informational streams were established parallel to the productive material flows in the forming companies within the scope of the project. (Figure 1). This resulted in improved process robustness and production reliability and increased productivity across all processes.

Results

In order to demonstrate the potential of an extension of information streams in production, the project advanced the prototypical implementation using different forming processes. As no robust, cost-effective and universally applicable sensor technology was available before the project started, integrated sensor systems were developed. In addition, new ways of signal interpretation were taken in order to open up the potential of decentralized intelligence in production in connection with the process-specific control systems to be developed. The final result was a demonstration process chain, in which both the possibility of process control and the possibility of adapting the upstream and downstream processes is given.



[2] Process chain Stamping-Bending with integrated sensors (camera right) and actuators (stall drive left)



[1] Material and informational streams in a common forming production

Acknowledgement

The results of this research project were achieved within the framework of the funding measure „Intelligente Vernetzung in der Produktion - Ein Beitrag zum Zukunftsprojekt Industrie 4.0“, provided by the Federal Ministry of Education and Research (BMBF) within the funded project „Resilience through integration, interaction, interpretation and intelligence - RobIN 4.0“. Special thanks go to the consortium for the technical support during the project.

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