

**Project title:** AutoNoM – Automated model building and analysis of the nonwoven-production using machine learning

**Partner:** atlan-tec Systems GmbH, Willich  
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### Mission Statement

Machine learning is an effective method to make the production of many goods more stable and economical. The main deficits of machine learning methods are the time-consuming selection and training of a suitable model and the lack of robustness due to poor data quality or overfitting. Machine learning methods are therefore paradoxically not accepted, especially not in those industries where the effects of raw material properties, production settings and environmental conditions on the produced product quality are highly complex. The potential of machine learning in those industries is therefore particularly high. This is particularly the case in the production of high-quality, technical textiles in medium-sized companies. In the textile industry, the produced quality also fluctuates due to the manual, experience-based adjustment of the production machines.

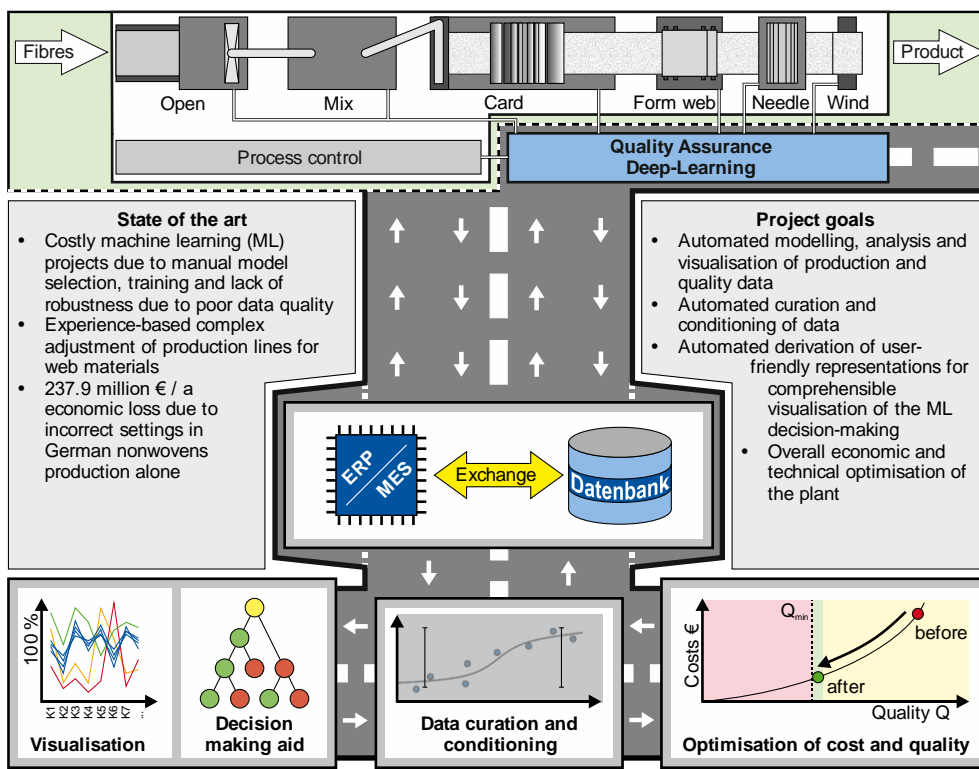
The presented research project solves core problems of the automated analysis of production and quality data by means of machine learning in the production of meter goods. The implementation is carried out using the example of the production of nonwovens, from the fibre bale to the finished nonwoven. The aim is to automatically bring together, cure and condition the production and quality data of the nonwovens production by means of machine learning and to optimise the production technically and economically.

When the project is implemented, a scrap reduction of 20 % is expected. For the German nonwovens industry alone this corresponds to an annual production increase of € 47.6 million per year.

### Approach

The approach to achieving the objective is the automated curation and conditioning of the aggregated data with the help of the guideline developed by the VDI/VDE/GMA Guideline Committee 7.24. The automated curation and conditioning of the data ensures that only causally correct data sets of sufficient quality are used for modelling, so that the robustness of the procedures increases enormously. At the end of the project, the procedure can be transferred to other web materials such as woven, knitted and warp-knitted fabrics, paper, glass and foils.

Furthermore, the implementation of the project will greatly accelerate the initial production optimisation of new products. Due to the change away from mass products to ever smaller batch sizes, production optimisation in the initial phase of new products is extremely difficult, as it is no longer possible to work continuously over several days at a stretch on product optimisation. The reason for this is that customers demand ever smaller batch sizes: Very rarely is a product produced continuously for more than one shift. Therefore, particularly in the start-up phase of a new product, a lot of information is lost due to the discontinuous learning process of the employees. For a medium-sized and innovative producer such as the project partner BNP Brinkmann with a turnover of € 22 million p.a., this corresponds to additional annual costs of around € 275,000. The high annual costs translate to an additional high savings potential.



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