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AI IN TEXTILES: IT'S NOT THE ALGORITHM, IT'S THE DATA AND SKILLS



A new ITMF and ITA white paper calls for collective action to make artificial intelligence useful and trusted across the textile value chain by 2030.

Imagine a textile factory where machines can identify fabric defects, anticipate equipment failures and help manufacturers optimise energy use. Artificial Intelligence (AI) is already making these possibilities a reality across parts of the textile value chain. Yet a new industry study makes one point clear: the greatest barriers to adoption are not the

algorithms themselves, but fragmented data, skills shortages and gaps in governance.

The white paper, “AI in the Textile Value Chain: A Strategic Guide to Artificial Intelligence for the Global Textile Industry”, was published jointly by the International Textile Manufacturers Federation (ITMF) and the Institut für Textiltechnik (ITA) of RWTH Aachen University. The study describes the sector as “not under-digitalised, but digitally fragmented”. Decades of digitalisation have generated substantial data, but many systems remain disconnected and much of the information is not available in a usable, structured form.

AI is already delivering measurable value in well-defined applications, including computer-vision inspection of fabrics and yarns, predictive maintenance, energy optimisation and demand forecasting. The white paper cites an example from a nonwovens production line where causal AI reduced scrap by 10%—a practical demonstration of how intelligent systems can improve manufacturing performance.

The study also points to a new phase in AI adoption. Systems are beginning to move beyond decision support towards coordinating multi-step processes, while causal AI is starting to adjust production settings under human supervision. The authors estimate that end-to-end AI workflows could become realistic within two to three years.

However, progress depends on trust. Companies need control over sensitive data, strong cybersecurity, transparency about system limitations and clear human accountability. The white paper recommends investing in people before scaling technology, treating data as shared infrastructure and beginning with focused, well-defined use cases.

Industry associations and collaboration will be especially important in helping small and medium-sized enterprises participate in this transformation. Shared data standards, data spaces that preserve

ownership with the data originator and sector-specific tools—such as a controlled “Textile GPT”—are among the approaches highlighted.

The message for the global textile industry is both practical and inspiring: the future will not be shaped by technology alone. It will be built by people who can combine industrial experience, digital skills, reliable data and responsible innovation. A more connected and collaborative textile sector can turn AI into a powerful force for productivity, resilience and sustainability.

KEY FINDINGS

- AI is already improving fabric and yarn inspection, predictive maintenance, energy optimisation and demand forecasting.
- Poor data integration and skills shortages are more limiting than the availability of algorithms.
- Agentic and causal AI are moving towards multi-step workflows and supervised production adjustments.
- Trust requires data control, cybersecurity, transparency and human accountability.

THE WAY FORWARD

The white paper urges textile companies to build skills, integrate data, start with bounded applications and collaborate across the industry. For SMEs in particular, shared standards and collective initiatives can help make AI adoption more accessible, practical and trustworthy.

THE OPPORTUNITY AHEAD

The future belongs not simply to those who adopt AI, but to those who use it wisely, collaboratively and responsibly. By combining human expertise with reliable data and intelligent technology, the textile industry can build a more productive, resilient and sustainable future.