TECHNOLOGY

AI in the Textile Industry: Opportunities, Challenges, and the Future of Work

Introduction

Artificial Intelligence (AI) is rapidly transforming industries worldwide, and the textile industry is no exception. In his presentation at the **ITMF & IAF Joint Conference 2024**, **Prof. Thomas Gries** from the **Institut für Textiltechnik (ITA) at RWTH Aachen University** explored the impact of AI on the global textile industry. This report summarizes his insights on how AI can revolutionize the textile sector, address the skills shortage, and shape the future of work.

The Current Skills Shortage: A Global Challenge

One of the most pressing issues across industries is the growing **skills shortage**, which is projected to worsen due to demographic changes and evolving technological demands. The textile industry is particularly vulnerable to this shortage as it relies heavily on both manual labor and technical expertise. Key factors contributing to the skills gap include:

- **Aging workforce**: As experienced employees retire, they take valuable knowledge with them, creating a gap in expertise.
- **Lack of new talent**: Many industries, including textiles, struggle to attract younger workers, leading to gaps in key areas such as AI and digitalization.

AI as a Solution to the Skills Gap

AI technology offers a solution to mitigate the effects of the skills shortage by automating repetitive tasks and enhancing productivity. Companies that fail to adopt AI technologies are at risk of becoming non-competitive by 2030, as automation becomes increasingly necessary for survival.

AI can:

1. **Automate up to 70% of repetitive tasks** in production, reducing dependency on human labor.
2. **Enhance decision-making** through data analysis, enabling companies to respond faster to market demands.
3. **Support knowledge transfer** by capturing and storing the expertise of retiring workers, ensuring that valuable information is not lost.

AI in Textile Manufacturing: Digitalization and Flexibility

The textile industry has been slow to embrace digitalization, but the integration of AI offers a pathway to improved **flexibility** and **efficiency** in production. By leveraging AI, manufacturers can speed up **time to market**, reduce waste, and improve product quality.

Key applications of AI in textiles include:

- **Predictive maintenance**: AI systems can monitor machinery performance, predict breakdowns, and optimize maintenance schedules, reducing downtime.
- **Supply chain management**: AI helps optimize inventory, track shipments, and forecast demand, leading to more efficient supply chains.
- **Customization**: AI enables the production of customized textiles on demand, meeting the growing consumer demand for personalized products.

Workforce Transformation: The Role of AI in Training and Development

The integration of AI in the textile industry also has implications for **workforce transformation**. As repetitive tasks become automated, the role of workers will shift toward more strategic and creative tasks. However, this transformation requires investment in **education and training** to equip workers with the necessary AI-related skills.

At **RWTH Aachen University**, the **National Competence Center Digital – Smart Circularity** is working on innovative AI-based training programs. These programs provide workers with real-time simulations of textile production processes, allowing them to develop new skills in a safe, controlled environment.

Conclusion: A Call to Embrace AI for a Sustainable Future

The textile industry is at a crossroads, facing both significant challenges and tremendous opportunities. **AI** offers a solution to many of the industry's current problems, from the skills shortage to the need for increased efficiency and sustainability. However, the successful adoption of AI requires **collaboration** across the supply chain, investment in **education**, and a commitment to **digital transformation**.

Prof. Thomas Gries concluded his presentation by urging industry leaders to embrace AI and invest in the future of their workforce. By doing so, the textile industry can not only survive but thrive in an increasingly competitive and automated world.