Digital Twin in the Fiber Industry – Experience from the first implementation in a Cross Laminated Timber line

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The Digital Twin concept sits at the center of digitalization, linking all models and data related to products, their production and their operational performance, and providing in real time all needed information to designers, engineers, operators and service technicians across the entire industrial life cycle.

Unlike in other manufacturing industries, the implementation of a Digital Twin in the fiber industry is rarely seen. Especially a real Digital Twin implementation, as this is by far more than “only” the generation of a Virtual Twin of the production line for training reasons. The latter has been the state of the art in the paper industry for many years already and you can find this kind of Virtual Twin simulation with Siemens SIMIT tool around the world in many pulp and paper mills.

Real Digital Twins are are already widely used outside of the fibre industry. One should specifically mention the automotive industry in this regard, with the most extensive Digital Twin concepts over the entire value chain: from design, development and virtually testing of new car models instead of real prototypes, material flows, as well as the entire manufacturing line. This means the Digital Twin is already “producing” the virtual car far ahead of the ground breaking ceremony of the real car factory, up to the ultimate goal: implementation of simulation algorithms to be computed in real time so that they can run in parallel to the manufacturing process, providing the user at any time with enhanced decision support on optimal usage by means of augmented reality and virtual sensing.

With our longtime experience of Digital Twins, Siemens and our customer — a leading and global provider of renewable solutions in packaging, biomaterials and wooden constructions — decided to pilot the Digital Twin implementation in a Cross Laminated Timber (CLT) production line via our Plant Simulation Software with the target to:

- Create a digital model of the CLT production line and simulate different production batches with the aim to understand how a digital twin can help to optimize production efficiency
- To run Bottleneck analysis and What-if scenarios
- Simulating in fast motion (annual production in seconds) changes of production parameters and their effect on the main key performance indicators (KPIs)
- Visualization of KPIs and production parameters in real time

This presentation will help to better understand the definition and distinction between Virtual / Digital Twin implementations and will show references from Digital Twins, specifically of course the first pilot implementation of a real Digital Twin in the Fiber Industry: in a CLT production line.