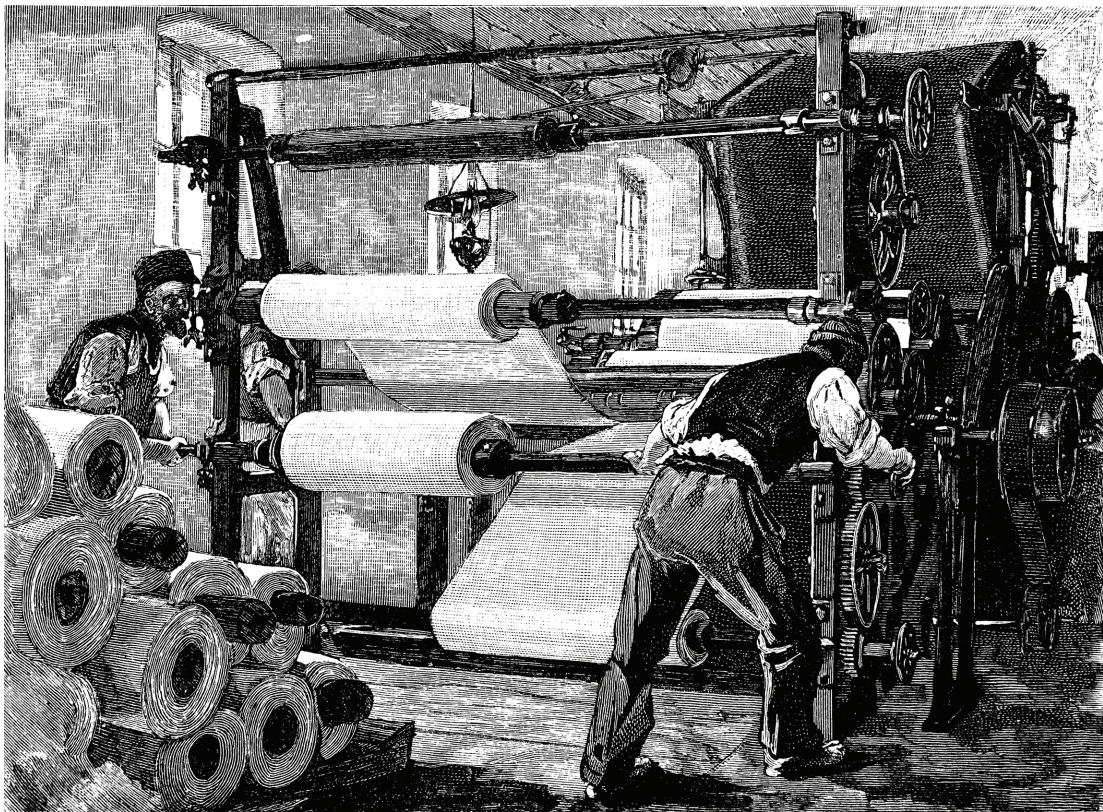


Digital Transformation: Adding a new chapter to the history of paper making

Christian Jung, T.CON GmbH & Co. KG

INTRODUCTION:

Paging through the history of paper production unveils an unprecedented story full of innovations and resilience. Given this abundance of incremental improvements over time, modern day challenges of the industry appear in a different context. A glance at the hurdles successfully taken by manufacturers throughout those many years proves that the occurrence of both disruptions and crises as such is inevitable. It is rather the reaction to them what determines the path forward. Whether the invention of groundwood pulp technology to solve rag shortages (in 1843 by Gottlob Keller) or establishing TCF as a response to chlorine-based pollution (in the late 1980s) – every epoch had its answer to seemingly untamable problems. Fast forward to the present, the key is transforming digital processes. If our current “chapter” had a title, it would be “Digitalization”. Let’s discover how it can be another success story added to the book.



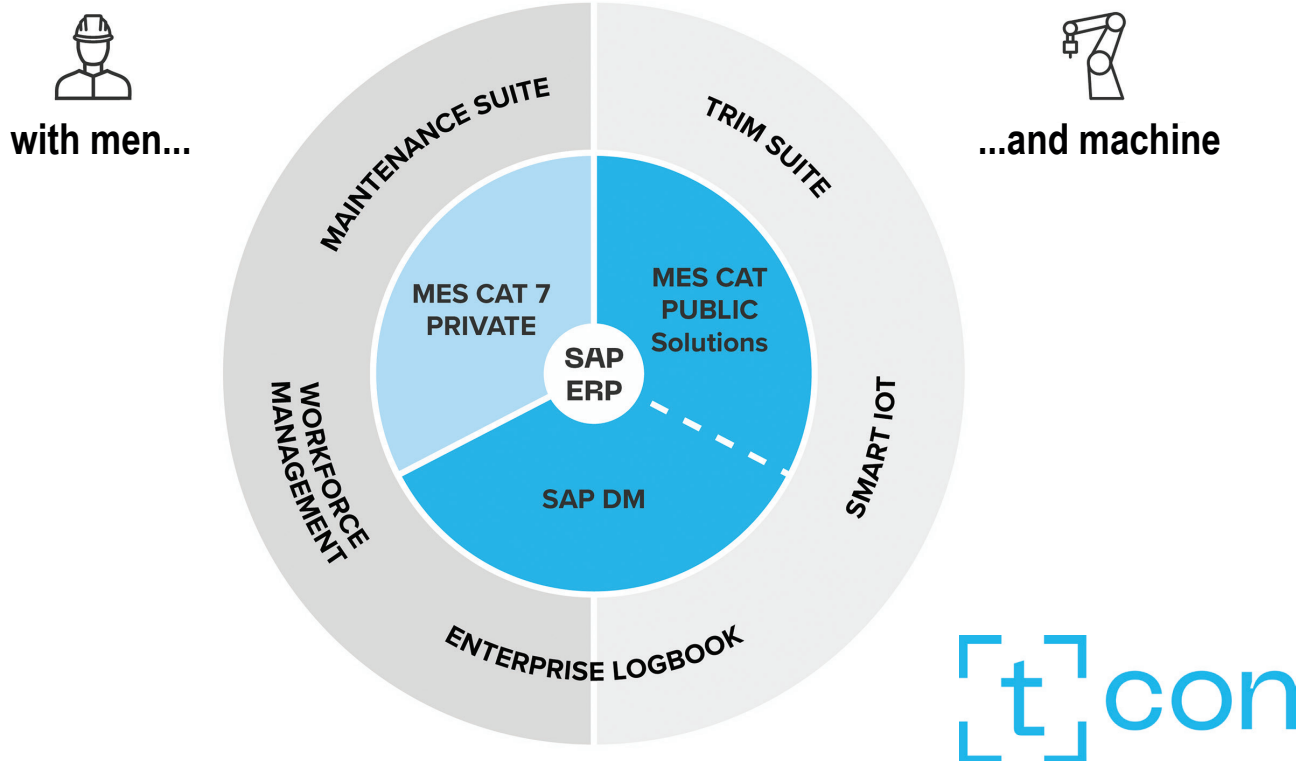
The emergence of a growing number of digital solutions has altered the velocity and magnitude of changes within the industry drastically – even when considering only the last decade or two. A trend that is only about being speeded up even more by Artificial Intelligence (AI). As digitalization itself certainly is not a completely new phenomenon, it makes sense to evaluate where the industry stands now, before assessing new approaches of embracing it.

Industry assessment: Less advanced than possible

The present level of digital maturity in the paper industry is subject of the 2025 study “Digital Transformation in the Paper Industry: Assessing Maturity, Challenges, and Opportunities” published in the journal Sustainability. Conducted by Othen, Padberg, Möbitz & Gries, it investigates both major challenges and potential benefits arising from digital transformation.

The paper is based on an in-depth survey made during the ZELLCHEMING Expo 2024 where industry experts in a broad range of positions from 24 different corporations were interrogated. Whereas a third rates themselves above the industry average, two thirds state that they are at an early stage of digitalization, i.e. on a scale from 1 to 6, the stages 1-3 apply to this group. Talking about the biggest deficits his study reveals, researcher Rosario Othen concludes: “Companies are struggling with modern approaches, dealing with legacy systems, networking them and data quantity and quality. There is also a picture of many isolated solutions, with hardly any holistic approaches. Other sectors, such as the automotive and electrical industries, are more advanced in this respect. One glimmer of hope is that at least the relevance of data as a basis for decision-making processes is being recognized.”

Comprehensive management of shop floor processes



Solid foundation: Using untapped potential

Hence, there is undoubtedly a lot of room for improvement with the implementation of digital solutions. In order to tap on their full potential the researchers recommend to adopt a gradual approach to digitalization by starting with small pilot projects before scaling up. Investing in employee training is key to driving cultural change. Collaborating with technology providers helps access innovative solutions, while strong data security measures are vital to building trust with customers and partners. According to Othen, besides sensor technology also Manufacturing Execution Systems (MES) can be the backbone for boosting competitiveness. This helps to make existing digital solutions and machinery on the shop floor better connected and data easier to access. Previous endeavors of modernizing the production can be a solid foundation for digitalization with an MES. A study by McKinsey that elaborates "Pulp, paper, and packaging in the next decade" (2019) agrees: "The industry is well placed to join the digital revolution, as paper and pulp producers typically start from a strong position when it comes to collected or collectable data."

Approaching the future with MES SUITE: Building block by building block

When examining an ideal MES, it shows that it is in fact the key building block towards digitalizing production systems that take advantage of data. The MES is the data hub linking platform data from the shop floor with data from the enterprise resource planning (ERP) system, ideally fully integrated into the other components of the company's IT. Now, is there a MES master plan that fits for everyone? Of course not. Each paper manufacturer has its unique production processes. The increasing pressure to innovate also requires flexible and cost-efficient software for digital production control. An off-the-shelf solution is therefore rarely the ideal solution. However, with the modular MES SUITE by T.CON, there is a solution that grants the flexibility needed. It interprets the aforementioned "building block" called MES not as a monolith, but rather as a collective consisting of several optional individual building blocks or modules.

The MES SUITE is a comprehensive solution that intelligently combines ERP, MES and machine integration. Robert Steindl from the Austrian specialty paper manufacturer delfortgroup AG for example appreciates that "T.CON's MES solution has met our requirements exactly. It is completely based on SAP technology and easy to handle. The solution is fully integrated into our SAP ERP system and fully maintained." Since paper producers can choose flexibly between different modules, they can organize their manufacturing processes precisely according to their individual requirements.

MES SUITE at a glance: The components in a nutshell

The T.CON solution offers a holistic approach to an encompassing management of shopfloor processes that involve both men and machine. Let's start this brief overview from what is adjacent to its core, SAP ERP:

MES CAT 7:

- The private cloud solution for maximum flexibility MES CAT 7 offers a tried-and-tested industry solution for companies that want to combine independence with state-of-the-art technology. Without sacrificing the strengths of a modern platform application, MES CAT 7 enables companies to implement the transition to digital production step by step.

MES CAT PUBLIC Solutions:

- Industry expertise in the SAP Public Cloud With over 20 years of experience in application development, T.CON brings together the best of both worlds: MES CAT PUBLIC Solutions extends SAP Digital Manufacturing (DM) with specialized functions for area-based production. The solution is modular, feature-based and therefore cost-efficient.

SAP Digital Manufacturing (DM)

- The key technology for future-orientated production on SAP BTP which in turn is a scalable platform realizing the analyzing power of AI. SAP DM seamlessly connects shop floor and top floor and integrates production planning, process monitoring and quality assurance. This helps to optimize sustainably, reduce costs and increase operational flexibility.

In addition to the core modules, the MES SUITE offers further powerful modules for the paper mill:

TRIM SUITE

- Optimizes cutting planning processes in roll and sheet production. With powerful algorithms, it enables resource-efficient planning of cutting patterns, reduces material waste, and increases production efficiency.

SMART IOT

- The cloud-based and AI-supported solution for managing, storing and analyzing industrial machine data. It lays the foundation for intelligent production decisions by linking IT and OT data in real time. With SMART IOT, companies can enhance energy efficiency, monitor CO₂ emissions, and optimize production processes based on data insights.

MAINTENANCE SUITE

- More user-friendliness for SAP PM/EAM thanks to MAINTENANCE PLANNING and MOBILE MAINTENANCE. It enables intuitive graphical scheduling, mobile order processing, and end-to-end process reliability – both online and offline. The result: reduced downtime, higher data quality, and optimized maintenance workflows.

WORKFORCE MANAGEMENT

- Simplifies shift planning on the shopfloor through a centralized, SAP-native solution. Production planners benefit from automated scheduling suggestions, skill matrix evaluations, and a clear overview of personnel resources. The solution ensures optimal machine staffing and sustainably increases the efficiency of workforce deployment.

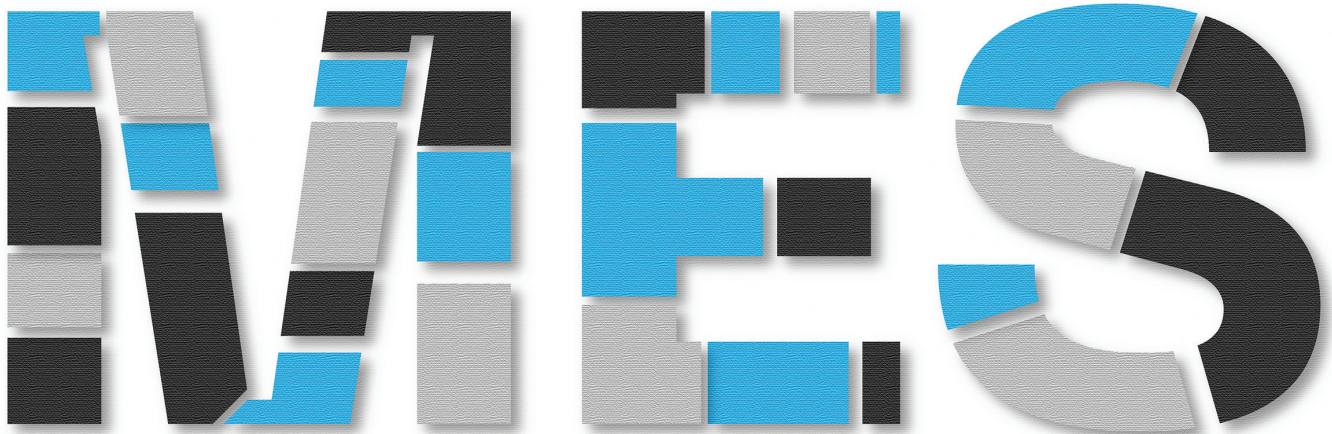
ENTERPRISE LOGBOOK:

- The central digital knowledge management tool for production environments. It provides seamless, audit-proof documentation of shift handovers, machine statuses, and events. With AI-powered search functions and seamless SAP integration, it supports efficient collaboration, improves process traceability, and fosters transparency across all production shifts.

Why T.CON?

As an SAP Gold Partner, T.CON not only offers innovative technologies, but also in-depth industry know-how and proven implementation expertise. Since 1999 clients from the paper industry and beyond not only receive software, but also a customized solution that meets their specific requirements. With its MES SUITE T.CON ensures that companies actively shape digital change and remain successful in the long term. This way, the T.CON team brings its credo "Empower your potential" to life every day.

Are you ready for the future of manufacturing? Then let's take the first step and write the chapter "Digitalization" together.

**About the author**

Christian Jung is a trained papermaker active in the ZELLCHEMING association. He has worked in sales in the paper industry for over 30 years before he entered the "digital world". Fascinated by the increasing improvements in the industry through digitalization, he has been working at T.CON for four years and consults paper manufacturers with their digitalization projects.

Get in touch:

christian.jung@team-con.de
+49 170 709 222 5



Connect on LinkedIn