

WHITE PAPER

PAPER PULP & PACKAGING

The Digital Era



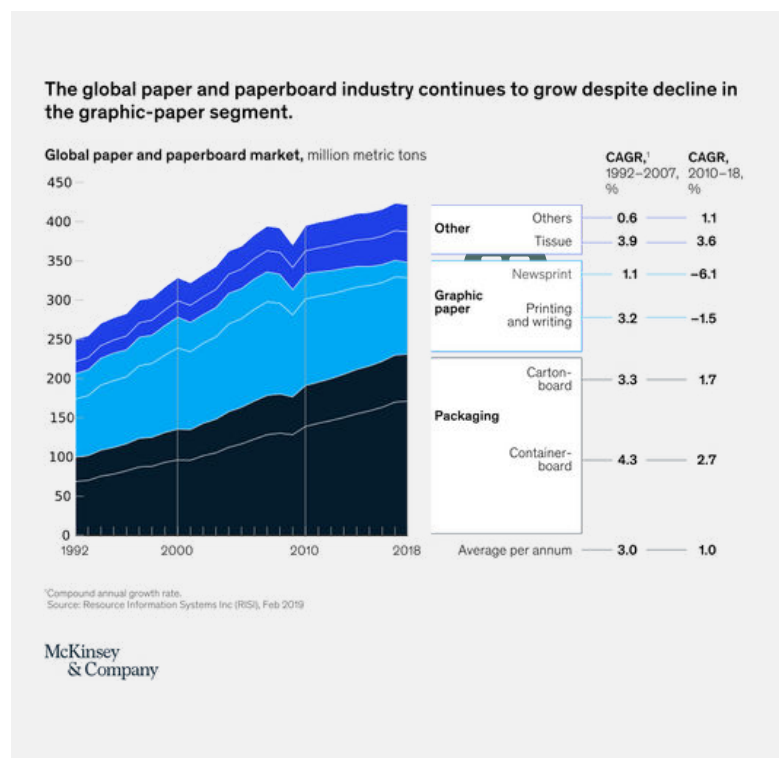
As the direct-to-consumer industry continues to grow, the packaging industry is experiencing a surge in demand. Paper manufacturing machines have been converted to packaging solutions to meet this increasing demand. Bridge Automation, an industry leader in automation, empowers manufacturing industries, including the paper industry, to embrace Industry 4.0 through its advanced artificial intelligence (AI) and deep analytics efforts.

The Changing Landscape of the Paper Industry

According to a McKinsey & Company study, the paper industry is undergoing one of the most substantial transformations in decades. While the demand for graphic paper declines, the need for packaging (both industrial and consumer) and tissue products is on the rise. This transformation presents new challenges for executives, such as material uncertainty and cost optimization.

THE FACTS

- Studies show that the industry can achieve up to 15% cost base reduction through digital manufacturing.
- Forbes reveals that approximately 70% of consumers are willing to pay more for sustainable packaging, including compostable and paper options.
- Forbes also highlights that real-time analysis of shipment data can reduce costs by up to 40%.
- The pulp and paper industry, accounting for 6% of global energy use, prioritizes controlling energy consumption for both cost and sustainability reasons.



A rough estimation shows the paper and forest-products industry has much to gain from embracing the digital revolution.

Example use cases in the paper and forest-products industry	<ul style="list-style-type: none"> Raw-material supply¹ Pulp production Paper and board production Paper machine Converting line 	Cost reduction on total cost base, estimate, %		OEE ² improvement, estimate, pp ³
		Existing technologies	Existing and future technologies	Existing technologies
Artificial intelligence and analytics	Fiber yield, chemical consumption, and energy	-4.5	-7.0	n/a
	Predictive maintenance	-2.0	-2.5	-2.0
Automation	Throughput debottlenecking and quality	n/a	n/a	-3.0
	Logistics automation	-0.5	-1.0	n/a
	Process automation	n/a	-0.5	n/a
	Remote process control	n/a	-1.5	n/a
Mobile	Remote process inspection	-1.0	-1.0	n/a
	Digital field-force apps	-1.0	-1.0	n/a
	Digital business-support functions	-0.5	-0.5	n/a
	Digital performance management	n/a	n/a	n/a
Total opportunity⁴		-10	-15	-5

¹Forestry and harvesting.
²Overall equipment effectiveness.
³Percentage points.
⁴Not including purchasing, marketing and sales.



Bridge Automation's solutions play a vital role in helping the paper industry overcome environmental standards and challenges by leveraging AI and big data.

COST OPTIMIZATION AND SUSTAINABILITY

The Power of Digital Manufacturing: Moving towards digital manufacturing allows companies in the paper industry to shift away from traditional cost reduction programs towards more agile and dynamic opportunities for cost optimization. Bridge Automation's AI-driven solutions offer significant cost-based reductions of up to 15%, as highlighted in industry statistics.

PREDICTIVE MAINTENANCE

60-80% of all equipment malfunctions on Quality Control Systems in pulp & paper mills are caused by incorrect or lack of maintenance.

Paper machine: Due to the high speed and continuous operation of paper machines, components are subjected to significant stresses and fatigue, resulting in wear and degradation over time. By utilizing motor data or installing a few select additional sensors, the status of equipment can be logged for unique plant conditions. This data can be analyzed using AI-based predictive maintenance to detect anomalies, identify subtle but dangerous trends, and alarm the staff before failures occur.

Predicting paper web breakage: Every instance of paper web breakage causes a system downtime of at least 25 minutes. By analyzing historical data on the machine and process variables such as belt tension, speed, and moisture levels, patterns can be identified. Using a machine learning model trained on this data, future web breakages can be prevented if the model detects a potential failure, greatly reducing downtime and material waste.

EQUIPMENT MONITORING AND QUALITY CONTROL

If your paper manufacturing plant is having more quality issues than you expect, the problem can be identified by performing data analysis on historical data of your equipment to address problems such as overheating, or frequent operator errors on a certain process. The Bridge Automation platform is open source and can communicate with most major data historians and databases, including OSI PI, FactoryTalk, Ignition, and others.

RAW MATERIAL MANAGEMENT

Supplier Management: AI and ML technologies analyze data on raw material quality, supplier performance, and historical variations. This empowers manufacturers to identify reliable suppliers, establish quality standards, and make data-driven decisions for sourcing raw materials.

ENVIRONMENTAL COMPLIANCE: HEALTH, SAFETY, AND ENVIRONMENTAL REGULATIONS

Emissions Monitoring and Control: AI and ML algorithms process real-time data from emission monitoring systems, identifying subtle trends and enabling early detection of potential compliance breaches. AI systems recommend adjustments to optimize emission control systems and reduce environmental impacts.

Sustainability Reporting and Transparency: AI and ML technologies automate the collection, analysis, and reporting of sustainability metrics. By integrating data from various sources, manufacturers can generate accurate sustainability reports, enhancing transparency and accountability.

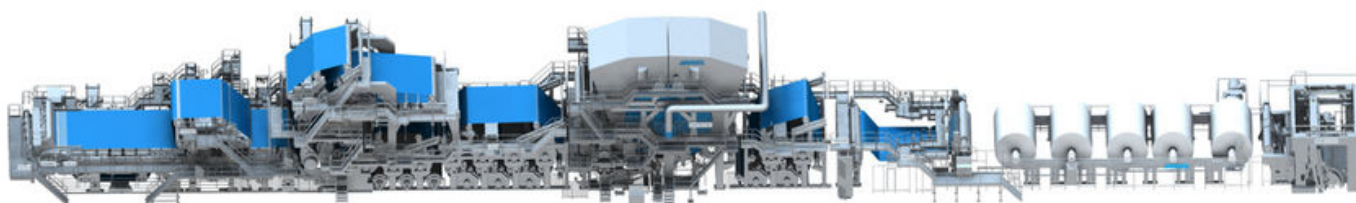
ENERGY CONSERVATION

Steam and Heat Distribution: Energy-intensive operations in the paper industry, such as heating, drying, and power generation, rely heavily on steam. Bridge Automation's AI-powered solutions optimize steam and heat usage in real-time, reducing energy consumption. Additionally, ML-based simulations and digital twin models help experiment with process optimization before implementation, reducing energy waste.

Process Inefficiencies: AI and ML identify process inefficiencies caused by suboptimal design or operational practices. By optimizing process parameters, improving integration, and reducing production waste, energy efficiency is enhanced.

Whether it's supplier management, demand forecasting, emissions monitoring, sustainability reporting, energy consumption optimization, or water usage management, we have the expertise and technology to provide innovative solutions. We encourage you to reach out to discuss the specific concerns and challenges faced by your manufacturing plant. Our team is ready to assess your requirements and develop tailored solutions that align with your goals.

Contact us to embark on this journey toward a more sustainable and technologically advanced future.



References

McKinsey & Company. Pulp, paper, and packaging in the next decade: Transformational change.
Industrial Access Inc. Preventative maintenance for pulp & paper mills. Retrieved from

"STUDIES SHOW
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-MCKINSEY & COMPANY

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BRIDGE AUTOMATION

Bridge Automation LLC

Greenville, South Carolina

info@bridgedata.tech