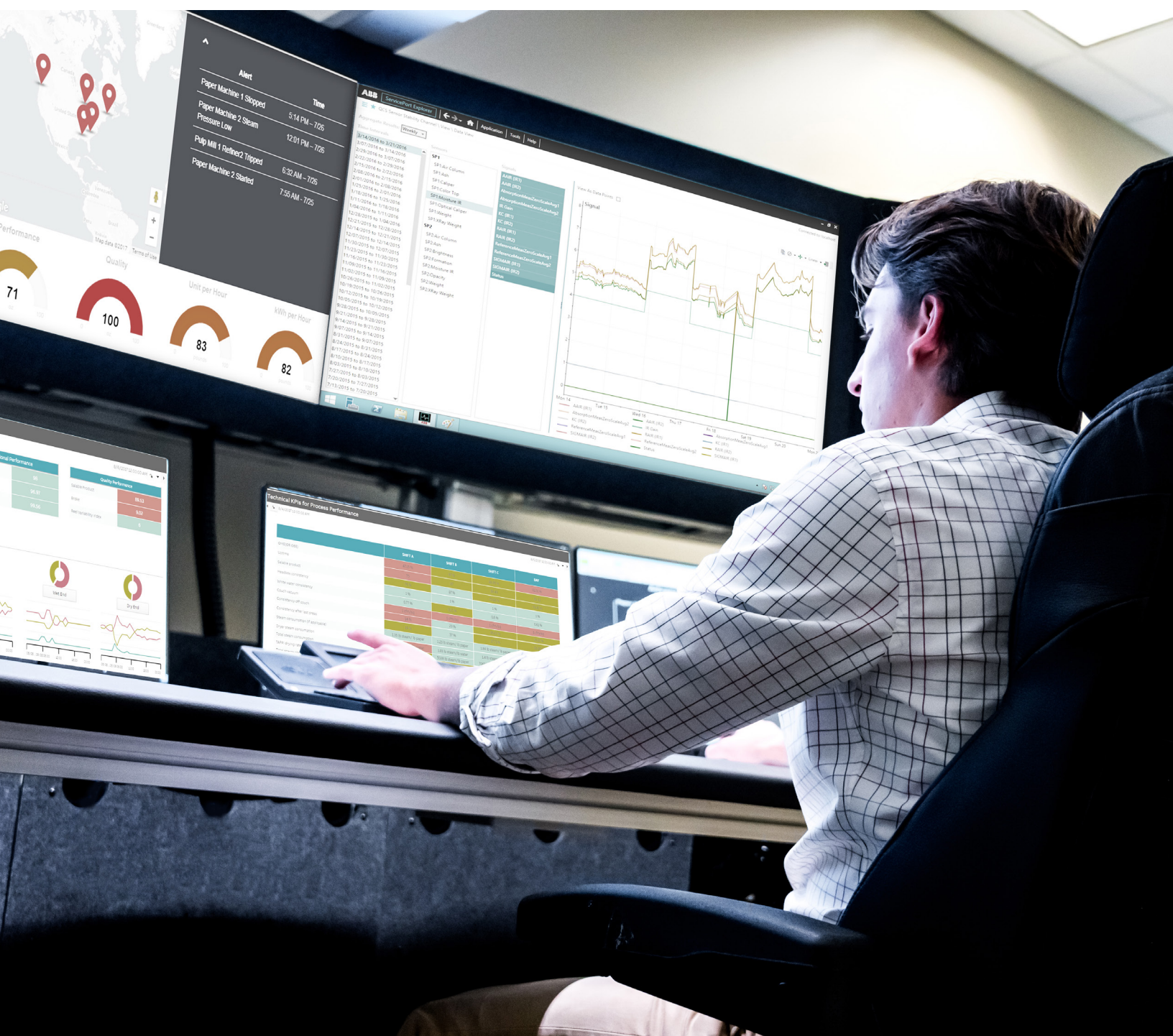


ABB Ability™

Collaborative Operations for Pulp and Paper



Collaborative Operations connects people in production facilities, enterprise headquarters and ABB Operational Centers to empower them with actionable insights that lead to better business decisions.

This is accomplished through world-class digital technologies, advanced data analytics and human expertise; the foundations of ABB Ability™.

ABB Ability™ is our unified, cross-industry digital platform — extending from device to edge to cloud — with systems, solutions and services that enable our customers to know more, do more, do better, together.













It's time to think about how digitalization can help the pulp and paper industry

The increased rate of digitalization has led to the Fourth Industrial Revolution, which in turn is creating tremendous opportunities for businesses. Connected devices, data storage technologies and advanced analytics have empowered organizations with information that lead to profitable business decisions. Per McKinsey Global Institute, this revolution could create up to \$11 trillion of annual economic impact by 2025, realized through productivity improvements and cost reductions.

Technologies such as Internet of Things, mobile internet and cloud computing are being considered the most significant advancements in the Fourth Industrial Revolution. Massive amounts of data produced by these technologies hold valuable information regarding process and asset performance. The expertise to derive actionable insights from this information and determine subsequent steps is crucial for realizing the full potential of emerging technologies.

Economic impact of 12 most significant technologies

(\$ trillions, annual)

1		Internet of Things	3.9 - 11.1
2		Mobile internet	3.7 - 10.8
3		Automation of knowledge work	5.2 - 6.7
4		Cloud technology	1.7 - 6.2
5		Advanced robotics	1.7 - 4.5
6		Autonomous and near-autonomous vehicles	0.2 - 1.9
7		Next-generations genomics	0.7 - 1.6
8		Energy storage	0.1 - 0.6
9		3D printing	0.2 - 0.6
10		Advanced materials	0.2 - 0.5
11		Advanced Oil & Gas exploration and recovery	0.1 - 0.5
12		Renewable energy	0.2 - 0.3

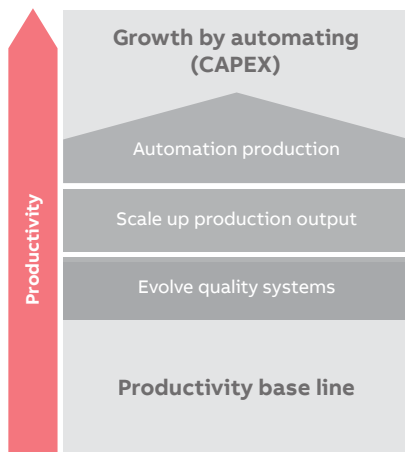
Digitalization requires collaboration

Thriving organizations adapt to changing business environments by successfully embracing technologies that drive innovation.

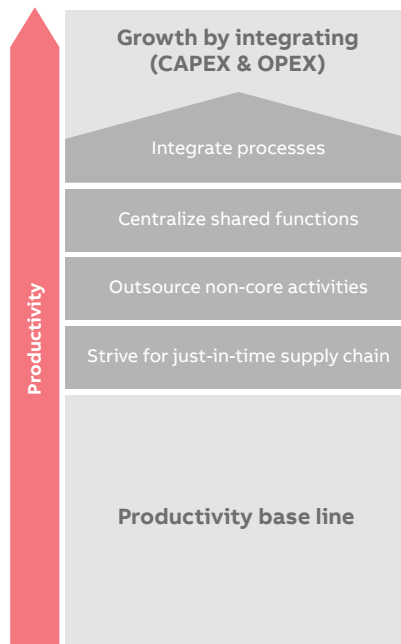
- During the industrial era, organizations increased productivity by automating their processes.
- During the information era, they augmented their growth by centralizing and integrating processes.
- And now, in the digital era, organizations can further increase their productivity by combining the power of digital technologies and business expertise through strategic collaborations.

For organizations operating in the pulp and paper industry, collaborative efforts will accelerate digitalization within their internal vertical value chain, as well as with their horizontal partners along the supply chain. This in turn will fuel innovation, improve customer interaction and increase operational efficiency.

Industrial Era



Information Era



Digital Era

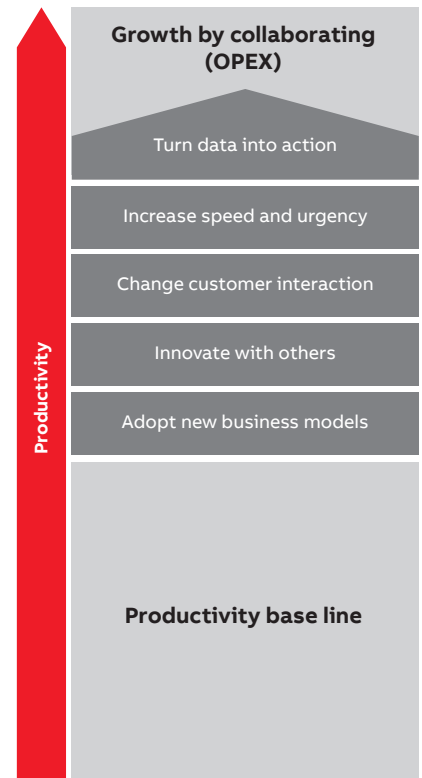









ABB Ability™ Collaborative Operations

We have long provided systems, software and services to help you run your business. We also realize these offerings just aren't enough to help you stay competitive in this increasingly global world. What is needed is a new way of thinking about how we can leverage this digitally connected world to improve your profitability.

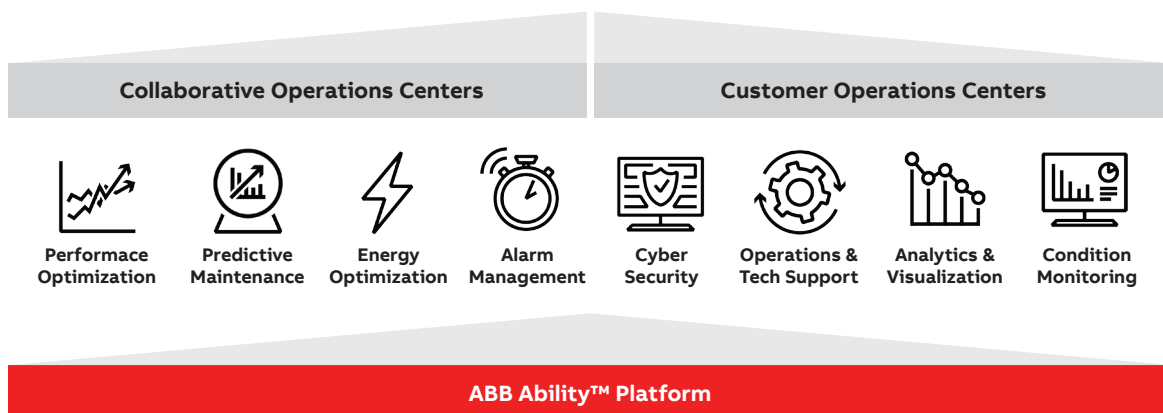
ABB Collaborative Operations provides powerful digital solutions that take advantage of today's operation and information technologies to help you optimize production, improve quality, and minimize costs. ABB Collaborative Operations employs the offerings below and matches them to your business needs:

	Offering	Features	Benefits
	Performance Optimization	<ul style="list-style-type: none"> • Expert analysis and advice • Industry-specific optimization tools • Advanced Process Control Services 	<ul style="list-style-type: none"> • Improved process performance • Increased productivity • Higher production quality
	Predictive Maintenance	<ul style="list-style-type: none"> • Remote condition monitoring of Key Performance Indicators 	<ul style="list-style-type: none"> • Reduced production interruptions through identifying and addressing issues before they happen
	Energy Optimization	<ul style="list-style-type: none"> • Metrics on energy production and consumption • Advanced analytics for detecting optimization opportunities • Electrical and process expertise 	<ul style="list-style-type: none"> • Streamlined cost • Reduced environmental impact • Process improvements
	Alarm Management	<ul style="list-style-type: none"> • Continuous analysis of alarm history • Alarm prioritization optimization 	<ul style="list-style-type: none"> • Improved operations • Reduced operator stress
	Cyber Security	<ul style="list-style-type: none"> • Continuous monitoring of potential threats • Regular reporting of installation status • Installation of patches and virus scan updates 	<ul style="list-style-type: none"> • Ensured equipment availability data security • Minimized data, process and safety risk
	Operations and Technical Support	<ul style="list-style-type: none"> • Continuous access to world-class expertise with best-in-class tools • Collaboration between your operators, technical staff, managers and ABB experts 	<ul style="list-style-type: none"> • Higher operational performance • Improved asset availability • Reduced need for visits to site by experts
	Analytics and Visualization	<ul style="list-style-type: none"> • Visualization of fleet, site and business KPIs from many sources • Benchmarking to industry best practices • Advanced data analytics 	<ul style="list-style-type: none"> • Fleet overview and optimization • Improved decision support • Increased performance • Data-driven business decisions

How does Collaborative Operations work?

Collaborative Operations is built on the ABB Ability™ platform; our unified, cross-industry, digital capability that extends from device to edge to cloud. This platform securely collects data from devices at mills, applies advanced analytics and generates actionable insights for customer operations at the plant level. Furthermore, the platform aggregates data from multiple mills into the cloud so that asset and performance issues can be identified, categorized and prioritized for proactive improvement actions.

Customers have access to data starting from the device level going all the way up to the enterprise level. ABB experts monitor this data remotely at Collaborative Operations Centers and connect with customers in real time to quickly identify and resolve issues using Collaborative Operations offerings such as Performance Optimization, Analytics & Visualization and Condition Monitoring. Increased visibility into processes at all levels enables management to replicate optimizations strategies for other sites, as well as throughout the enterprise.



Collaborative Operations around the world

ABB has several Collaborative Operations Centers in strategic locations around the world serving key customer industries, including pulp and paper. We regularly open new sites to serve our growing customer base. Each center is equipped with the latest remote monitoring and data analytics technology and works with our deep industry expertise to provide customers with collaborative value 24/7/365.



Why ABB Ability™ Collaborative Operations

We bring three key areas of expertise:



Technology

ABB pioneered the development of electrical and automation technologies, and is one of the world's largest providers of these technologies to process industries worldwide. We have prioritized R&D spending on digital technologies to help our customers successfully navigate this new age.



Industry Knowledge

ABB invented the online quality control paper scanning technology that is now standard on all paper machines globally. We continue to lead in this area, developing measurement and control products and applications that help papermakers make more of a better product at a lower cost.



Analytics

ABB has been providing data analytics to papermakers since the 1950s, showing detailed product quality in real time. These measurement, control and visibility technologies have influenced ABB's data analytics developments for all industries to identify, categorize and prioritize actions that improve productivity.

Case Studies



Paper mill in Scandinavia

Needed to identify source of unexpected moisture variations that was affecting paper quality and mill's productivity

We met that need with
QCS Sensor Performance

Customer Benefit

Reduced product rejects, revived quality and improved runnability



Paper mill in USA

Needed to optimize asset performance to improve production uptime

We met that need with
Control System Availability

Customer Benefit

Identified potential problems early, mitigated risks and increased system availability



Paper mill in Southeast Asia

Needed to reduce the risk of drives failure and increase system utilization

We met that need with
Drive System Availability

Customer Benefit

Reduced unplanned downtime and sheet breaks



Let's start collaborating

To get started or learn more, please contact
your local ABB sales representative or visit:

—
abb.com/pulpandpaper

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