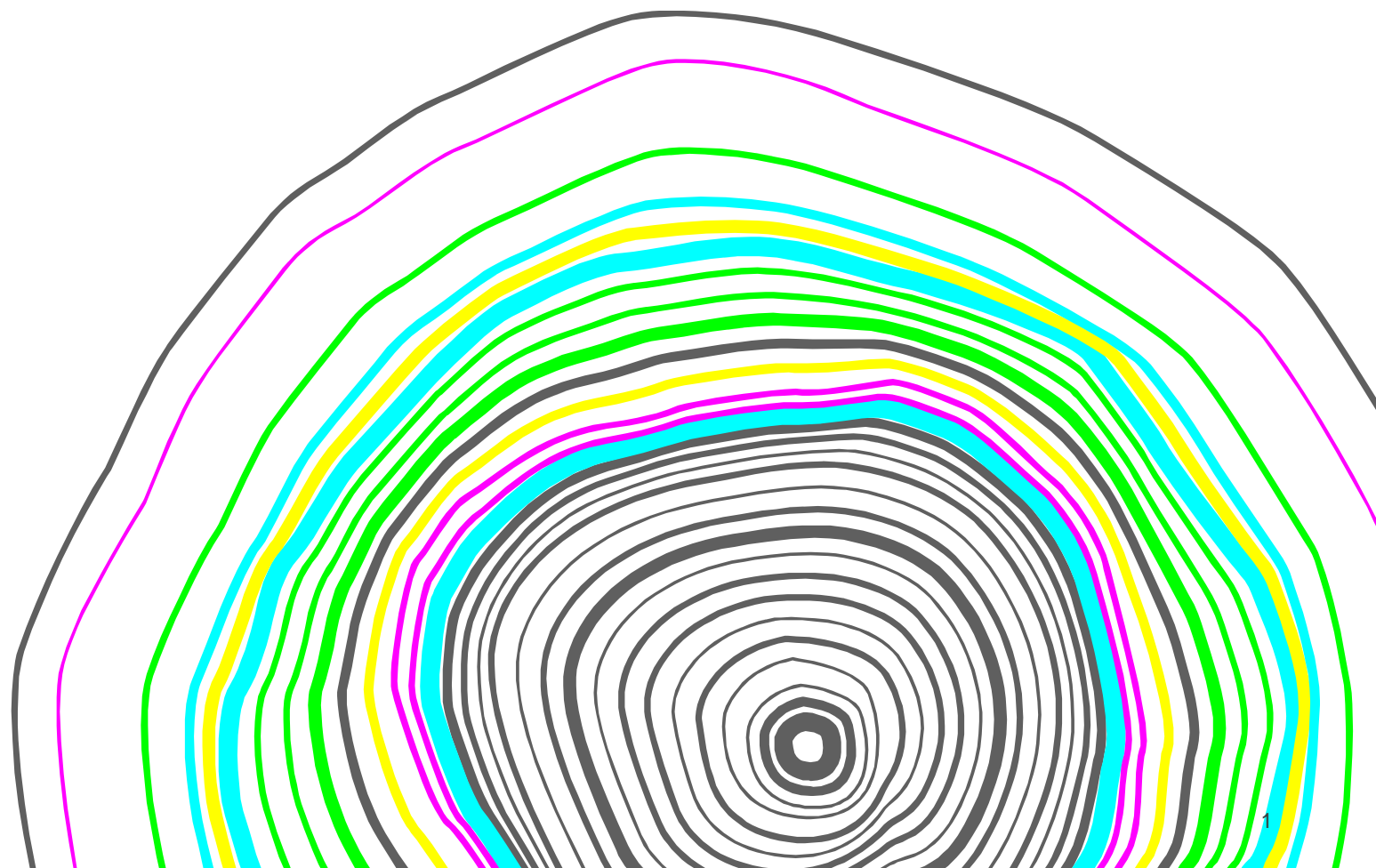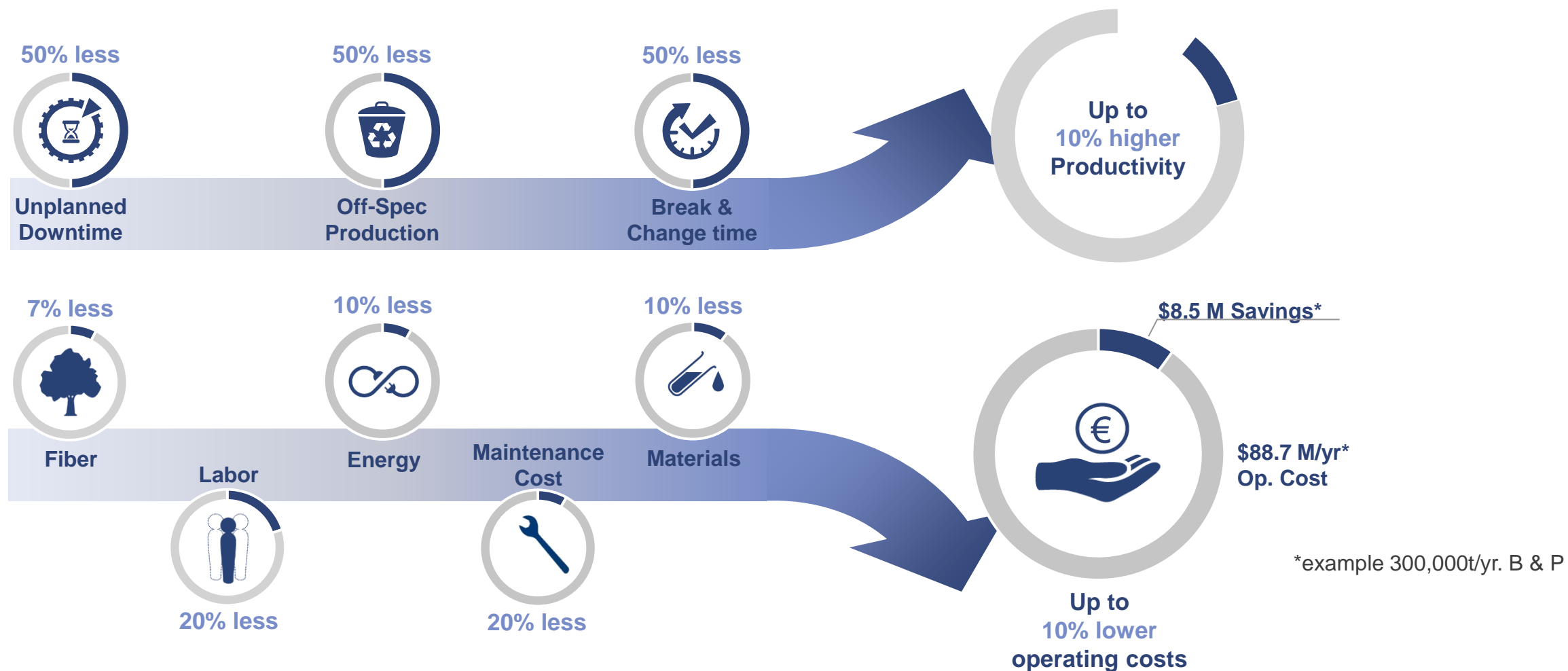# Papermaking 4.0 & IoT

Optimized papermaking processes using the **I**nternet **o**f **T**hings

Jürgen Käser; Voith Digital Solutions

Papermaking 4.0 – Targets

50% less

Unplanned Downtime

50% less

Off-Spec Production

50% less

Break & Change time

Up to 10% higher Productivity

7% less

Fiber

10% less

Energy

10% less

Materials

20% less

Labor

Maintenance Cost

20% less

$8.5 M Savings*

$88.7 M/yr*
Op. Cost

*example 300,000t/yr. B & P

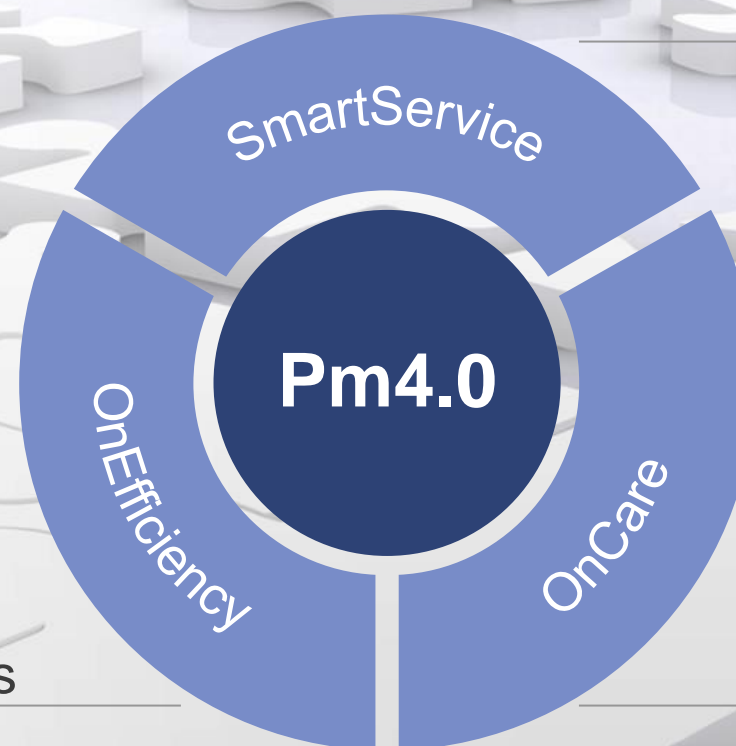Up to 10% lower operating costs

Papermaking 4.0 Solution Portfolio
The sum of three big talents

OnEfficiency: The modular solution Visualise, Stabilise & Optimise

OnCare: Intelligent condition based, predictive maintenance

SmartService: The service you need before you know it

SmartService

Pm4.0

OnEfficiency

OnCare

- Analytics
- Remote
- Upgrades

- Sensors
- Controls
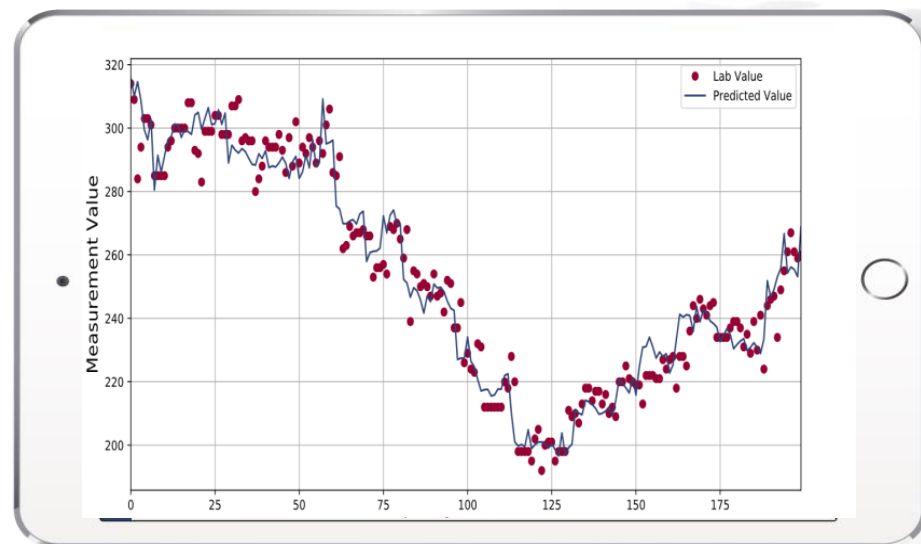- Actuators

- CMS
- CMMS
- Diagnostics

OnEfficiency Strength

Success story: Double ply board, 450.000 tons per yr.

Main features

- **VirtualSensors** to predict strength properties in real time
- **Automatic** control of strength
- **Cost based** controller adjustment
- **Various** combinations possible
- **Stable** product **quality** at minimum cost

Key benefits

Optimum quality

Lower cost of ownership

Process optimization
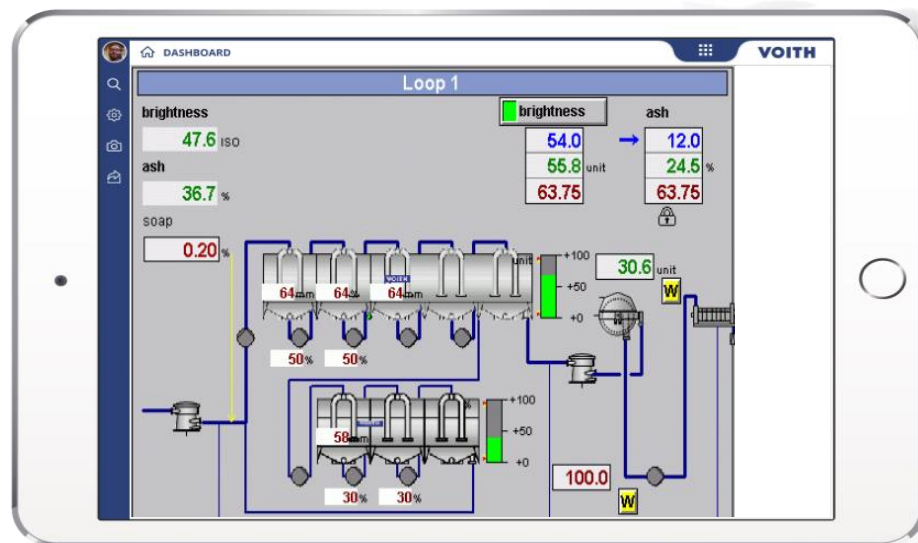
Stable process

Continuous improvements

Savings

	Total	1.32M€/yr.

OnEfficiency DIP
Success story: Newsprint, 170.000 tons DIP per yr.

Main features

- **Controls** the final quality of a DIP plant automatically
- **Adjusts** flotation cells and bleaching stages based on cost
- Loss **optimized** brightness gain
- High variety of **target settings**
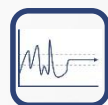- **Integrated PM QCS** brightness as lead constant

Key benefits

Optimum quality

Lower cost of ownership

Process optimization
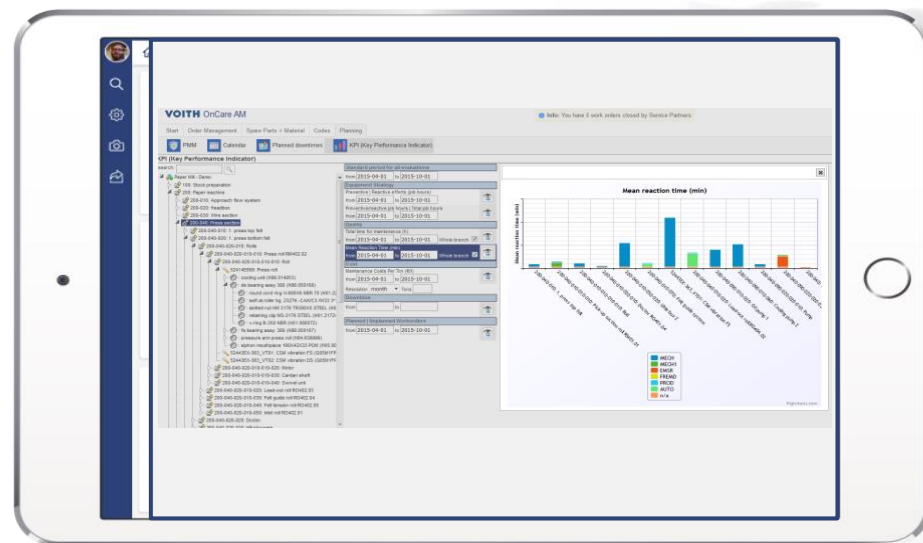
Stable process

Continuous improvements

Savings

	Total	2 M€/yr.

OnCare AM & OnCare MEx

Success story: Linerboard, 200.000 tons per yr.

Main features

- **Prepopulated** system
- **"Best practice"** maintenance processes
- Complete **transparency** – automatic KPI tracking & multi-mill integration
- Availability **on any device**
- **Full integration** with OnCare CM & compatible with all ERP systems

Key benefits

Increased transparency

Implementation < 4 months

Lower cost of ownership

Less complexity

Support

Achievements

	Before	After
Net efficiency [%]	92	95.4%
Maintenance cost [$/ton]	37	<31

OnCall Video – PILOT PHASE

When help is needed at the machine...you can get it immediately!

Main features

- **Availability**: OnCall Video enables virtual expert support where it is needed

- **Collaboration**: Find solutions together with an expert online

- **Interactive**: See and redline the same picture in real-time synchronization

- **Leverage**: Save time to come to the right decision

- **Secured Network (optional)**: Local wireless, security standards, firewalls, VPN connection

Key benefits

Expert collaboration

Implementation < 4 months

Future-ready

External support

Information & Communication Technologies
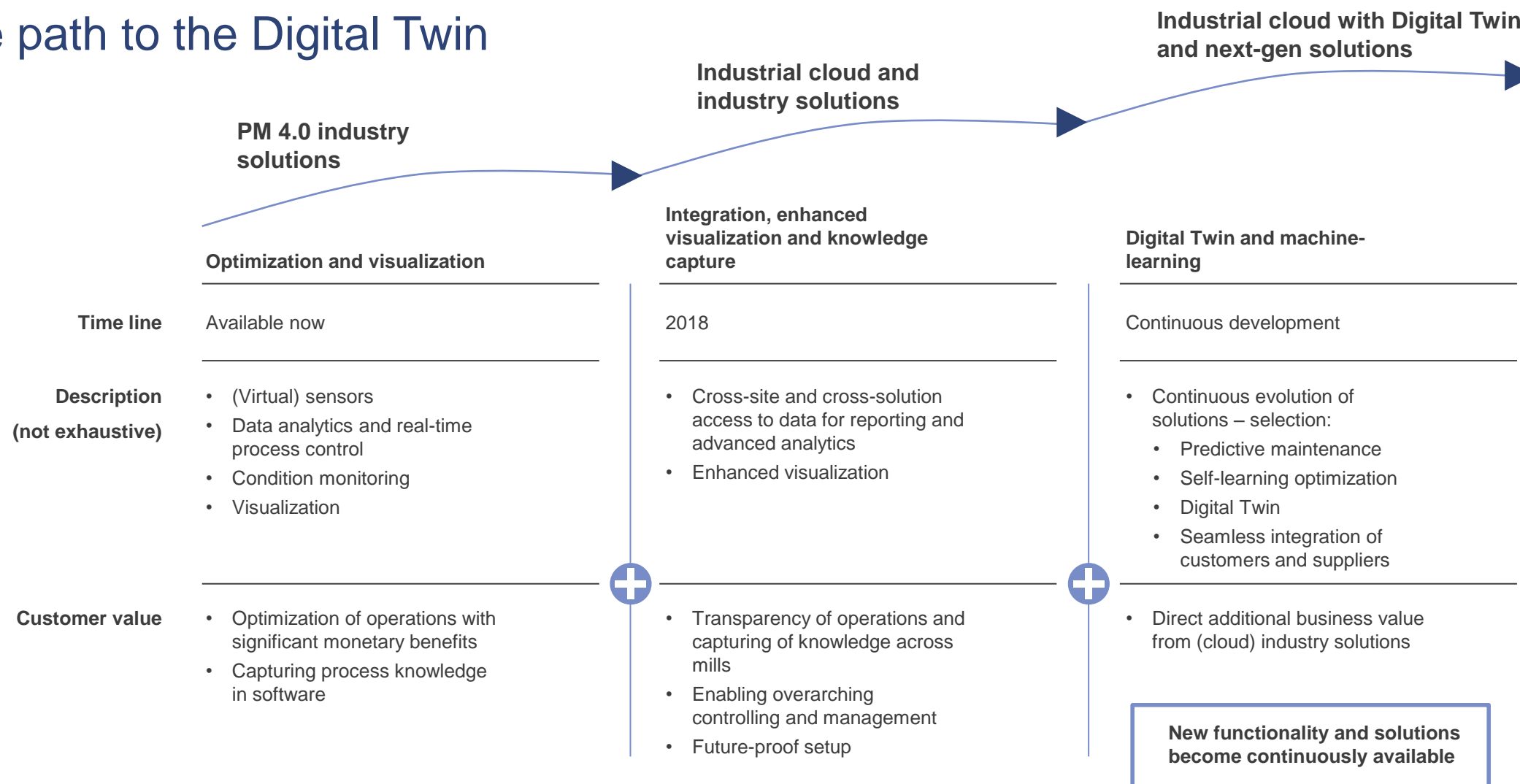for consumer markets
enter the industrial space

Mobile World Congress 2016

Evolution of Papermaking 4.0 solutions with IoT

The path to the Digital Twin

Industrial cloud with Digital Twin and next-gen solutions

Industrial cloud and industry solutions

PM 4.0 industry solutions

	Optimization and visualization	Integration, enhanced visualization and knowledge capture	Digital Twin and machine-learning
Time line	Available now	2018	Continuous development

Description **(not exhaustive)**	• (Virtual) sensors
	• Data analytics and real-time process control
	• Condition monitoring
	• Visualization
		• Cross-site and cross-solution access to data for reporting and advanced analytics
		• Enhanced visualization
			• Continuous evolution of solutions – selection:
			  • Predictive maintenance
			  • Self-learning optimization
			  • Digital Twin
			  • Seamless integration of customers and suppliers

Customer value	• Optimization of operations with significant monetary benefits • Capturing process knowledge in software	• Transparency of operations and capturing of knowledge across mills • Enabling overarching controlling and management • Future-proof setup	• Direct additional business value from (cloud) industry solutions

New functionality and solutions become continuously available

Our Goal – Digital Twin

Utilize structured and cross-linked information in the cloud

Benefits

+ simulate

e.g. rebuilds

+ predict

e.g. mechanical failures

+ optimize

e.g. production process

+ test

e.g. process changes

+ recognize

e.g. saving potentials

+ plan

e.g. logistics

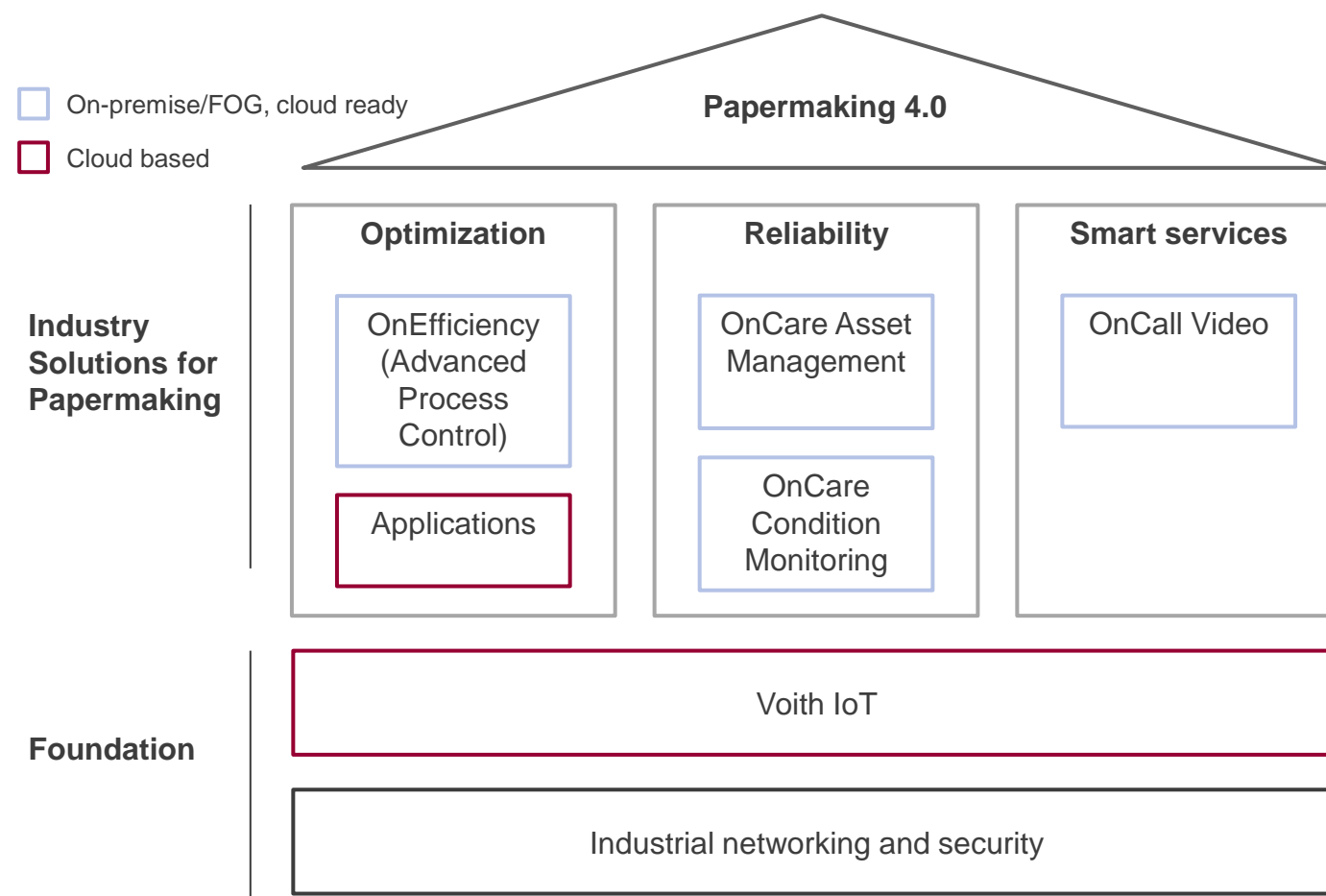# Get unlimited possibilities with Voith IoT

FOR THE CUSTOMER

Voith's IoT offering takes the unknowns out of the process, replacing it with science and analytics. By doing so, Voith's IoT provides complete machine operational transparency leading to improved machine efficiency, quality, and economic performance.

FOR THE USER

Voith's IoT offering is a fully integrated customized experience for all users based on their needs by delivering intuitive and easy to understand information, analysis and control options relevant to the user's role.

Papermaking 4.0 & IoT
Solution bundles increase value

Papermaking 4.0

□ On-premise/FOG, cloud ready
□ Cloud based

Industry Solutions for Papermaking

Optimization	Reliability	Smart services
OnEfficiency (Advanced Process Control)	OnCare Asset Management	OnCall Video
Applications	OnCare Condition Monitoring	

Foundation

Voith IoT

Industrial networking and security

Benefits:

- Future-ready PM4.0 concepts
- Data is transformed into information
- Interoperability and scalability give flexibility
- Best practice implementation and cross-site learning
- Increased transparency, time and cost savings as well as productivity gains

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for Generations

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