DITP BLED SYMPOSIUM 2017

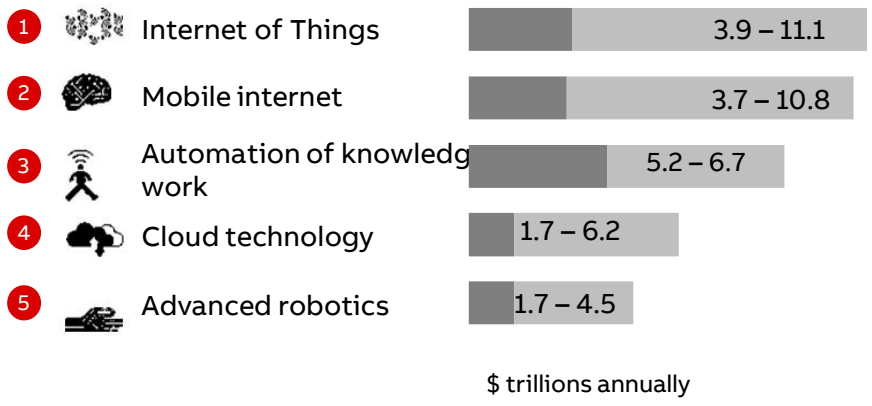
The Best in Class Mill Operations

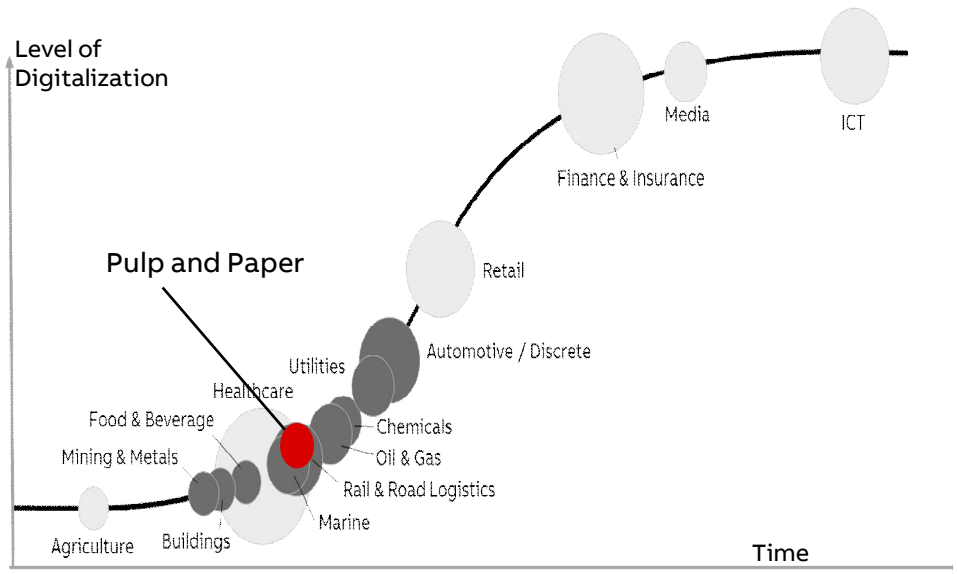
Mikko Jalava, Sales Director CPM

Industrial markets poised for massive value migration

A $4 – 11 trillion digital opportunity by 2025

Economic impact of most significant technologies

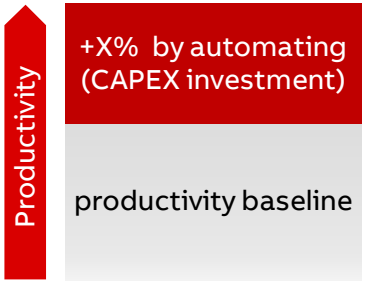




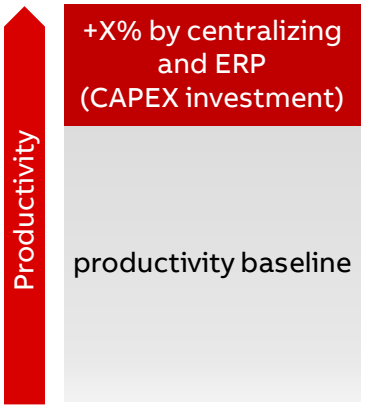
Why a new way of working?

CAPEX – based productivity levers are exhausted. Collaboration is the step to next level productivity.

Step 1: Automate



Step 2: Centralize



Step 3: Collaborate

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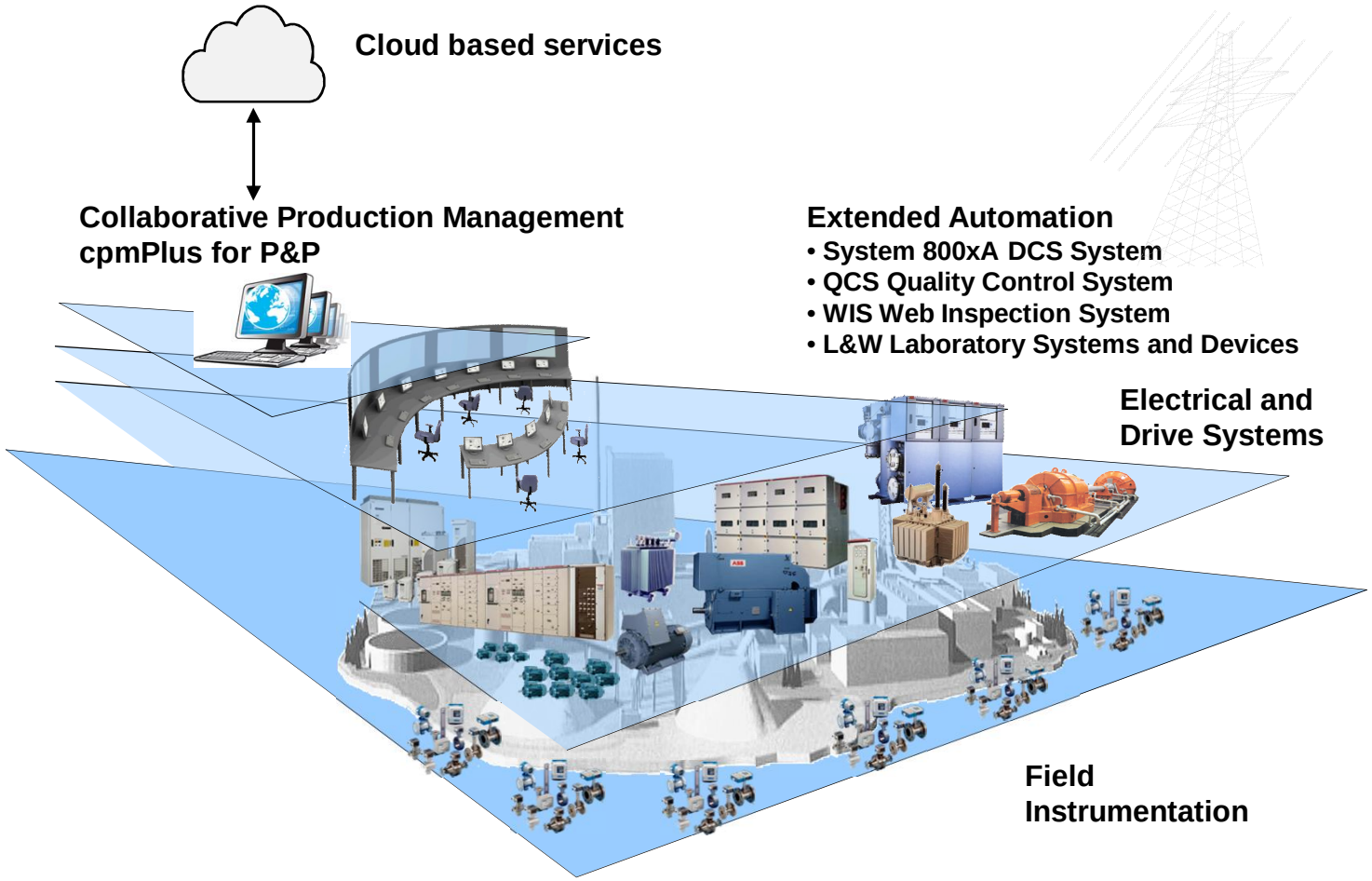
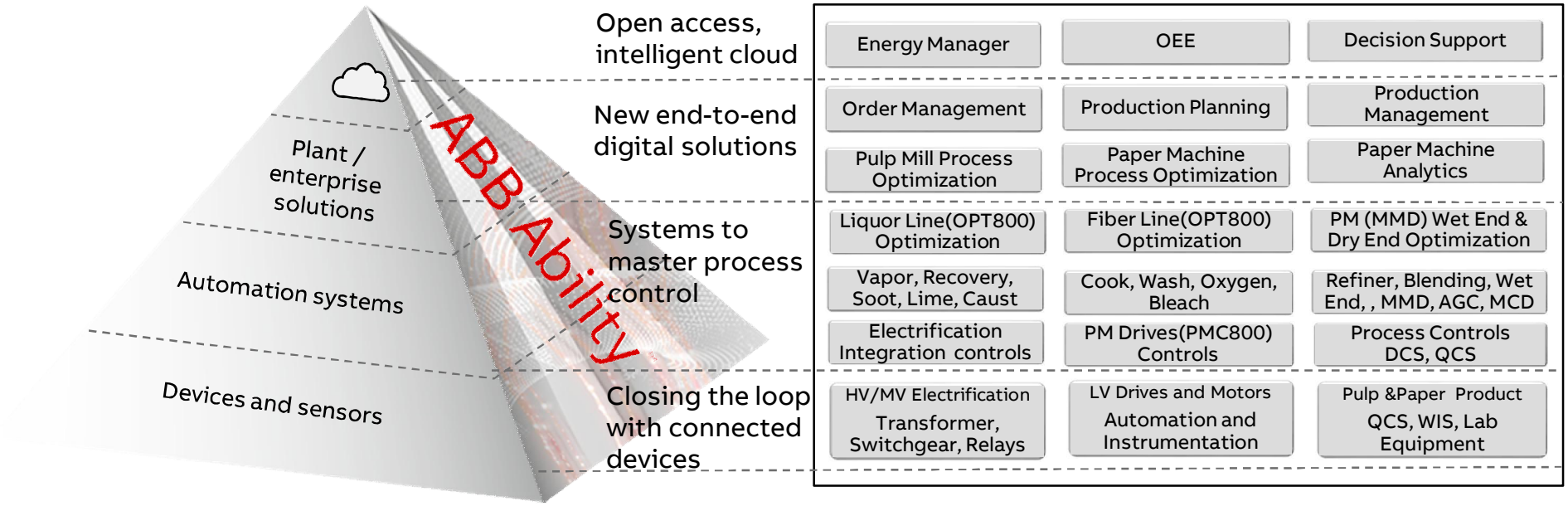
Collaborative Production Management for P&P
Umbrella for ABB field instruments



Unlocking the ABB potential in digital

ABB Ability™: Pulp and Paper digital solutions



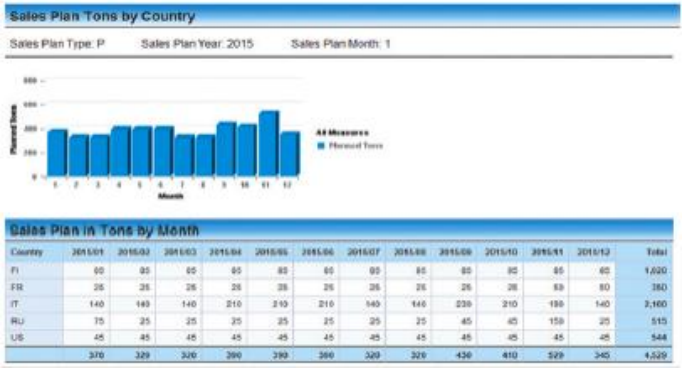
cpmPlus Order Management
Agility through full integration

Key Features:

- Order entry
- Capacity and warehouse level checks
- Order confirmation, invoicing and complaint handling
- Automatically generates order confirmations, sales documents, invoices etc.

Key Customer Values:

- Complete integration with other cpmPlus products offer full visibility to planning, production, delivery, warehousing and delivery planning à eliminates need for data exchange interfaces
- Capacity check & profitability checks for the sales personnel



Average Price/Ton by Month

Product	Customer	1	2	3	4	5
BK-G060	ITHERALD					920.00
BK-R060	ITHERALD		800.00	825.00	850.00	850.00
NW-W050	ITHERALD					
NW-W055	ITHERALD	525.00	550.00	550.00	575.00	550.00
	Average	525.00	640.42	649.03	658.64	733.14

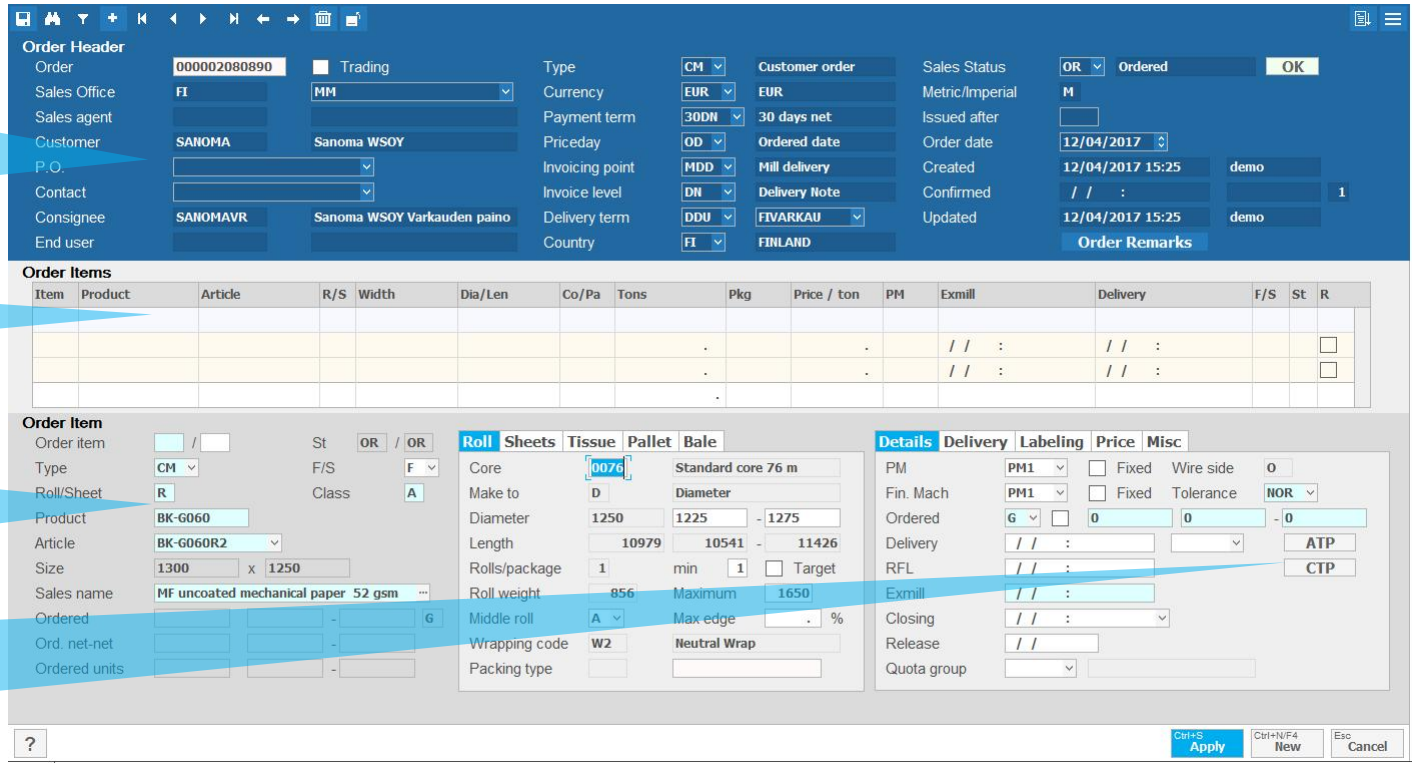
cpmPlus Order Management
Order Entry

Enter sales office and customer and default data is updated automatically

Order line display

Order items are selected from ready made lists with default values

ATP = available to promise
CTP = capacity to promise
ATP/CTP allow to see available stock, production capacity



cpmPlus Production Planning
Optimized production plans

Key Features:

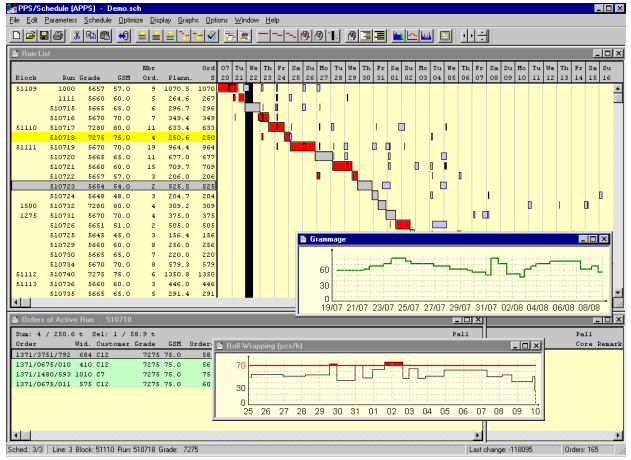
Scheduling tool:
- Used for production scheduling
- Automatic or manual block scheduling
- Capacity tools, simulation possibility, production time calculations etc.

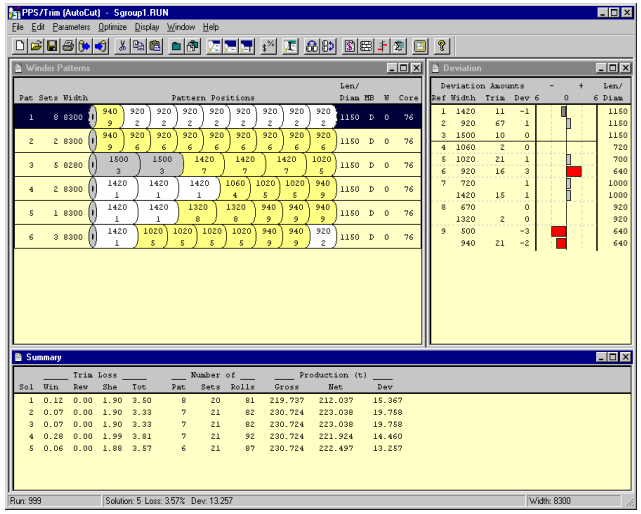
Trimming tool:
- Trimming tool is used to create optimised production runs at winders à 50% less trim waste compared to manual trimming

Re-trimming tool:
- In a case of quality defect re-trimming tool can be used to remove quality defect with minimum amount of waste.

Key Customer Values:

- Minimizes delays and deviations from ordered quantities
- Minimizes grade change costs and trim losses in all production phases
- Minimizes inventories, maximizes value of production
- Multimill planning and optimisation, Profitable to Promise tool (searches most economic mill to produce)
- Cost function shows economic impact of schedule change





cpmPlus Production Planning
Scheduling tool

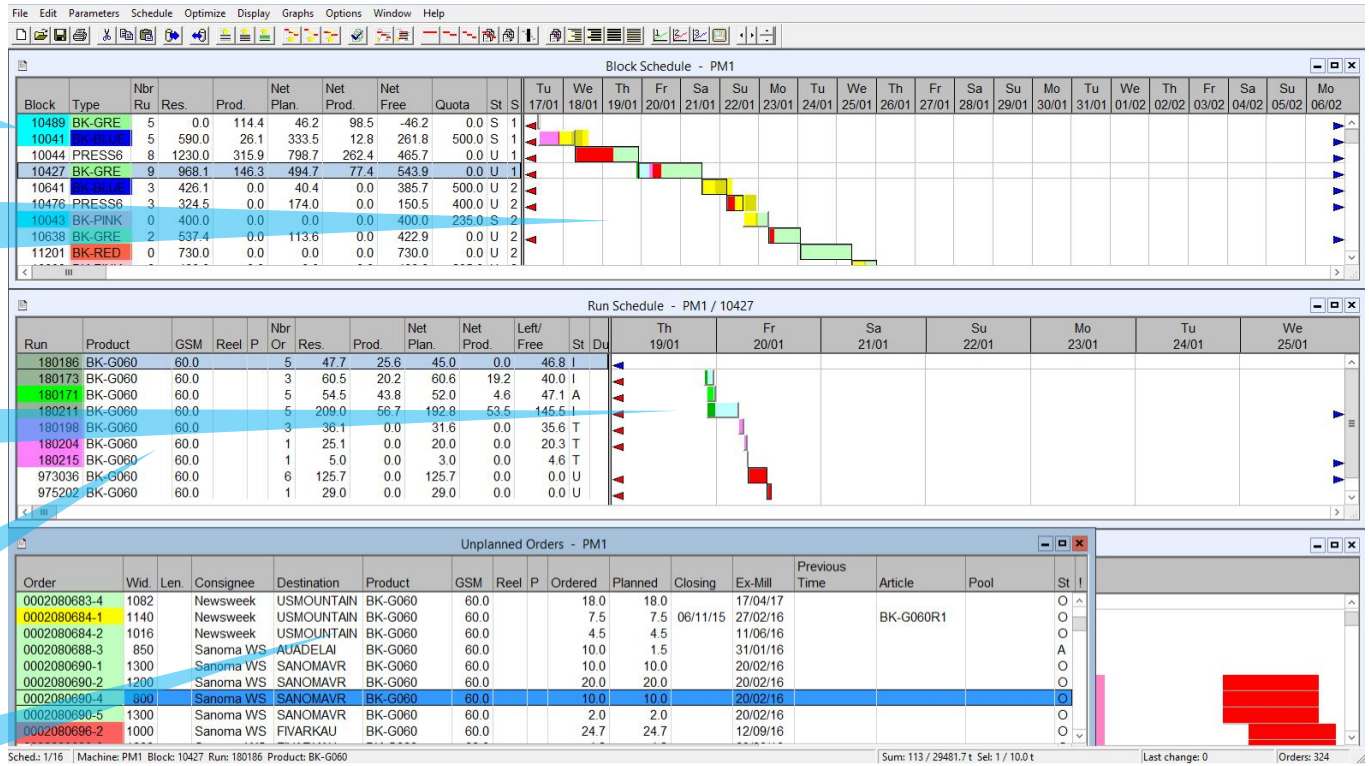
Status of planned orders and availability of production blocks

Color-coded blocks indicate free capacity, over production, late orders etc.

Run schedule of papermachine displayed in color-coded blocks

Status of each planned orders

Uplanned orders waiting to be scheduled



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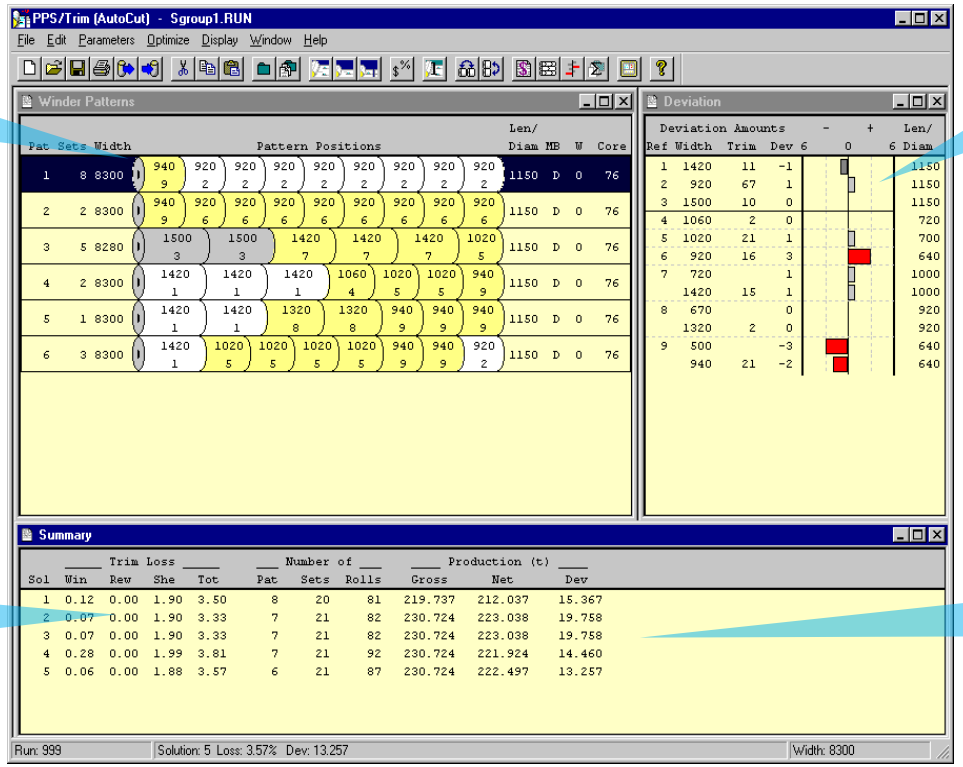
cpmPlus Production Planning
Trimming tool

Jumbo roll trimming plan per customer/sheet size etc.

Over-/underproduction per roll size

Trim loss per percentage, money or tons is indicated

Trim optimiser calculates different trimming solutions



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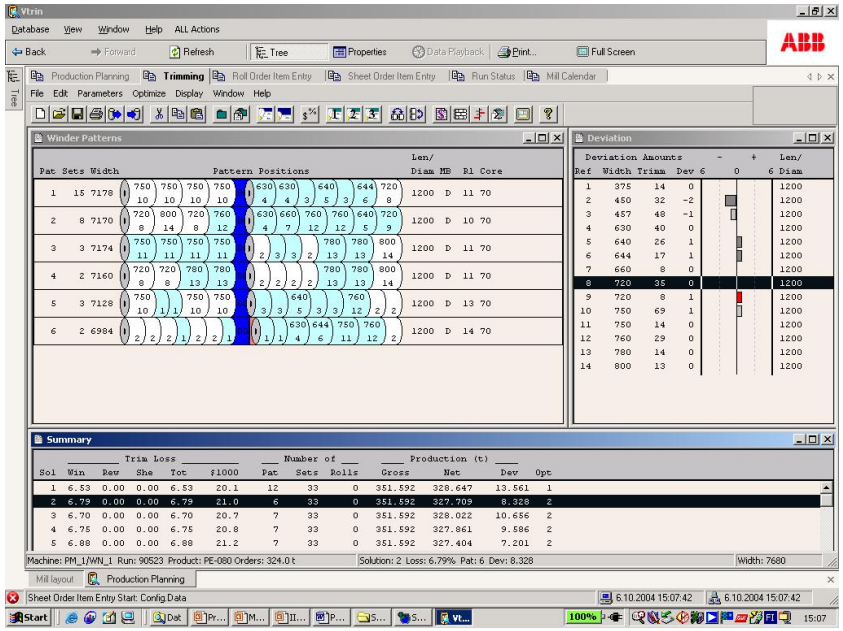
cpmPlus Quality Management
Comprehensive quality control

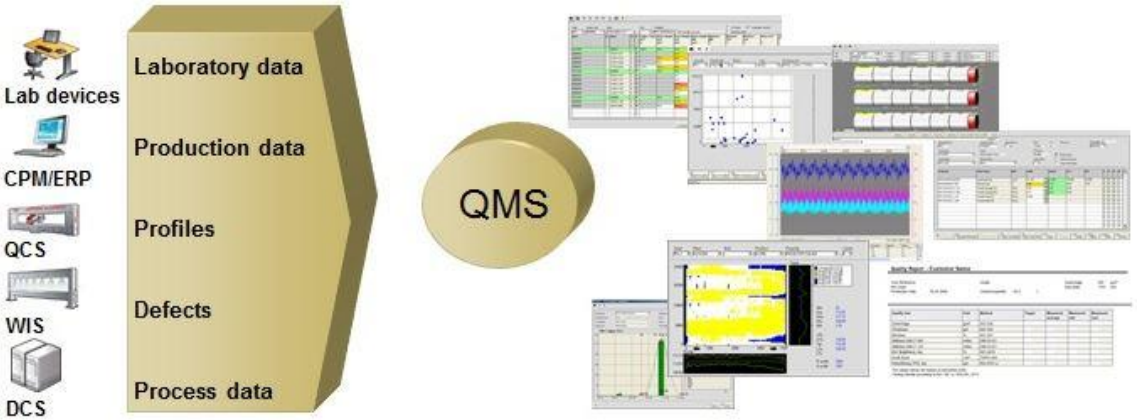


Key Features:

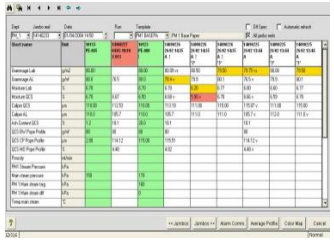
- Quality Manager collects all quality management data into one interface
- Allows user to follow quality of raw materials, semi-finished products and finished products.
- Quality comparison and benchmarking across different sites

Key Customer Values:

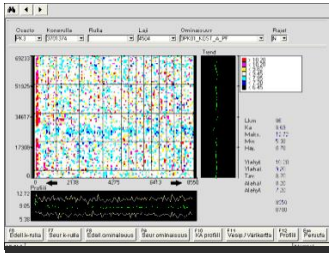
- Minimum quality losses
- Decreased reclamation costs
- Provides complete traceability
- Streamlines quality operations
- Visualizes and consolidates quality related data from various sources



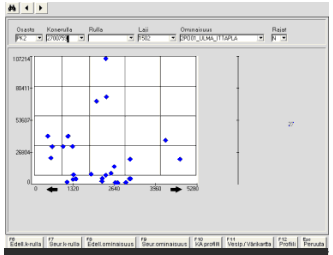
cpmPlus Quality Management
Comprehensive quality control



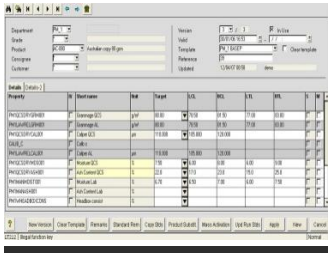
Laboratory Data



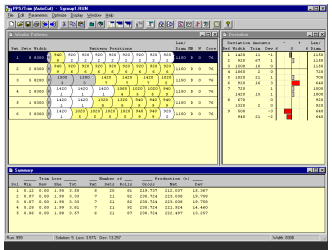
QCS Data



WIS Data

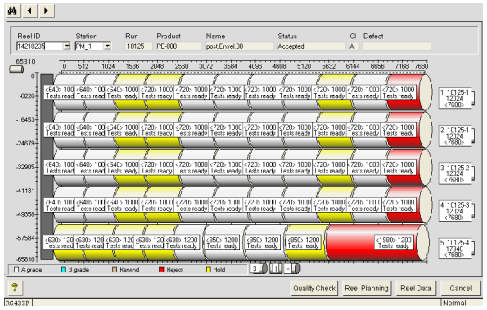


Product specification/ Customer requirements



Optimized Trim
(assume uniform quality)

Automatic re-classification based on measured quality and customer requirements



White	= A-quality
Yellow	= B-quality
Red	= Reject

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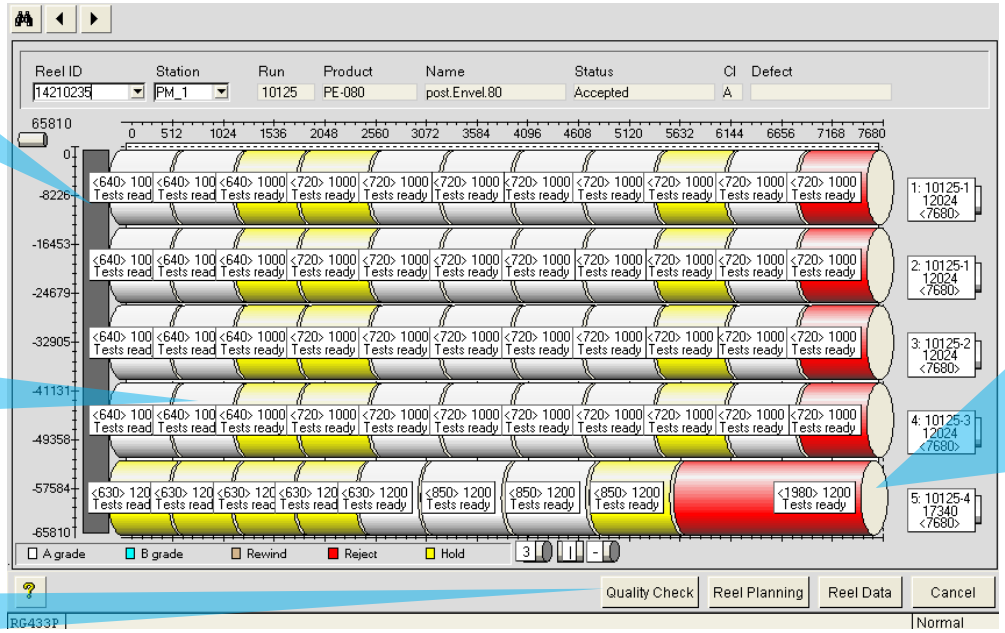
cpmPlus Quality Management
Jumbo roll quality map

Quality map of jumbo shows classification of each roll

Roll labels indicate customer and roll dimension

Quality data and reel data is available for each individual roll



After PM user can make re-trimming plan or re-classify rolls to reduce waste material. Re-classification may mean selecting a different customer, different grade or accepting reject roll as B-quality.

cpmPlus Production Management

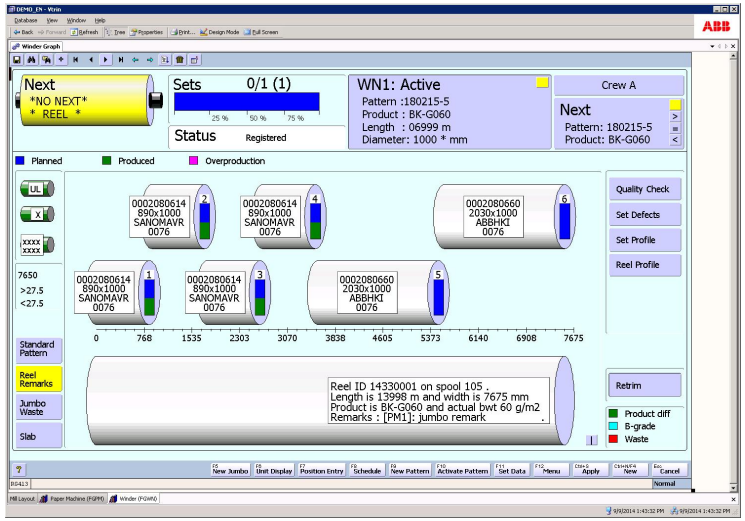
Executing production plans optimally

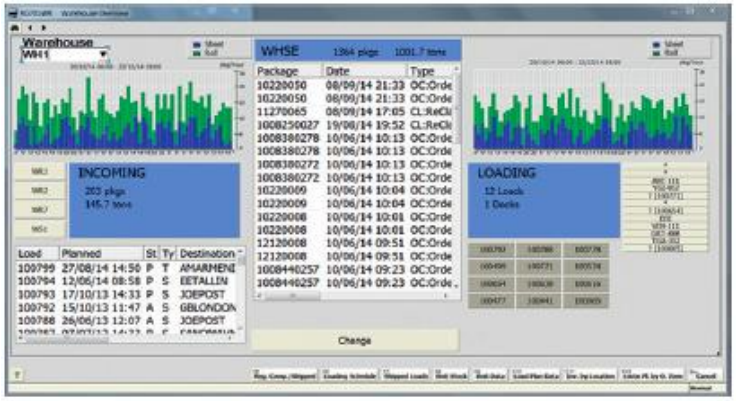
Key Features:

- Production Management can be used to manage all manufacturing transactions from raw material management, through manufacturing process to the warehouse and finally to truck loading.

Key Customer Values:

- Avoids under/ overproduction
- Reduces inventories (FG, WIP, materials)
- Ensures delivery on time - in full
- Provides full visibility to production
- Provides complete product genealogy
- Provides on-line product costing
- Streamlines operations





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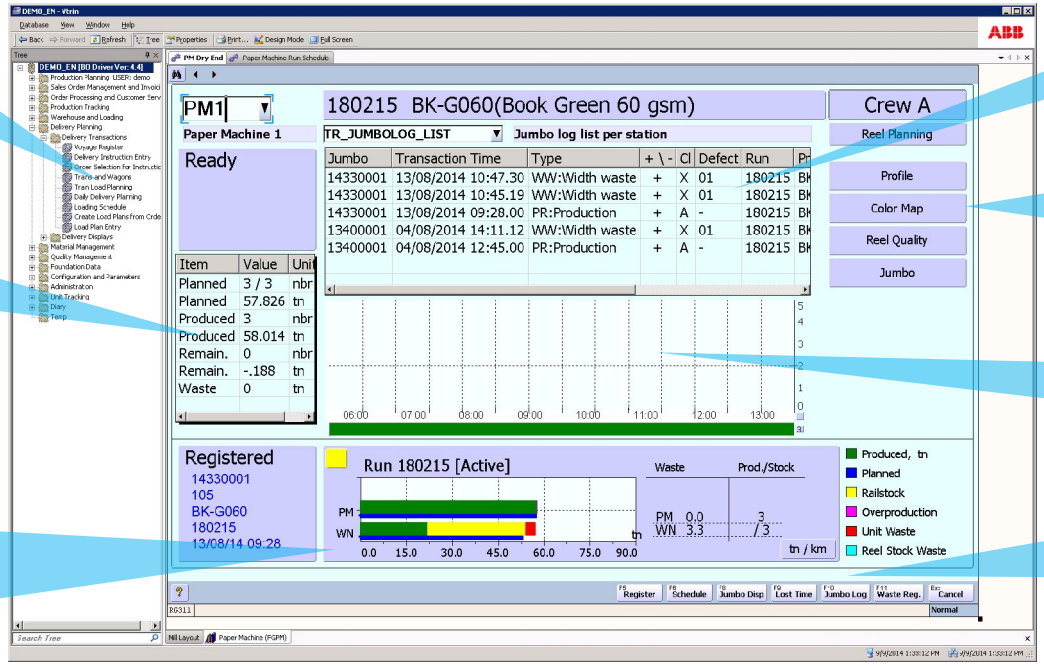
cpmPlus Production Management
Paper Machine Dry-end

Production hierarchy tree for easy navigation

Status of each planned order

Run status showing planned tons, produced tons on PM and on Winder. Also indication on railstock, waste and overproduction



List of last actions for active run

Navigation buttons for quality data

Time display of PM production (no transactions here)

Navigation buttons to classify events

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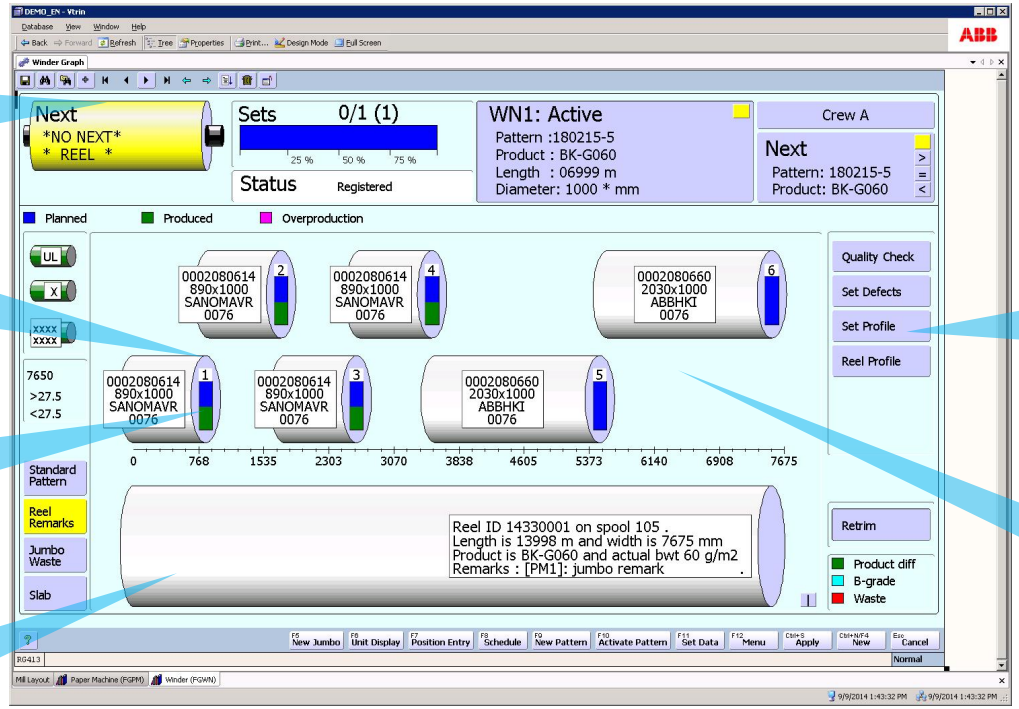
cpmPlus Production Management Winder Station

Production information: active run, next sets, status…

Planned rolls from reel. Labels show ID, dimensions and customer.

Color bars indicate production status. Green = produced.

Reel ID information



Navigation buttons for quality data

Each roll can be clicked to see color map, profile, defect map etc.

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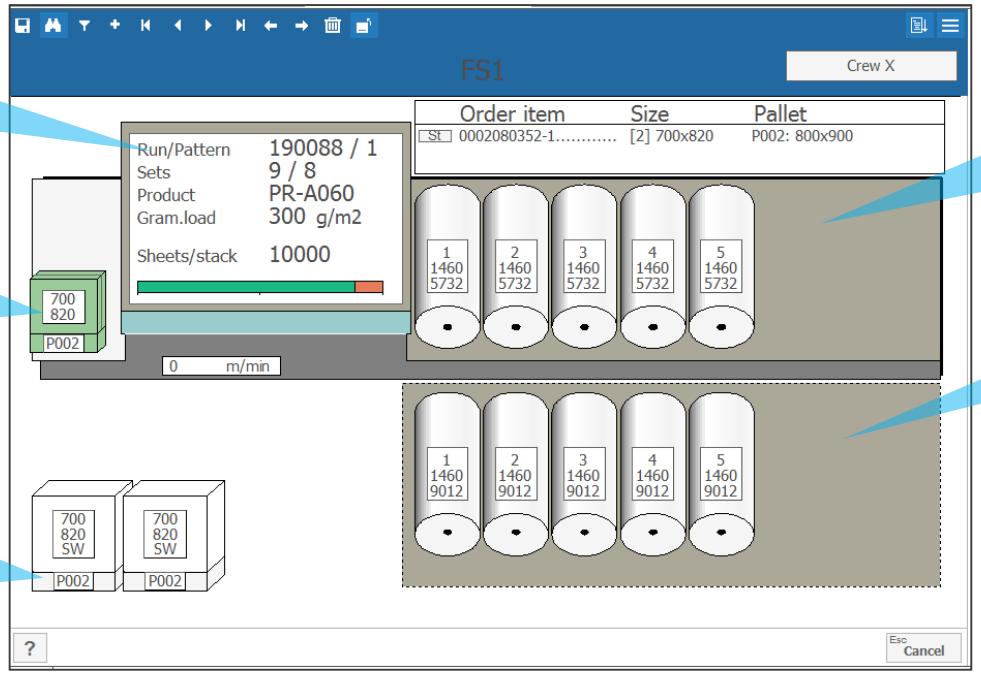
cpmPlus Production Management Sheeters

Run Status: pattern, sets, grammage, product

Sheet size + actual production speed

Skids waiting to be registered



Mounted rolls. Roll can be clicked to open roll specific data.

Rolls waiting on floor storage area.

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cpmPlus History Process Data Management
Value added applications for pulp and paper

Key Features:

- cpmPlus History is a database to store all process measurements as frequently as possible and as long as needed.
- cpmPlus History is used to view, analyse and report process information using it's built-in application development tools.
- cpmPlus History is the foundation for many value added applications such as Energy Manager and cpmPlus OEE.
- Can be easily integrated to other systems (ERP, DCS) via direct interface.

Key Customer Values:

- Fast, easy access database for all process data
- Creates full transparency in online process and history data.
- Together with added application creates measureable value.

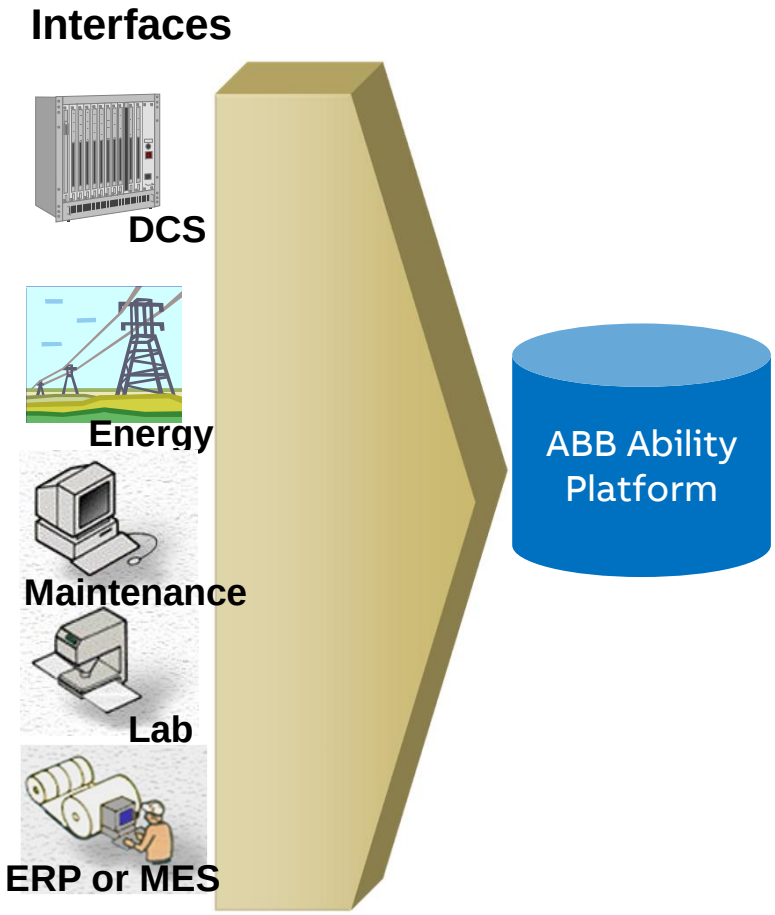
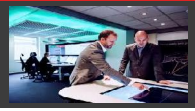


ABB Ability™ Collaborative Operations

Collaborative Operations provides ability to improve plant availability, performance, and quality

ABB Collaborative Operations Centers



Customer Operations Centers

- Analytics and Visualization
- Operations and Technical Support
- Simulation
- Performance Optimization
- Energy Optimization
- Condition Monitoring
- Asset Health
- Predictive Maintenance
- Emission Monitoring
- Safety Management
- Alarm Management
- Cyber Security
- Control Centers

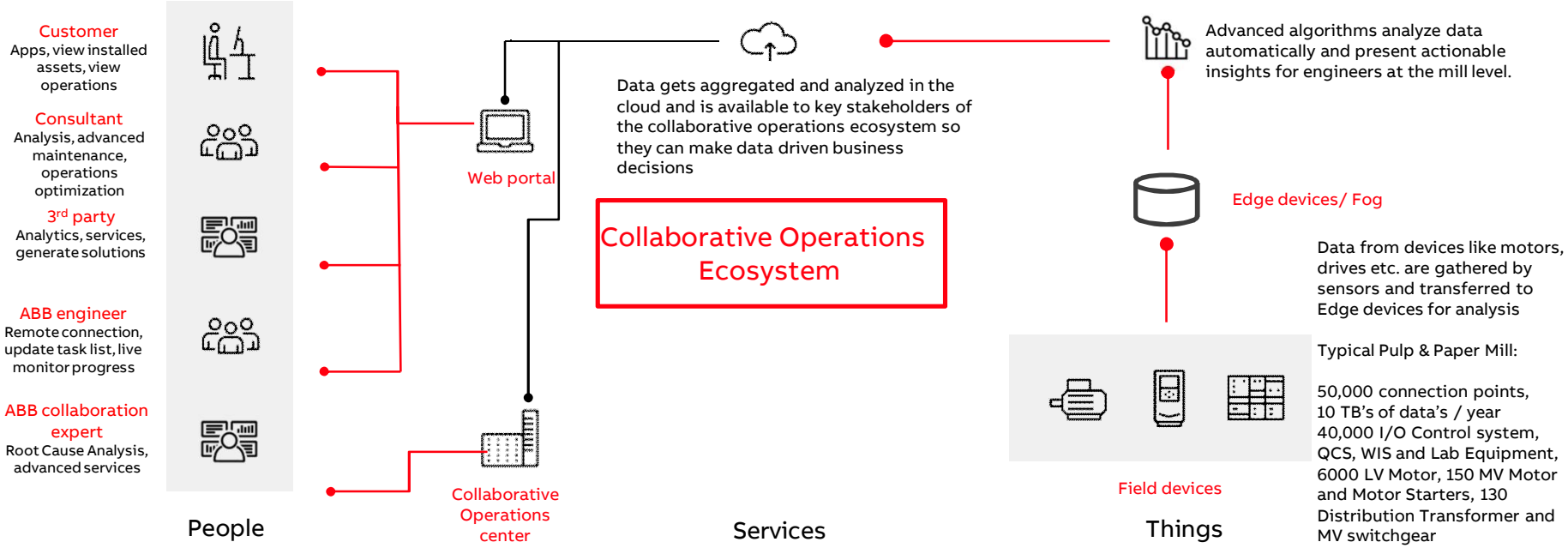
Microsoft Azure

ABB Ability™ Platform

IBM Watson

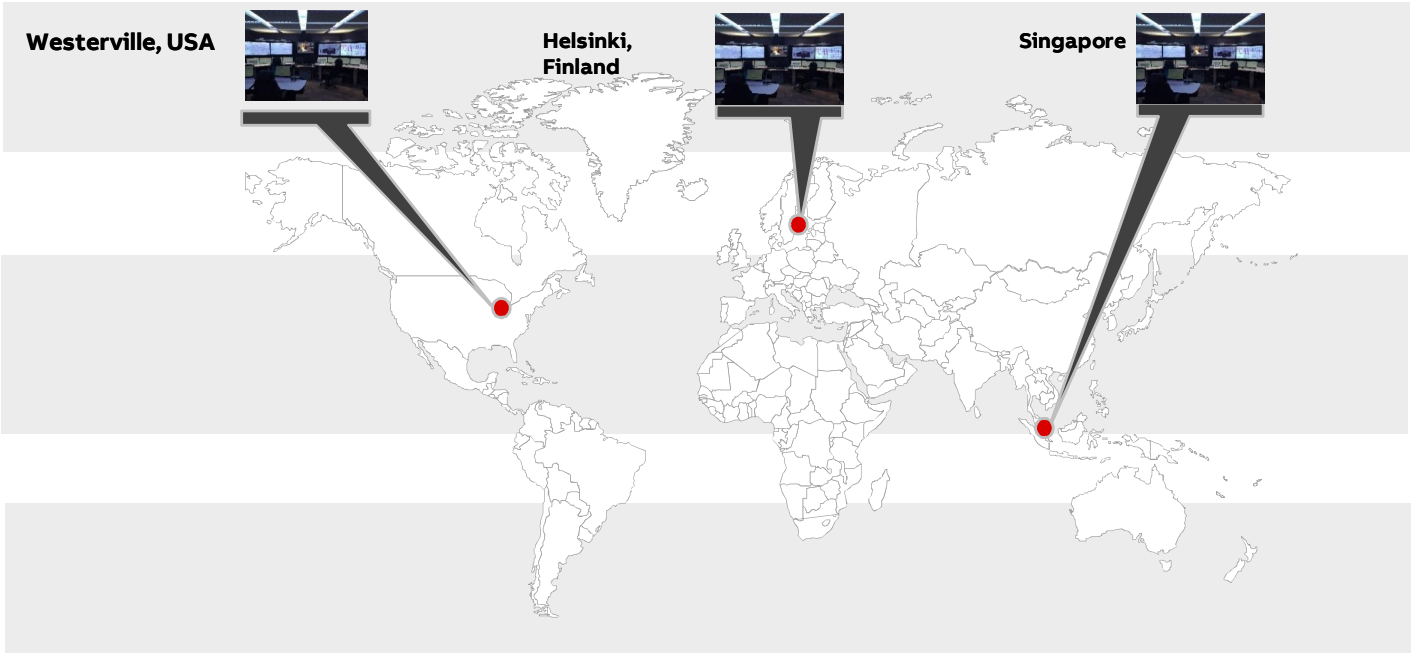
Collaboration in data-driven ecosystem

People make the difference



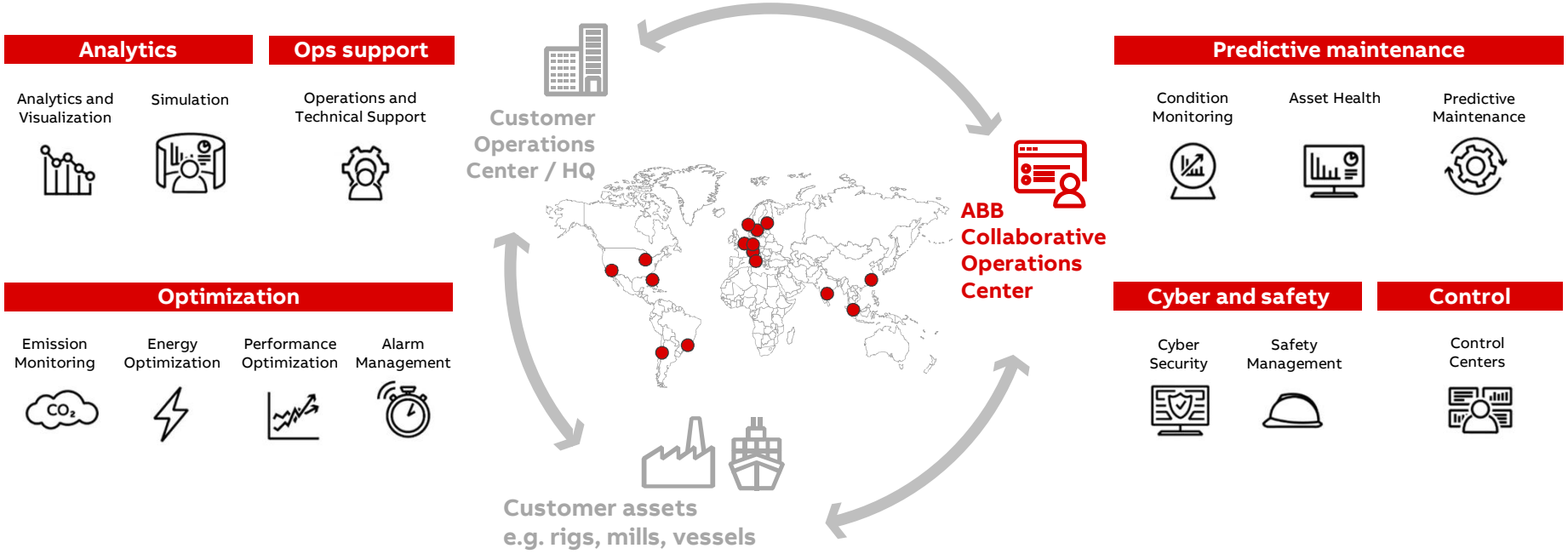
Collaborative Operation Centers for Pulp and Paper

Follow-the-sun strategy for pulp and paper customers



Leading solutions for ABB Ability™ Collaborative Operations

Collaborative Operations turns data into money at single plants and across enterprises



Process Performance Improvement Digital Services

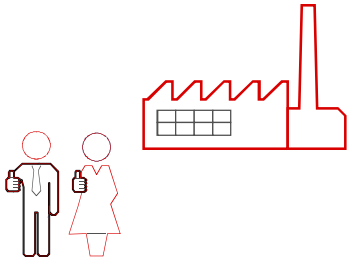
Digital technologies accelerate service delivery and value

Traditional Services

Ensure availability

Avoid plant process disturbance

Control costs



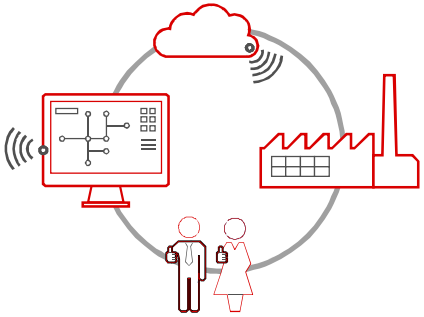
Process Improvement Services

Increase Reliability

Improve Process Performance

Reducing quality variances

Productivity improvement



Digital allows us to

Capture knowledge fast

Analyze data quickly

Improve performance continuously

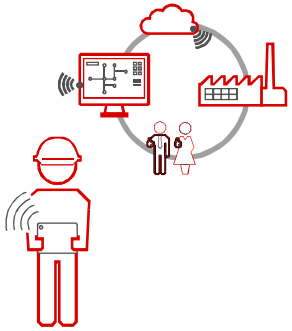
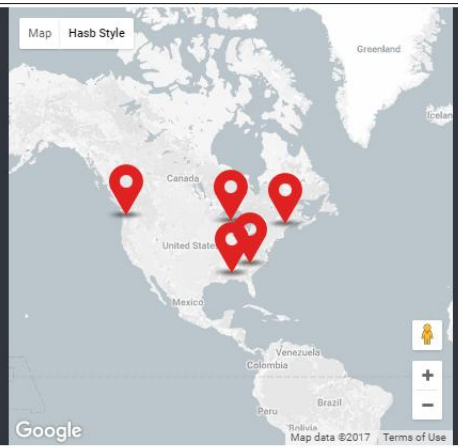


ABB Ability for Pulp and Paper

Turning insights into actions

Fleet

Status	Location	Production
Offline	Portland, Maine	Paper Machine 1
Stopped	Portland, Oregon	Paper Machine 2
Warning	Appleton, Wisconsin	Power Plant 1
Offline	Appleton, Wisconsin	Power Plant 2
Warning	Mobile, Alabama	Power Plant 3
Running	Augusta, Georgia	Paper Machine 3



Alert	Time
Paper Machine 1 Stopped	5:14 PM – 7/26
Paper Machine 2 Steam Pressure Low	12:01 PM – 7/26
Pulp Mill 1 Refiner2 Tripped	6:32 AM – 7/26
Paper Machine 2 Started	7:55 AM - 7/25

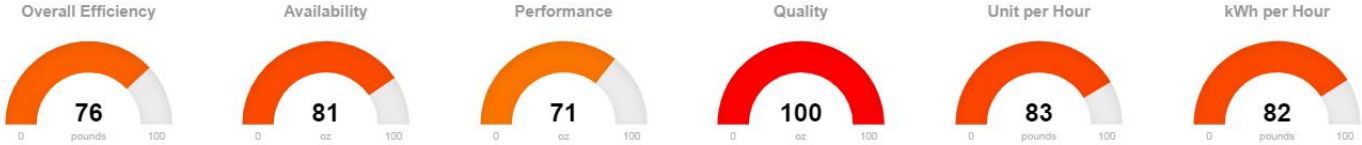


ABB Ability for Pulp and Paper

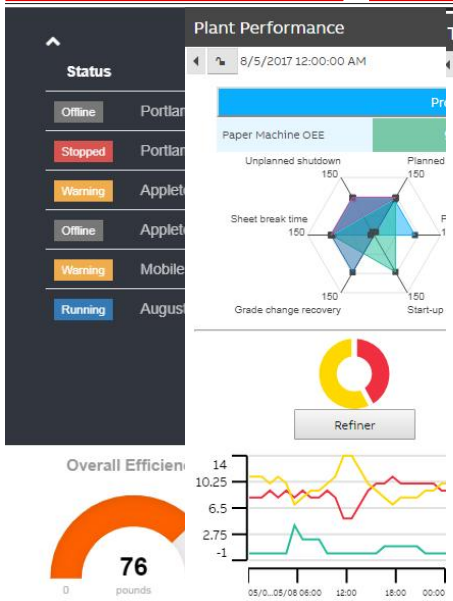
Turning insights into actions

Fleet → Plant

ABB Ability for Pulp and Paper

Turning insights into actions

Fleet → Plant → Machine



Technical KPIs for Process Performance

8/4/2017 12:00:02 AM — 8/5/2017 12:00:02 AM

	SHIFT A	SHIFT B	SHIFT C	DAY
OME(OR OEE)	47.15 %	87 %	86.95 %	82.31 %
Uptime	75	87	86.49	82.33
Salable product	75 %	87 %	70.89 %	79.42 %
Headbox consistency	1 %	1 %	1 %	1 %
White water consistency	0.77 %	0.21 %	0.6 %	0.61 %
Couch vacuum	1 cfm/sq	1 cfm/sq	1 cfm/sq	1 cfm/sq
Consistency off couch	14 %	23 %	16.62 %	16.62 %
Consistency after last press	19 %	37 %	27.73 %	26.98 %
Steam consumption (if applicable)	1.35 lb steam/ lb paper	1.23 lb steam/ lb paper	1.84 lb steam/ lb paper	1.27 lb steam/ lb paper
Dryer steam consumption	1.42 lb steam/lb water	1.81 lb steam/lb water	1.4 lb steam/lb water	1.53 lb steam/lb water
Total steam consumption	8197 lb steam/lb paper	5028 lb steam/lb paper	7067.39 lb steam/lb paper	6943.41 lb steam/lb paper
TAPPI drying rate	4.72 lb water/hr/ft	1.12 lb water/hr/ft	4.31 lb water/hr/ft	3.75 lb water/hr/ft
Total energy consumption	84 MBTU/ton paper	87 MBTU/ton paper	85.07 MBTU/ton paper	84.15 MBTU/ton paper
Conditioned weight peak-to-peak & 2-sigma	1 lb paper	1 lb paper	1 lb paper	1 lb paper
Moisture peak-to-peak & 2-sigma	1 %	1 %	1 %	1 %
Averaged conditioned weight & moisture	0.69	0.83	0.56	0.75
Total water consumption	28152 1k gallon/ton paper	25143 1k gallon/ton paper	16938.3 1k gallon/ton paper	23881.28 1k gallon/ton paper

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ABB Ability for Pulp and Paper

Turning insights into actions

Fleet → Plant → Machine → Control

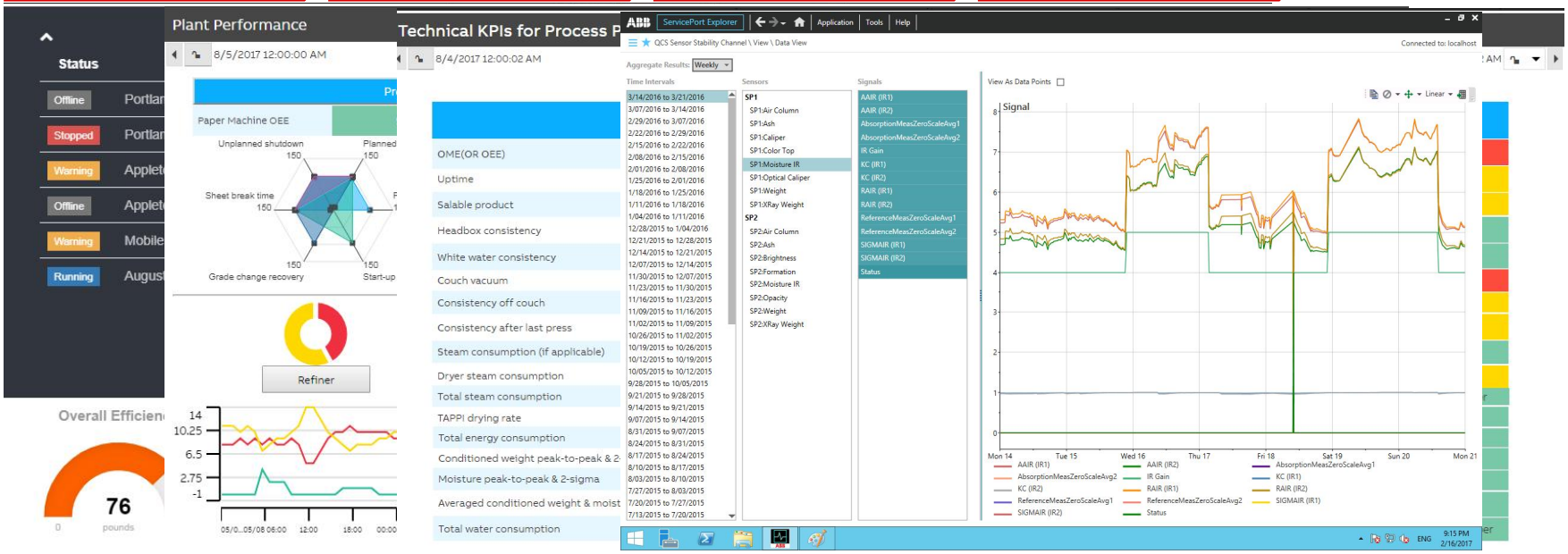

ABB Ability for Pulp and Paper

Turning insights into actions

Fleet → Plant → Machine → Control → Equipment

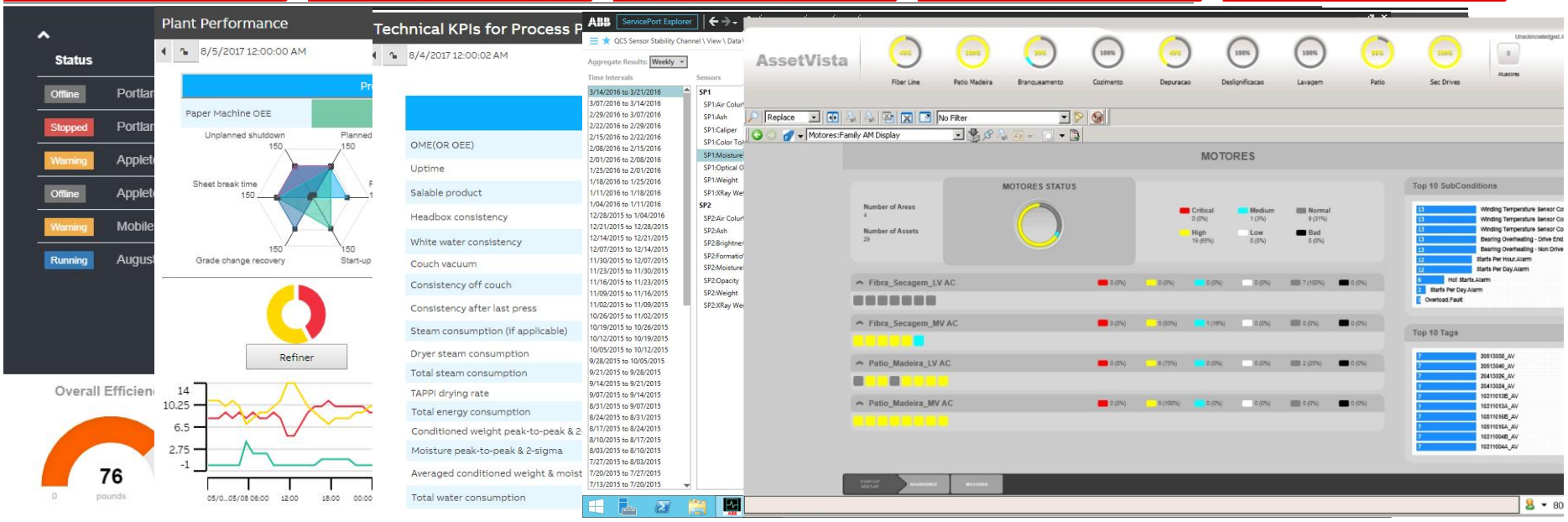

ABB Ability™ Collaborative Operations

Features, Benefits & Business Impact

Paper Machine Performance

Features

- OEE monitoring
- PM/Technical KPI optimization
- Daily performance check
- Action recommendation and execution

Benefits

- Grade change improvement
  - Quality improvement
  - Sheet break reduction
- Start-up time reduction

Expected business impact: **500 KUSD+ / year**

QCS Sensor Performance

Features

- Continuous analysis of Sensor KPIs
- Daily performance check
- On demand analysis
- Action recommendation and execution

Benefits

- Improved paper quality

Est. Business Impact: **200 KUSD+ /year**

We Have Long History in CPM

Creating value for our customers since 1975

ABB's Experience in CPM for P&P:

- First production tracking system 1975
- First energy management system 1978
- First quality management system 1982
- First trim optimization system 1982
- First production planning system 1993

Over 200 installed systems for Pulp and Paper

Supplier	Rank 2014	Rank 2012
ABB	1	1
OSIsoft	2	3
Honeywell	3	2
Schneider Electric	4	4
Siemens	5	7
Rockwell Automation	6	5
Aspen Technology	7	6
Emerson Process Management	8	8
SAP	9	8

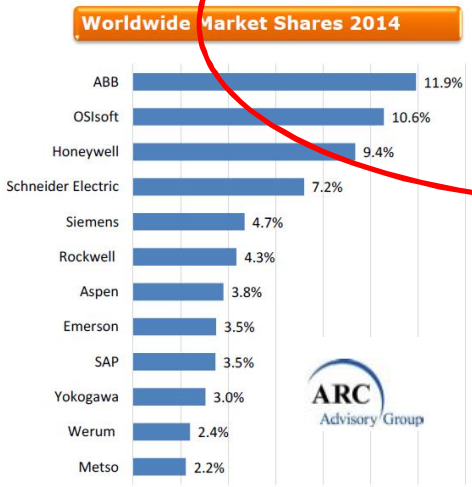

ABB is the market leader in CPM for Process Industries

Thank You For Your Attention!

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