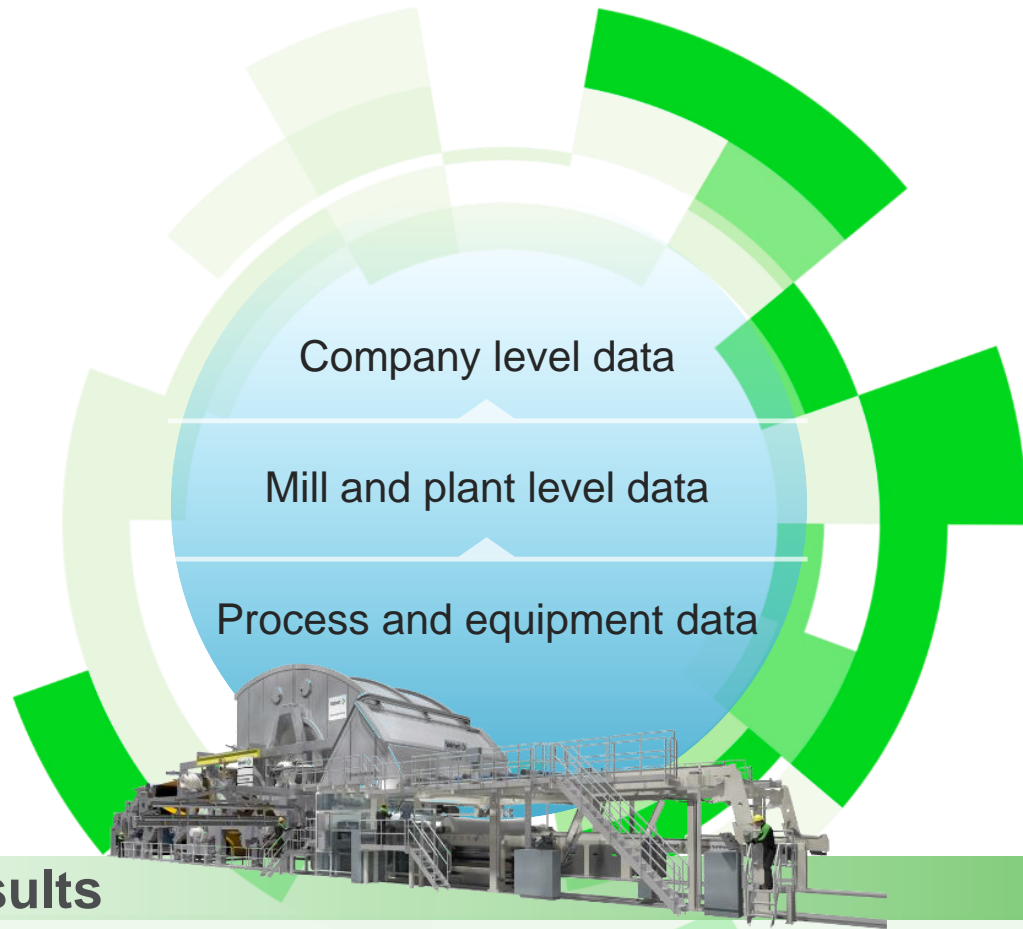




# Valmet Industrial Internet Leveraging Big Data Analytics on Tissue Machines

# Valmet Industrial Internet

## A dialogue with data



### Dialogue with data:

- Combining process and business data from different mill or plant systems
- Leveraging advanced analytics and Valmet's know-how to create new data driven applications & services
- Providing applications for operator assistance and new set points for the automation system

### Results

➤ Reduced raw material and energy cost

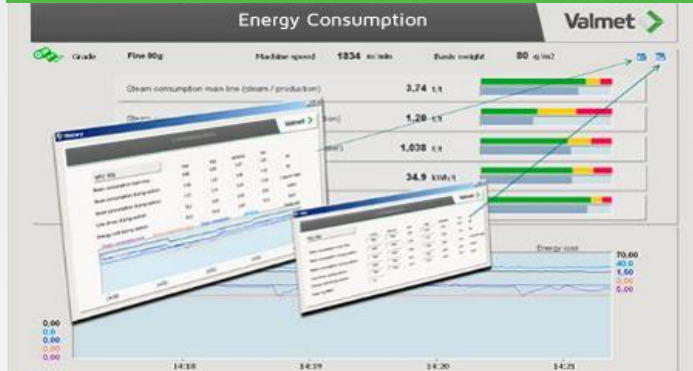
➤ Reduced downtime and unplanned stops

➤ Improved product quality



# Key elements of Valmet Industrial Internet

## Industrial Internet applications



From analytical applications for reliability and performance to Advanced Process Controls, information management and process simulators

## Valmet Performance Center



Provides remote support, monitoring and data analysis and access to Valmet's expert network

## Valmet Customer Portal



A digital, personalized collaboration space between you and Valmet

## Intelligent machines and automation



A solid data source for Industrial Internet solutions

## Solution ecosystem

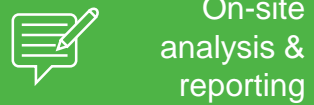
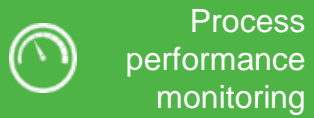


Brings leading industry players and innovative start-ups together to co-create new value-adding data driven services

# Valmet Industrial Internet offering

Applications and services for Tissue producers

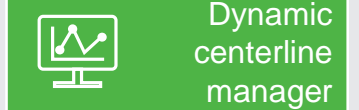
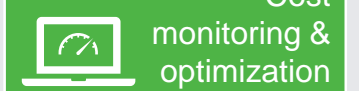
## Advanced reporting and guidance



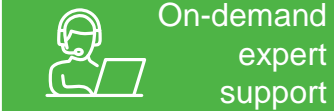
## Asset reliability optimization



## Operations performance optimization



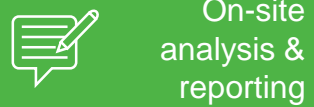
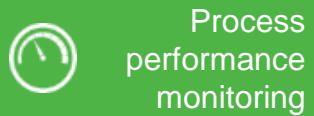
## Valmet Performance Center



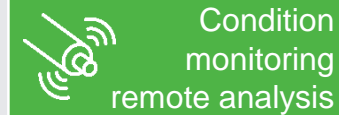
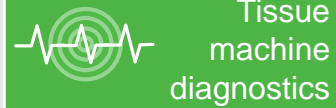
# Valmet Industrial Internet offering

Applications and services for Tissue producers

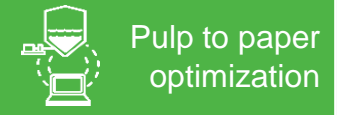
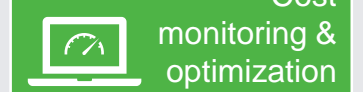
## Advanced reporting and guidance



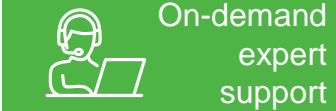
## Asset reliability optimization



## Operations performance optimization



## Valmet Performance Center



# Real time quality prediction

## Paper and board properties modelling for optimized quality



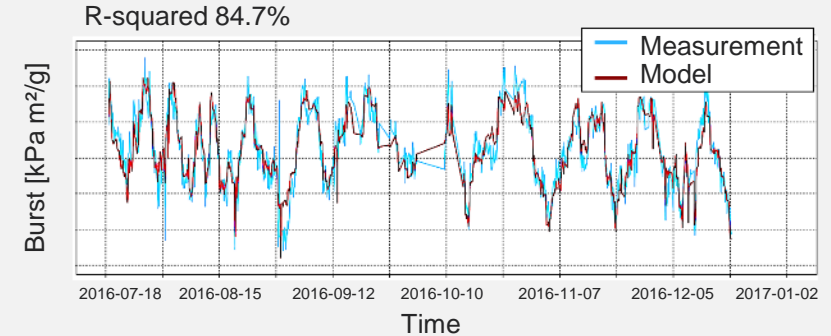
### Service description

- Collecting large data set of process and/or analyzer data
- Modelling and predicting final paper and board properties. Modelled variables include:
  - Paper and board properties: SCT index, CMT index, bulk, burst strength index, tensile, tear, internal bond, porosity
- Quality models and predictions are implemented online and visualized for operators

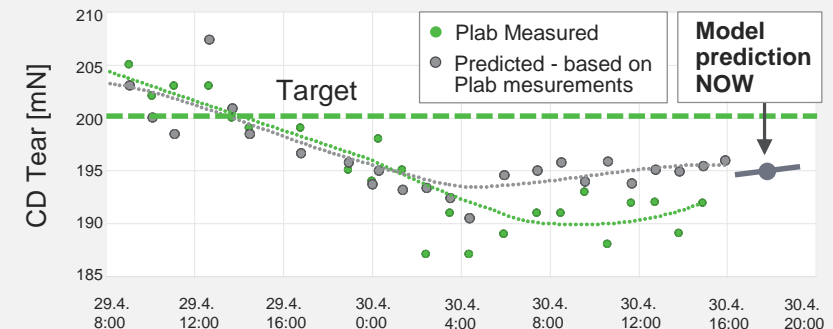
### Benefits

- Online strength information
- More stable final product quality
- Online quality predictions help optimize raw material and chemical consumption, energy consumption and quality

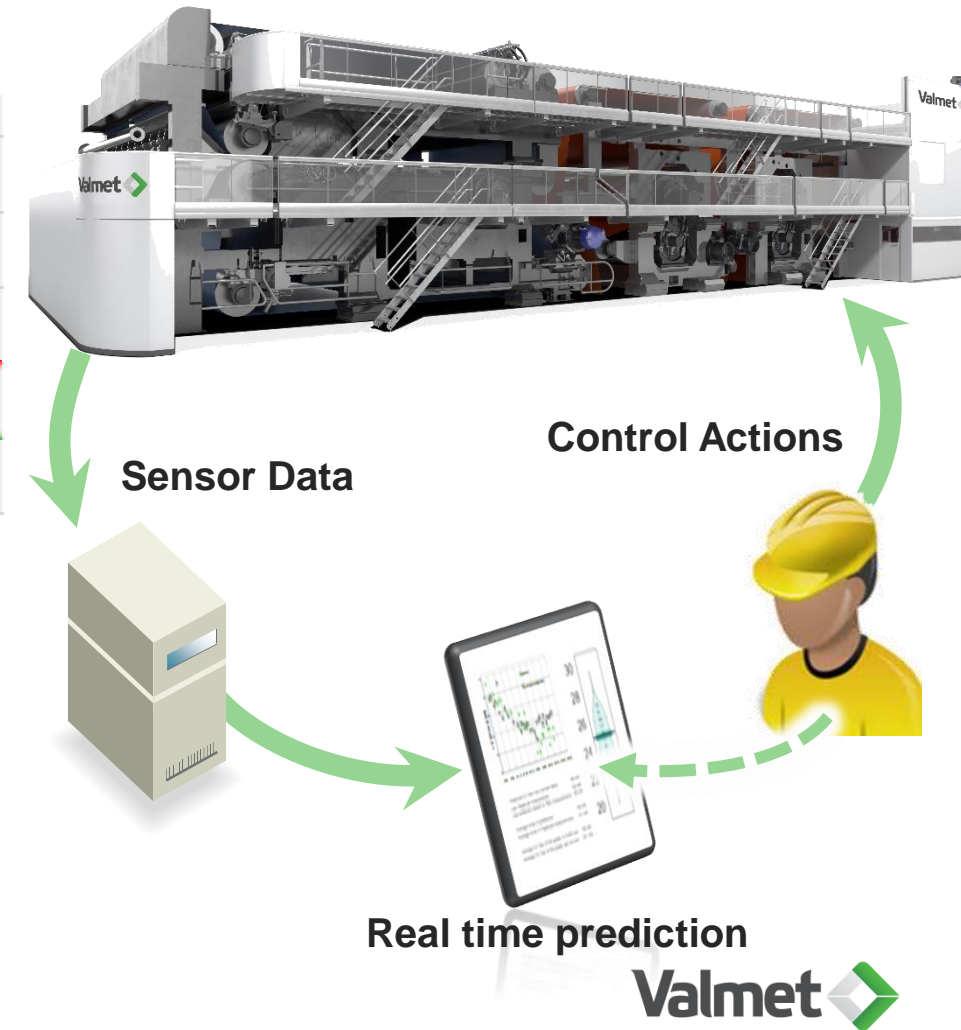
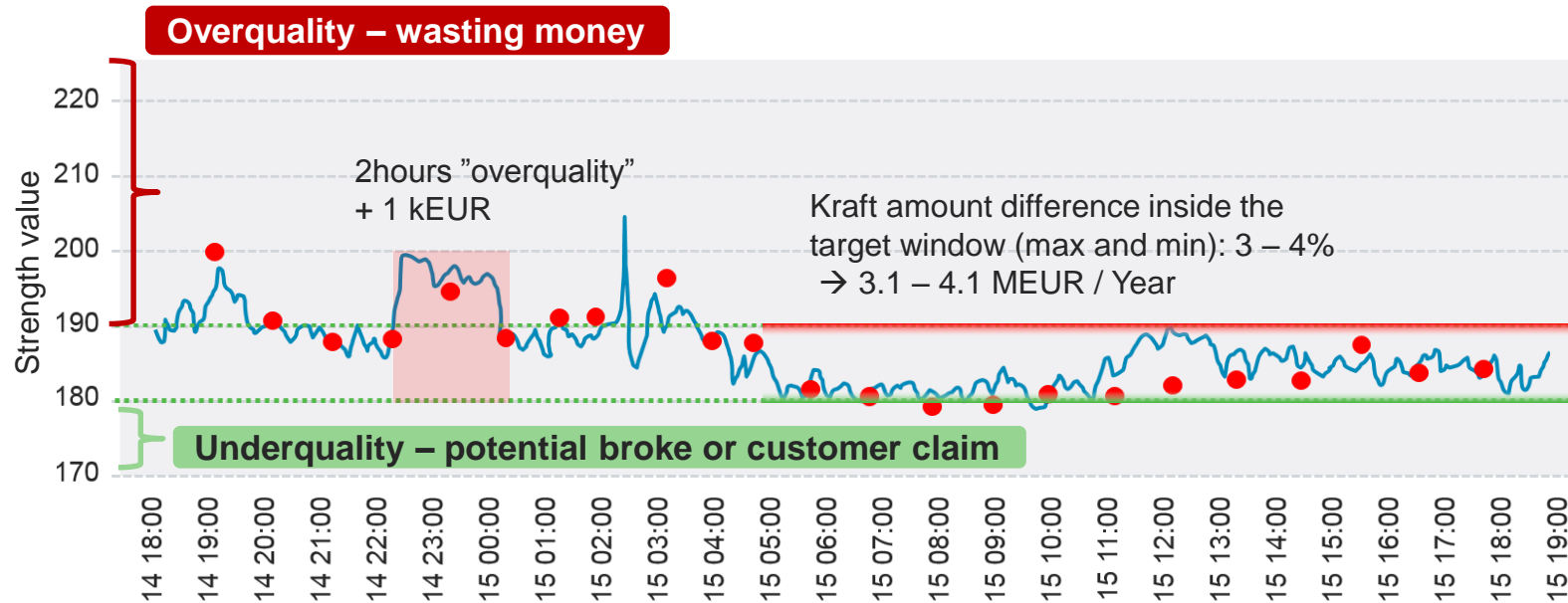
### Linerboard burst model vs process



### Magazine paper CD tear prediction



# Real time quality information for raw material savings





# Valmet Web Break Prediction

For better quality, higher production rate and less waste

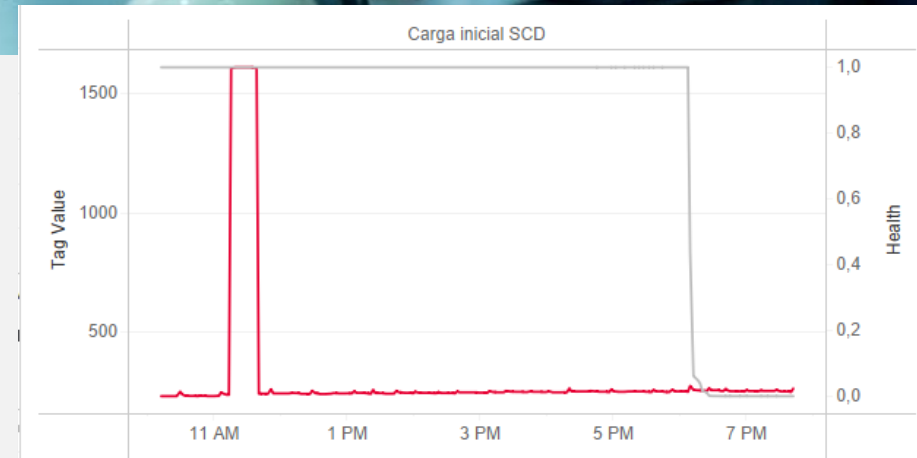


## Service description

- Using predictive technology, the operators are able to see potential breaks that are most likely to happen and can potentially avoid it.
- Behavior of sensors is analyzed using a predictive model that allows operators or automation personnel make decisions that may prevent a break.
- The live data from the customer site is preprocessed, analyzed and run through Valmet's customized models in order to provide live guidance on avoiding web breaks.

## Benefits

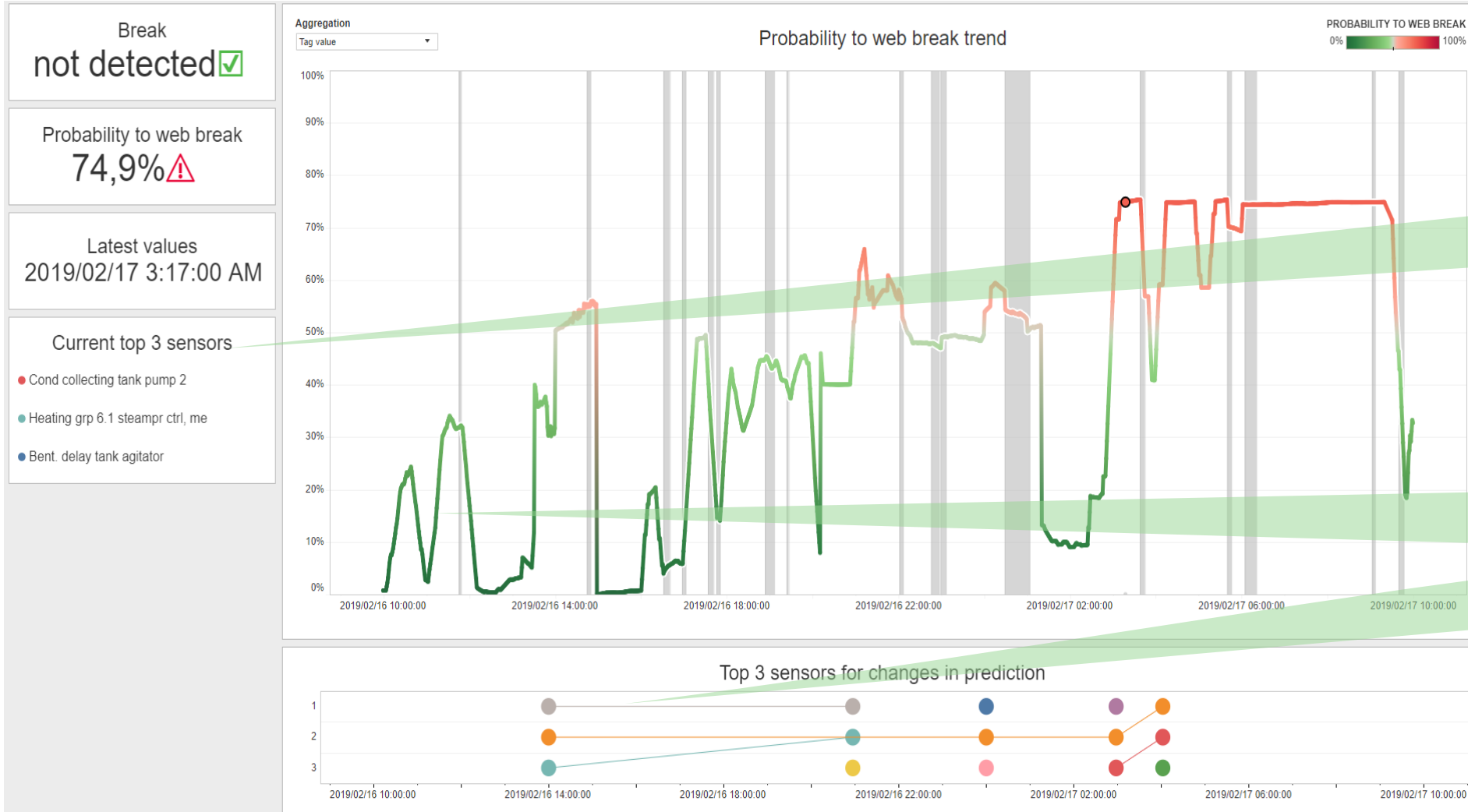
- Decreased breaks mean better quality, higher production rate and less waste.
- As the system improves, it is possible to move towards fully automated closed loop control.
- Value of a single web break application for a single mill can range from 1.5 to 4 M\$ on a yearly basis



The most important measurements which cause the break is indicated relative to a grey health score of line



# Valmet Web Break Prediction – Application screenshot



Top 3 most important measurements driving break probability

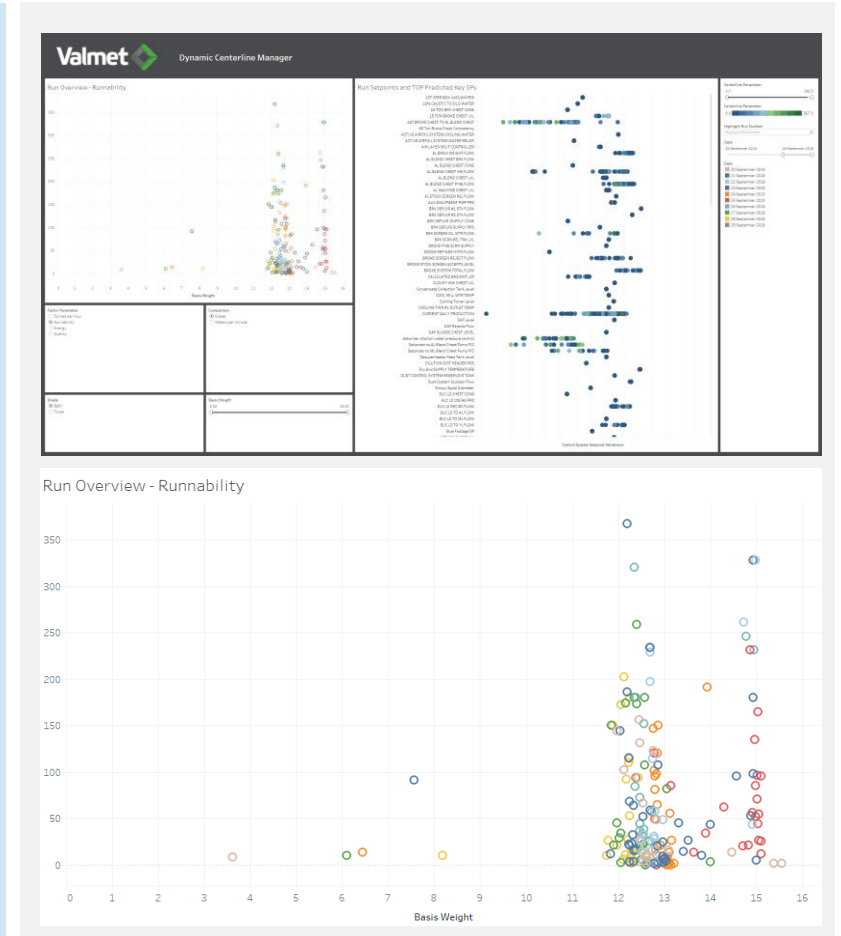
Health score

What changes in the measurements cause the change in health score

# Dynamic centerline manager

## Service description

- Visualize variables which explain machine runnability
- By understanding the process interactions we can have influence on several things in the process such as quality, cost/ton, continuous runtime/run, daily production and energy consumption
- Pinpoints areas that require development and maintenance work in the process
- Can teach operators and production workers to change their production and running modes on the machine to achieve the goals set
- Provides detailed information about the cause and effect relationship of changes made in the process' setups.
- Application explains grade-specific runtimes on a daily level
- Shows the most important variables that could predict breaks in the machine



# Today, customers are extensively utilizing our Industrial Internet capabilities

