

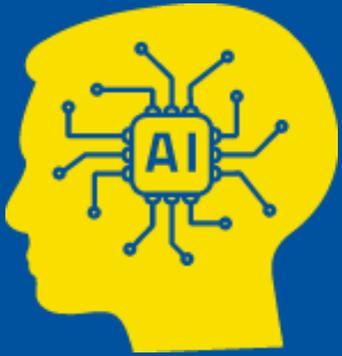
# AI Suite for HYDRA X & FEDRA

Artificial Intelligence (AI) in the Smart Factory



Do you actually know  
how **valuable your data** is  
– in monetary terms and with regard to information?

Take advantage of **opportunities** in your Smart Factory  
from the wealth of your data!



**Artificial intelligence (AI)** makes this possible!



Motivation



"We collect an **awful lot of data** with our manufacturing IT, but I have this uneasy feeling that we do not make the **most of it**. How can **AI** help us in this undertaking?"

"Everybody is talking about artificial intelligence but **how can we benefit in production?** We will certainly not invest because it sounds so cool."

"Artificial intelligence sounds **innovative**, but I bet it's also **extremely complicated**, right?"



**Your Issue**

## The AI Suite for HYDRA X & FEDRA ...

- ... provides artificial intelligence in innovative standard applications.
- ... uses data that you already have or collect.
- ... can do without a data scientist.
- ... generates new insights in a flash.
- ... supports you in daily business routines to get even better.
- ... boosts your competitiveness.
- ... safeguards your future viability.



**Our Solution**

## Planning

AI Planning

AI  
Workforce Planning

AI-based  
Setup Time  
Prediction



# AI Suite

## Resource Management

AI-based  
Machine Status Analysis

AI-based  
Capacity Utilization  
Analysis

AI-based Resource  
Performance Account  
Analysis

AI-based  
Machine Performance  
Analysis

AI-based  
OEE  
Analysis

AI-based  
Quality Failure Analysis

Predictive Quality

## Quality Management

AI-based  
Setup Rate  
Analysis

AI-based  
Scrap  
Analysis

AI-based  
Scrap Reason  
Analysis

## Order Management

# AI Suite for HYDRA X & FEDRA

Perfect production results need perfect planning!



## AI Planning

## Reduce production costs and increase on-time delivery!

- Automatically schedule orders, tools and other resources efficiently according to targets.
- Consider all boundary conditions (e.g. dependencies, bottlenecks of machines, ...).
- Set target values for optimization yourself.
- Get holistic planning results.

## Artificial intelligence at work

- Reinforcement Learning
- Optimization



AI Planning

# Counteract shortage of skilled labor!



## AI Workforce Planning

## Make optimal use of your available workforce!

- Schedule employees according to their qualifications in the best possible way.
- Automatically create deployment plans as accurate as possible.
- React quickly to changed conditions.

## Artificial intelligence at work

- Reinforcement Learning
- Optimization



# AI Workforce Planning

Realistic planning is only possible with realistic default values!

AI-based setup time prediction

AI-based setup time prediction

Drag a column here to group by that column

Setup change matrix							Setup time prediction			
Group	Workplace	Type	From	To	Additional setup time	Ignore static setup time	Additional setup time	Ignore static setup time	Deviation [%]	
60610	Tool	B-4026-29-6	B-8927-29-1		0:20:00	<input type="checkbox"/>	0:17:45	<input type="checkbox"/>	-11.25%	
60610	Tool	B-8927-29-3	B-8927-29-5		0:12:00	<input type="checkbox"/>	0:11:38	<input type="checkbox"/>	-3.00%	
60610	Tool	B-9901-01-7	B-8927-29-6		0:35:00	<input type="checkbox"/>	0:37:58	<input type="checkbox"/>	8.48%	
60610	Tool	B-8018-29-6	B-8927-29-2		0:30:00	<input type="checkbox"/>	0:20:43	<input type="checkbox"/>	-30.94%	
60612	Tool	DGF-L-FFU021	DGF-R-OCC0021		0:08:00	<input type="checkbox"/>	0:08:21	<input type="checkbox"/>	4.38%	
60612	Tool	DGF-R-VGO021	DGF-L-VGO021		0:11:00	<input type="checkbox"/>	0:10:21	<input type="checkbox"/>	-5.91%	
60612	Tool	DGF-L-OAS021	DGF-L-VPO021		0:15:00	<input type="checkbox"/>	0:12:44	<input type="checkbox"/>	-15.11%	
60612	Tool	DGF-L-VPO021	DGF-L-FKA021		0:40:00	<input type="checkbox"/>	0:42:11	<input type="checkbox"/>	5.46%	
60612	Tool	DGF-L-VPO021	DGF-L-FFX021		0:10:00	<input type="checkbox"/>	0:09:09	<input type="checkbox"/>	-8.50%	
60614	Tool	B-9901-01-7	B-8927-29-6		0:35:00	<input type="checkbox"/>	0:37:58	<input type="checkbox"/>	0.00%	
60614	Tool	SW-100X8	SW-20X8		0:03:00	<input type="checkbox"/>	0:03:23	<input type="checkbox"/>	12.78%	
60614	Tool	SW-100X8	SW-20X7		0:30:00	<input type="checkbox"/>	0:37:11	<input type="checkbox"/>	23.99%	
60614	Tool	SW-100X8	SW-30X8		0:18:00	<input type="checkbox"/>	0:17:12	<input type="checkbox"/>	-4.44%	
60614	Tool	B-9901-01-7	B-8927-29-6		0:06:00	<input type="checkbox"/>	0:05:38	<input type="checkbox"/>	-6.11%	
60614	Tool	SW-40X6	SW-4026-12		0:27:00	<input type="checkbox"/>	0:26:22	<input type="checkbox"/>	-2.35%	
60623	Tool	SW-40X6	SW-4026-12		0:27:00	<input type="checkbox"/>	0:26:22	<input type="checkbox"/>	-13.42%	
60623	Tool	SW-40X6	SW-4026-12		0:27:00	<input type="checkbox"/>	0:26:22	<input type="checkbox"/>	6.59%	
60623	Tool	SW-40X6	SW-4026-12		0:27:00	<input type="checkbox"/>	0:26:22	<input type="checkbox"/>	29.72%	
60623	Tool	SW-40X6	SW-4026-12		0:27:00	<input type="checkbox"/>	0:26:22	<input type="checkbox"/>	-6.57%	
60623	Tool	SW-40X6	SW-4026-12		0:27:00	<input type="checkbox"/>	0:26:22	<input type="checkbox"/>	-9.43%	

Page 1 of 1 (20 items)

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# AI-based Setup Time Prediction

## Avoid the "master data hell" and use realistic default values!

- Calculate production times (setup, cycle, ...) based on historical data.
- Analyze diverse influencing factors.
- Provide (automatic) planning with **realistic** default values.

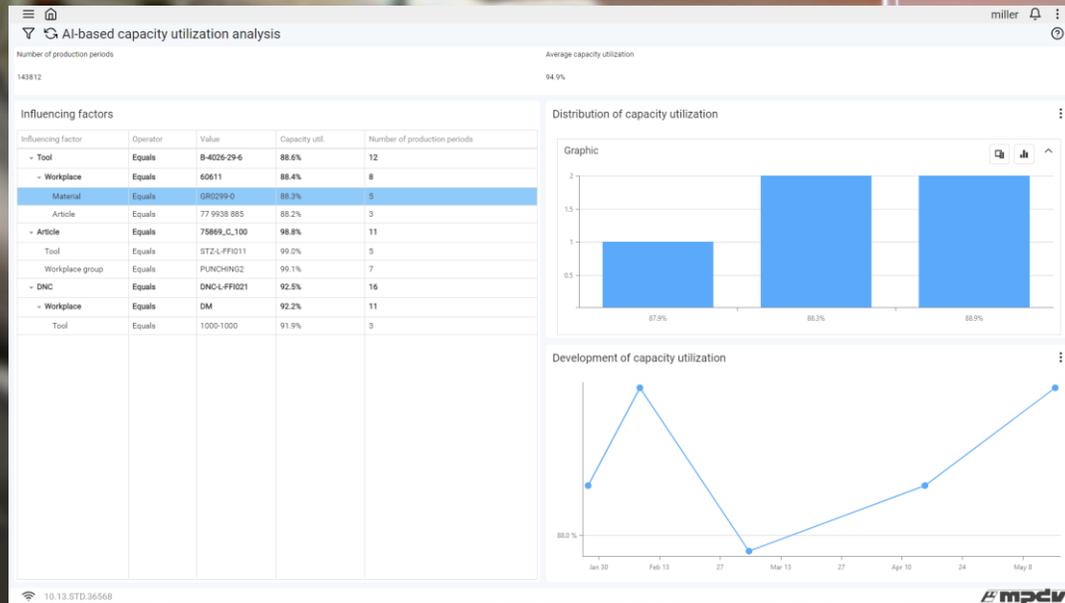
## Artificial intelligence at work

- Unsupervised Machine Learning
- Pattern Recognition



# AI-based Setup Time Prediction

Only if you know where it's stuck, you can fix it!



# AI-based Capacity Utilization Analysis

## Understand correlations for fluctuations in capacity utilization!

- Analyze and recognize diverse influencing factors.
- Show and analyze developments over time.
- Take and validate measures.

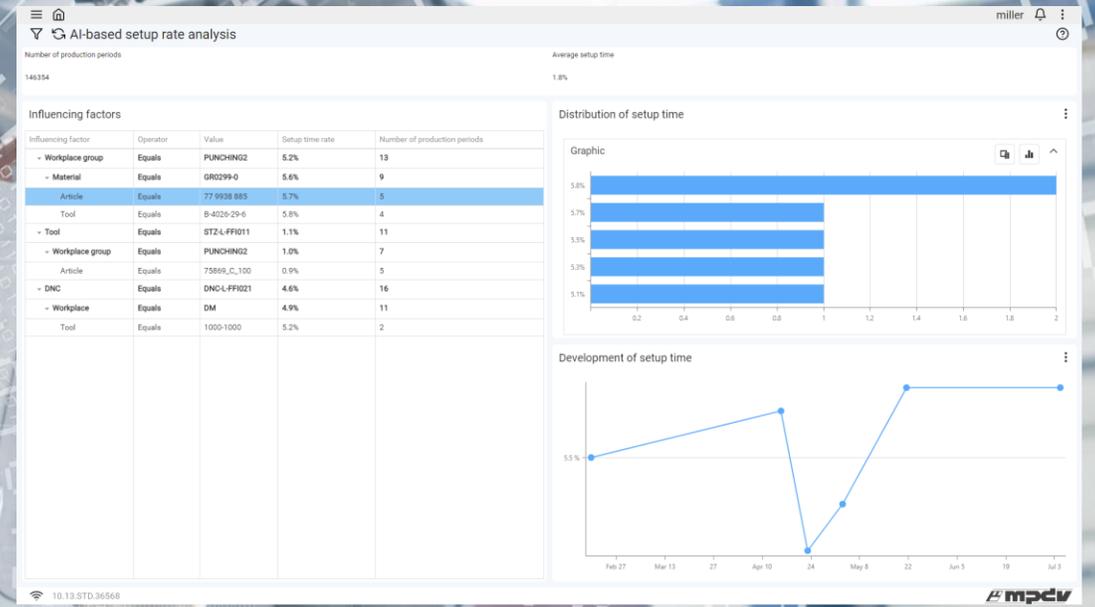
## Artificial intelligence at work

- Unsupervised Machine Learning
- Pattern Recognition



# AI-based Capacity Utilization Analysis

Yes, setup times are unproductive, but can't be avoided!



# AI-based Setup Rate Analysis

## Understand correlations for high setup rates!

- Analyze factors influencing the setup rate.
- Optimize setup processes.
- Save time and costs.

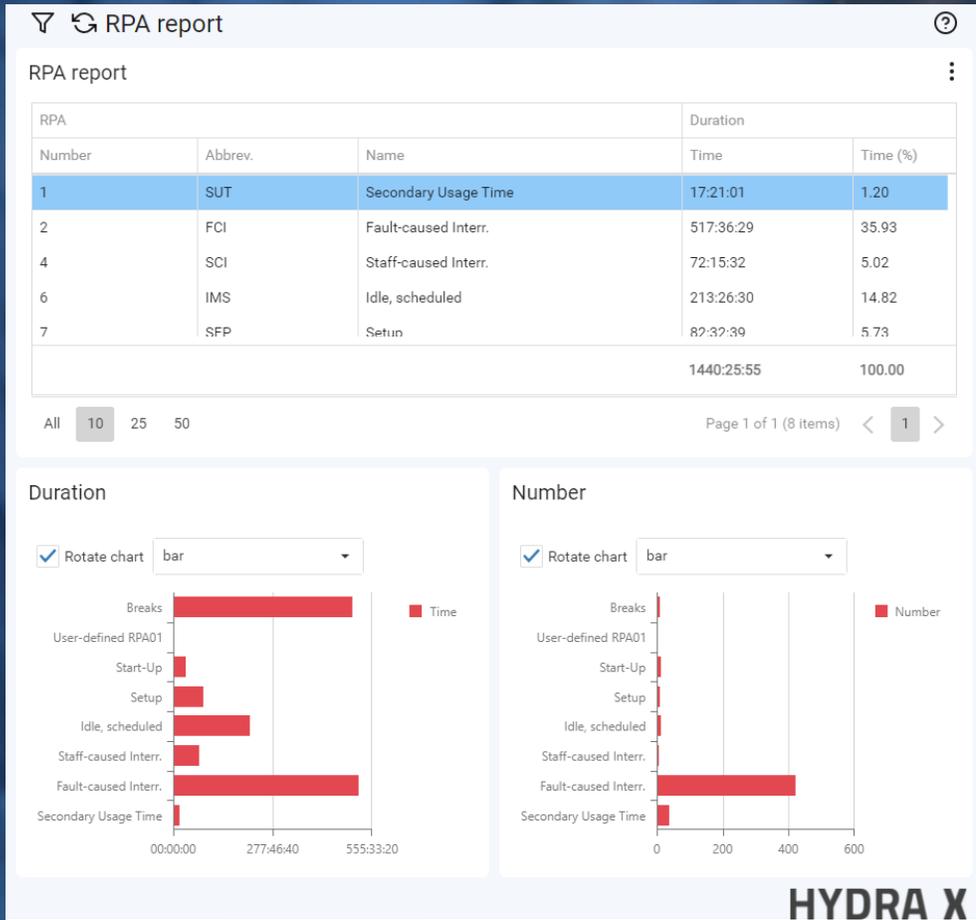
## Artificial intelligence at work

- Unsupervised Machine Learning
- Pattern Recognition



# AI-based Setup Rate Analysis

How, what, when and why – the more you know, the better it runs!



# AI-based Resource Performance Account Analysis

## Understand correlations why specific events occur!

- Uncover hidden dependencies.
- Recognize influencing factors and make them transparent.
- Reduce unproductive times.

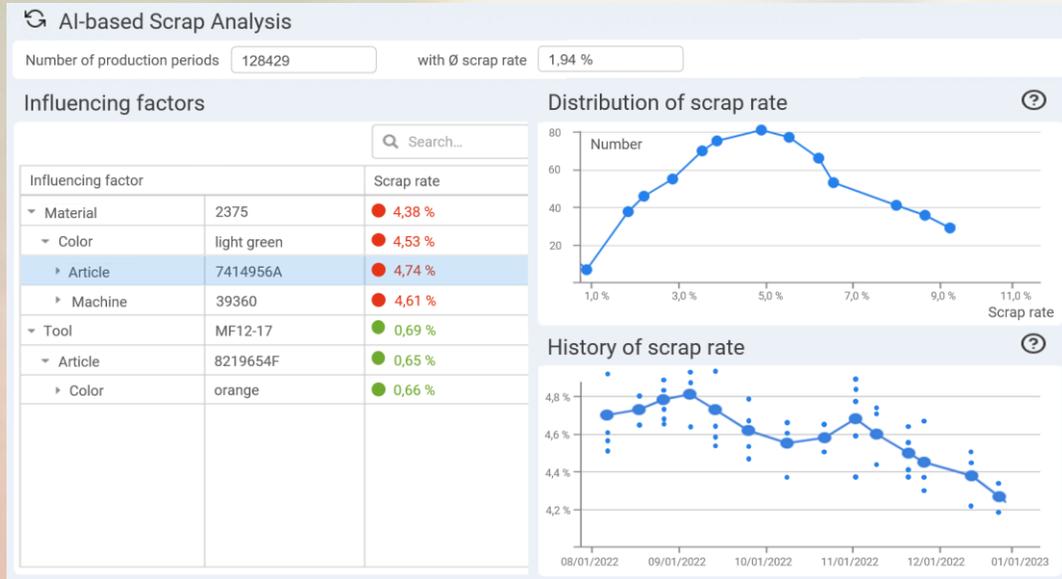
## Artificial intelligence at work

- Unsupervised Machine Learning
- Pattern Recognition



# AI-based Resource Performance Account Analysis

Learn from your mistakes and increase your quality!



# AI-based Scrap Analysis

## Understand the cause of scrap!

- Analyze diverse influencing factors.
- Recognize dependencies.
- Gain new insights and build knowledge.
- Gradually improve quality.

## Artificial intelligence at work

- Unsupervised Machine Learning
- Pattern Recognition



# AI-based Scrap Analysis

You can't predict the future? No worries – AI does it for you!

**PREDICTIVE  
QUALITY**



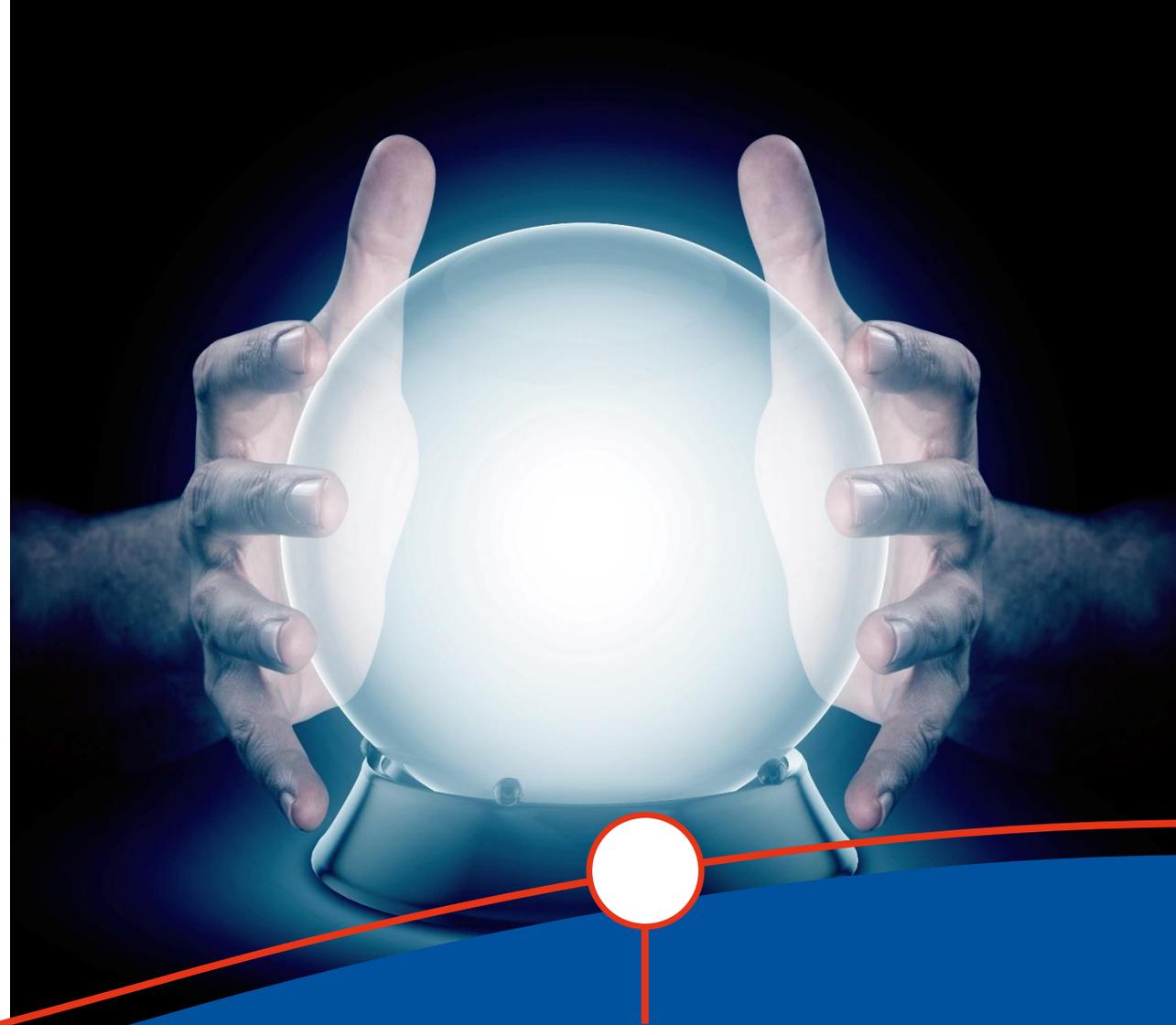
**Predictive Quality**

## Predict quality and evaluate workpieces without inspection!

- Use historical process & quality data
- Evaluate quality of semi-finished products at an early stage.
- Evaluate products non-destructively.
- Reduce inspection efforts.

## Artificial intelligence at work

- Unsupervised Machine Learning
- Real-time prediction model



**Predictive Quality**

Profit from your **most valuable asset** – **your data!**

With the AI Suite for HYDRA X and FEDRA you  
safeguard your **competitiveness!**



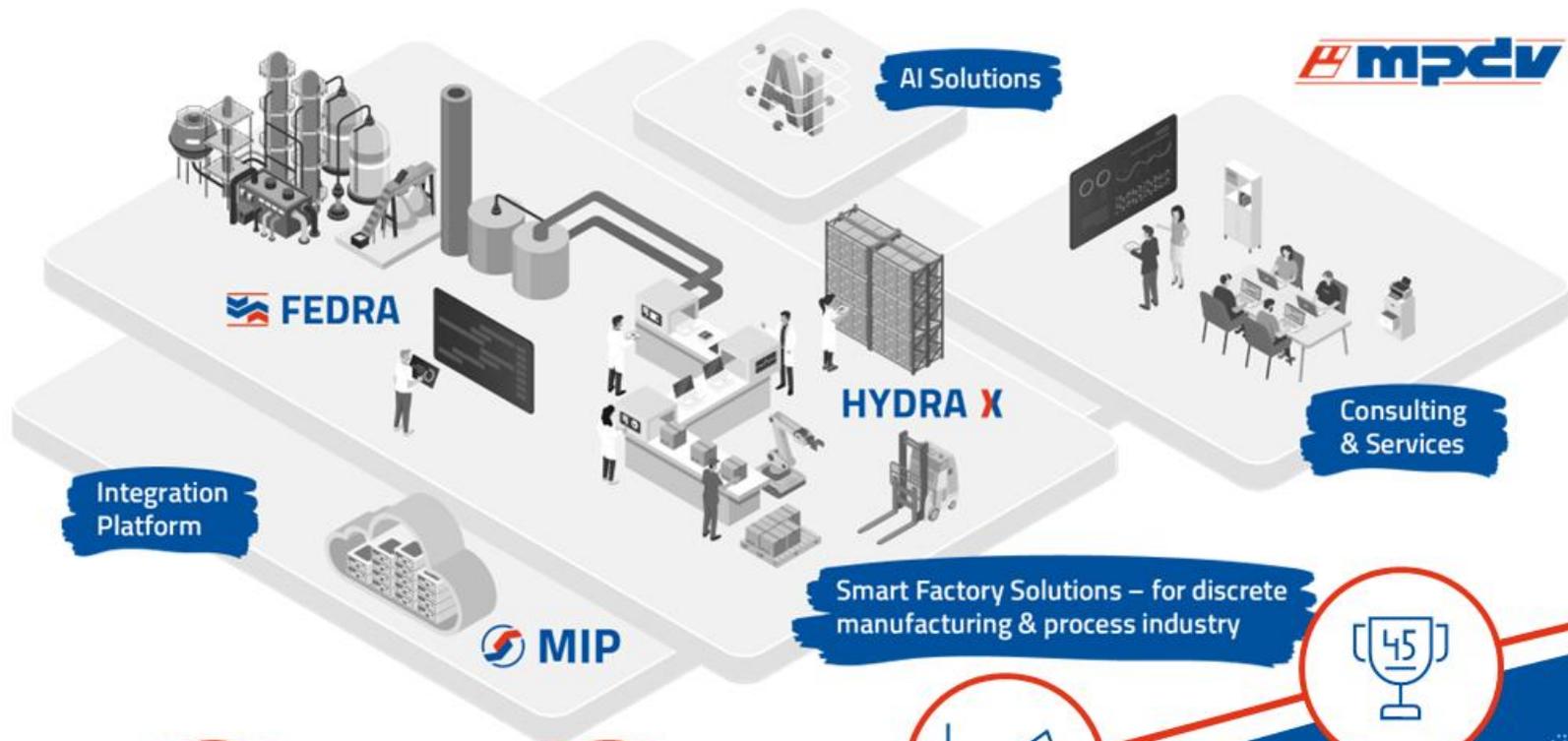
**Profit Now!**

A photograph of a modern industrial building complex. The main building is white with blue accents and a large glass facade. A blue sky with white clouds is visible in the background. A red line graphic runs across the bottom of the image, ending in a white circle.

## About MPDV

WE CREATE SMART FACTORIES





people work with our solutions every day

**1.485.000**

installations in all industries

**2.430**



Worldwide present



**530**  
employees



**80 Mio.**  
euros  
group turnover



**45**  
years in the market &  
market leader for  
manufacturing IT



Would you like to find out more about  
the AI Suite for HYDRA X and FEDRA?



*WE CREATE SMART FACTORIES*



[www.mpdv.com](http://www.mpdv.com)



[info@mpdv.com](mailto:info@mpdv.com)



[+49 6261 9209 101](tel:+4962619209101)



**Contact**