HYPPOS

Advanced Material Tracking and Analytics
Next Generation Solutions for Process Industries

September 2025

Value Proposition

Boost revenue
through reduction of
production losses
by up to **40%**

* According to experience of our customers

Value Proposition

By leveraging HYPPOS, manufacturers can significantly enhance operational efficiency, ensuring substantial cost savings and increased revenue streams

Direct Benefits Range	Tonnes	€
Reduction of off-grade and increases of prime	880	€96,800
Reduction of Transition Loss	200	€46,000
Off-grade due to problems with MFR	220	€24,200
Reduction of loss due to shut-down and start-up	50	€5,500
Total	1,350	€172,500

* Benefits for average PP plant in EU (220kta)

Value Proposition

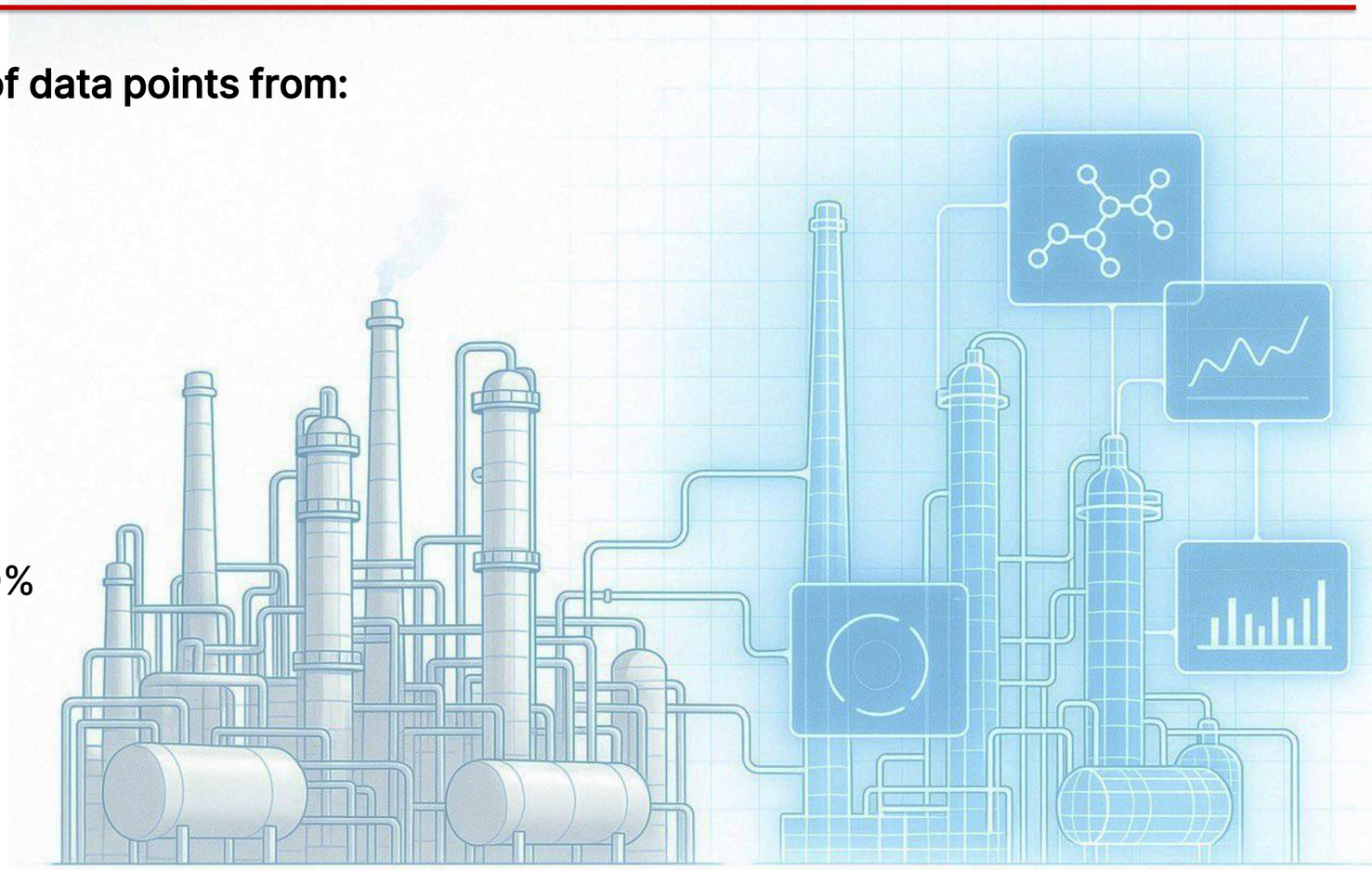
HYPPOS powers a Digital Twin of your chemical process,
driving the core of your Smart Factory transformation

It processes, combines and models thousands of data points from:

- DCS and LIMS systems
- Material Tracking powered by HYPPOS
- Online Analyzers
- Soft Sensors powered by HYPPOS
- 3rd party data models
- Users

In return it:

- Helps to lower production losses by up to 40%
- Predicts and tracks quality
- Traces material movements
- Digitalizes batch record
- Supports informed decisions



The Problem: The Digital Divide in the Process Industries

Operational Inefficiencies

Fragmented Data Systems

Lack of Real time Visibility

Reliance on Manual Processes

Result: 1 **Reduced Profits** 2 **Increased Waste**

Legacy Systems and manual processes hinder efficiency, visibility, and sustainability

The Solution: Bridging the Gap with Intelligent Integration

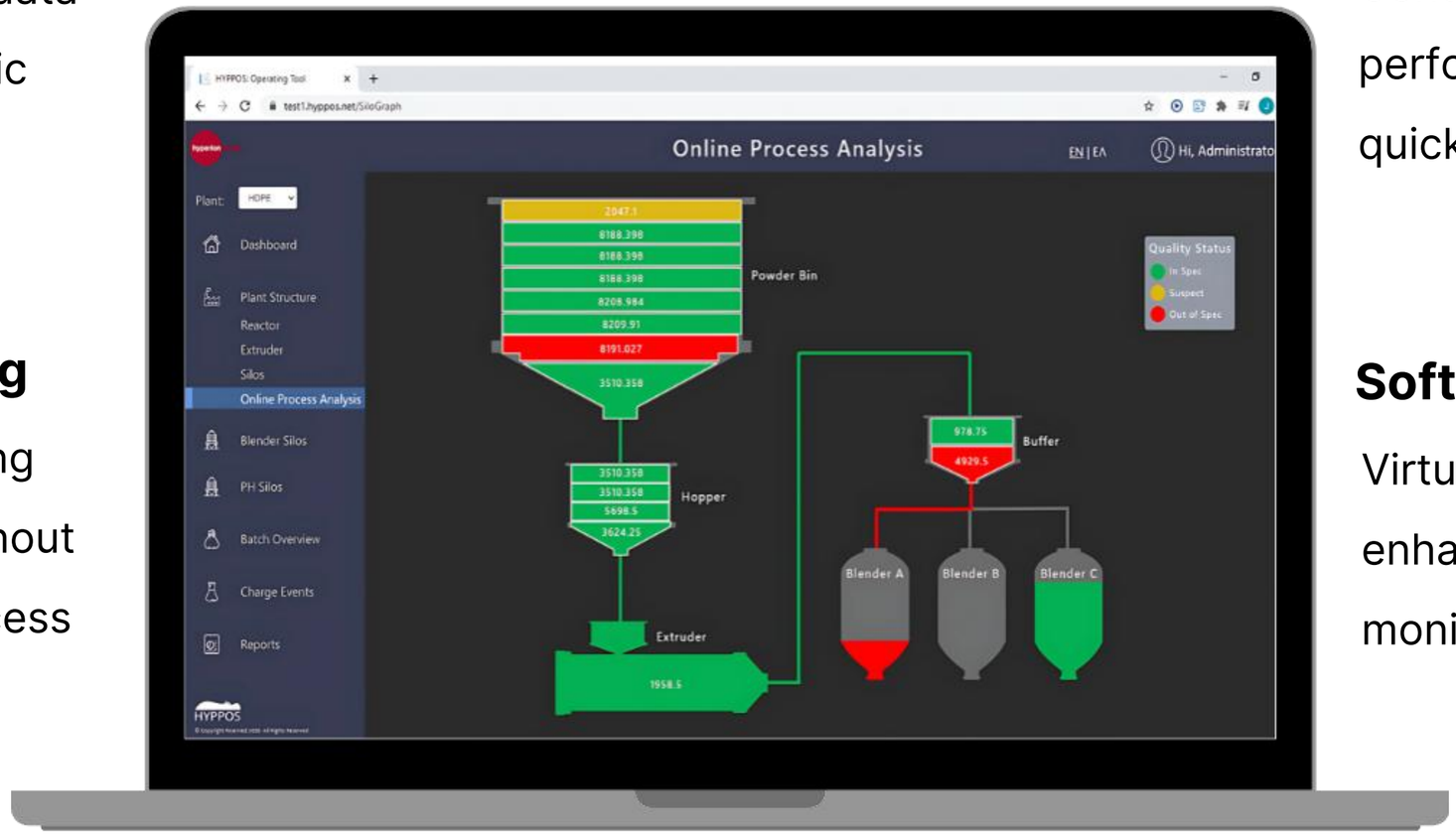
On-line Decision Support Tool

Data Consolidation

Unifying disparate data sources for a holistic view of operations

Material Tracking

Real-Time monitoring of materials throughout the production process



KPI Monitoring

Continuous tracking of key performance indicators for quick decision-making

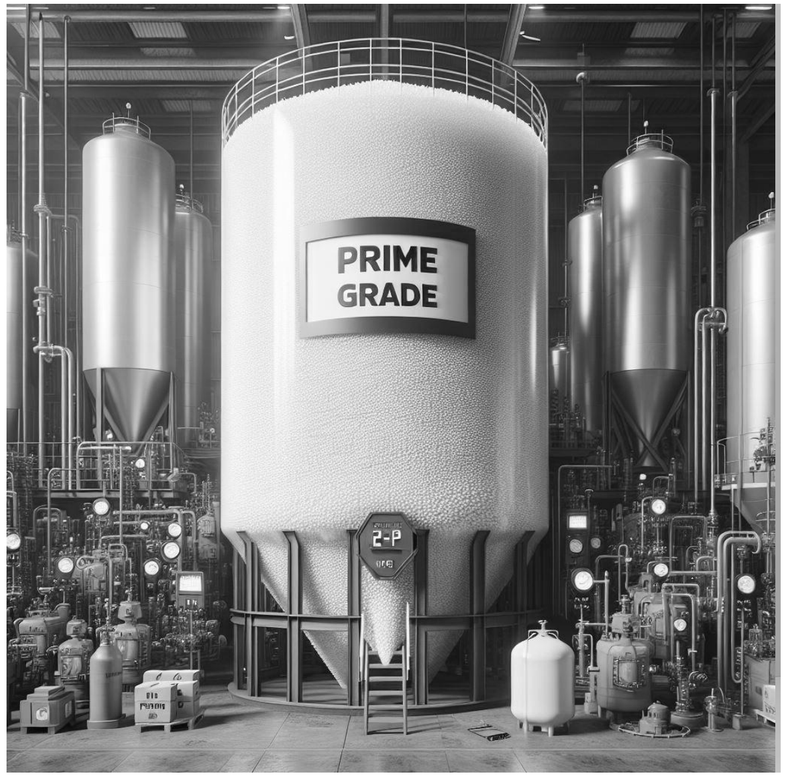
Software Sensors

Virtual sensors for enhanced process monitoring and control

Unifying data, predicting outcomes, and optimizing operations for a sustainable future

HYPPOS: How it Works

HYPPOS helps to achieve high-quality batches from the very first attempt — saving costs on rework, minimizing waste, and lowering CO2 footprint as result.



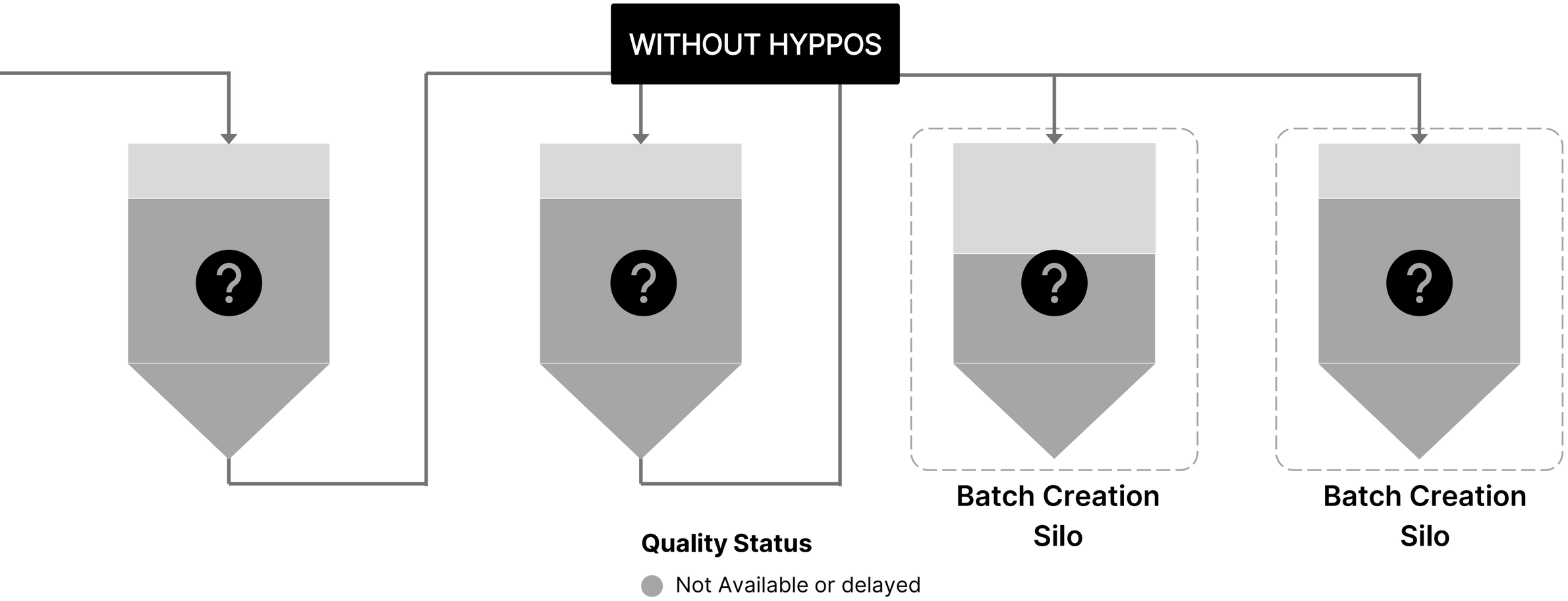
First-Attempt quality over:

1. Full transparency of the process through our unique Digital Twin
2. Predictive analytics through our unique AI/ML models
3. Streamlined traceability through data aggregation
4. Data driven and supported decisions

First-Attempt Quality: Maximizing Profit, Minimizing Waste

HYPPOS: How it Works

HYPPOS utilizes advanced algorithms of continuous flow discretization and AI/ML technologies to provide precise, real-time material tracking and quality monitoring throughout the entire continuous and semi-batch manufacturing processes



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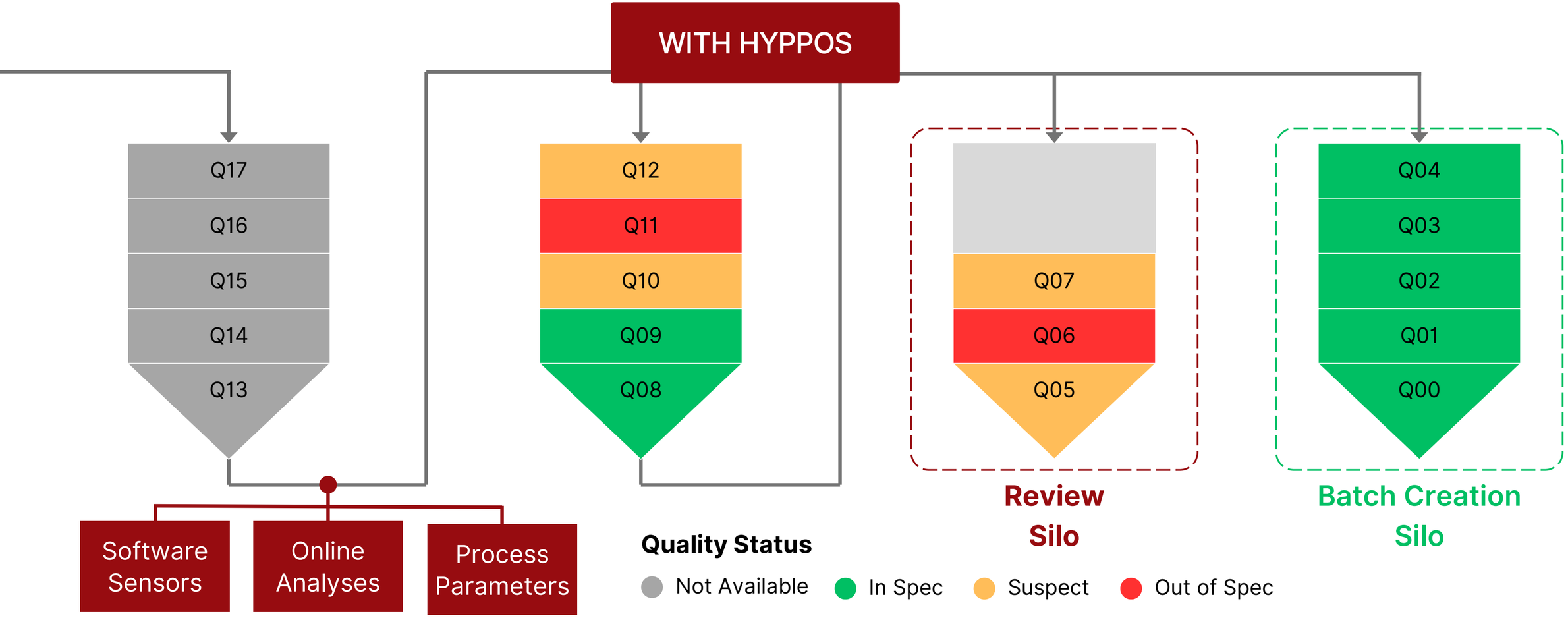


HYPPOS: Software Sensors

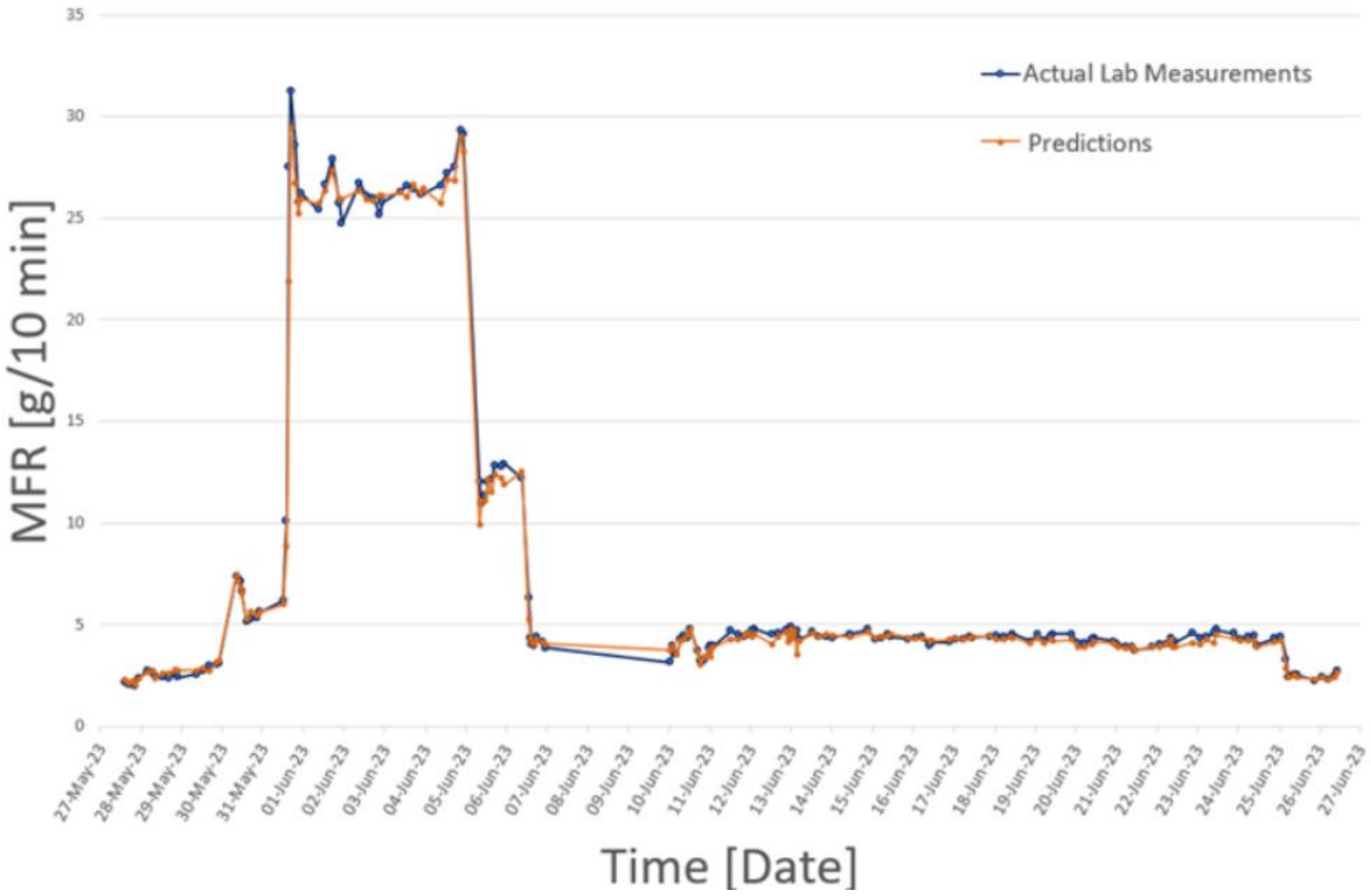
Software Sensors leverage AI/ML technologies to deliver real-time predictive insights, enhancing process optimization and reducing reliance on expensive physical sensors

	Software Sensors	Physical Sensors
Methodology	Uses **machine learning algorithms** to infer measurements from existing data	Utilizes hardware devices to directly measure physical properties
Cost	Low initial setup cost	High purchase cost
Maintenance	Minimal maintenance with **no downtime**, focused on software updates and algorithm improvements	Requires regular calibration and maintenance of hardware components
Flexibility	**Highly flexible**, can adapt to infer different types of measurements without additional hardware	Limited to specific measurements based on the installed hardware
Real-Time Analysis	Offers advanced **real-time analytics** using predictive models and machine learning	Provides real-time data, but is limited to the sensor's physical location and capabilities
Implementation	Faster implementation time as it leverages existing infrastructure and focuses on software deployment	**Longer implementation time** due to physical installation and setup requirements

We support MFR (Melt Flow Rate) and XS (Xylene Solubles) predictions in polypropylene (PP) production however the models can be adapted to different types of measurements

HYPPOS: Software Sensors

Comparison of Lab measurements and predictions given by Software Sensor:



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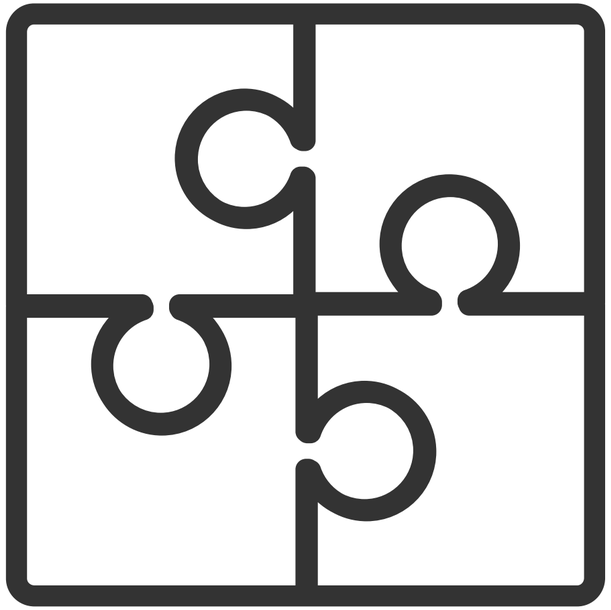
HYPPOS: Quick Adoption

HYPPOS is delivered fully configured to your site and ready to use typically in 3 months after project start



We ask you a few questions

We collect required data from you

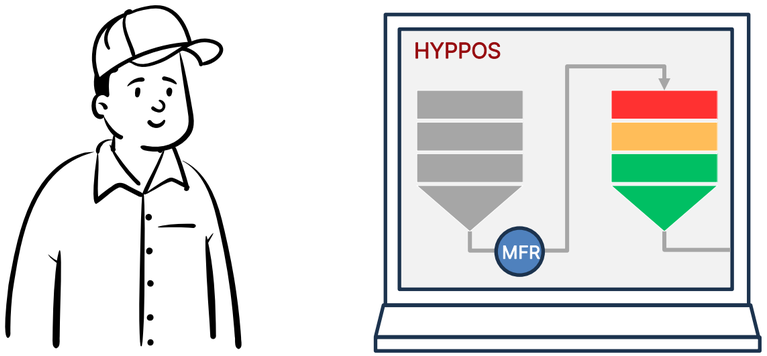
We configure Digital Twin and train models for you

We rollout the solution you can start using immediately

We provide support and deliver new features

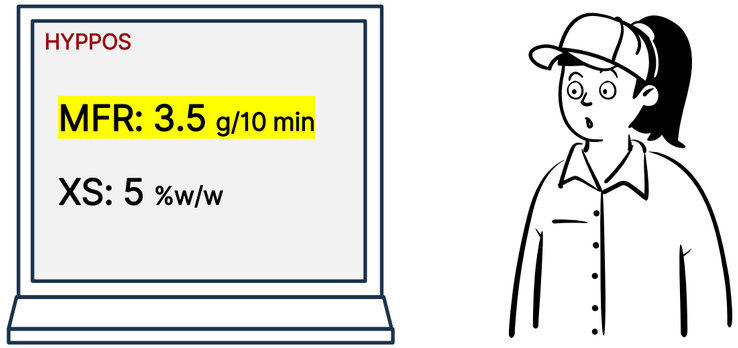
There is no need to hire dedicated specialists to develop, deploy, adjust and manage it from your side.
We cover all of these for you

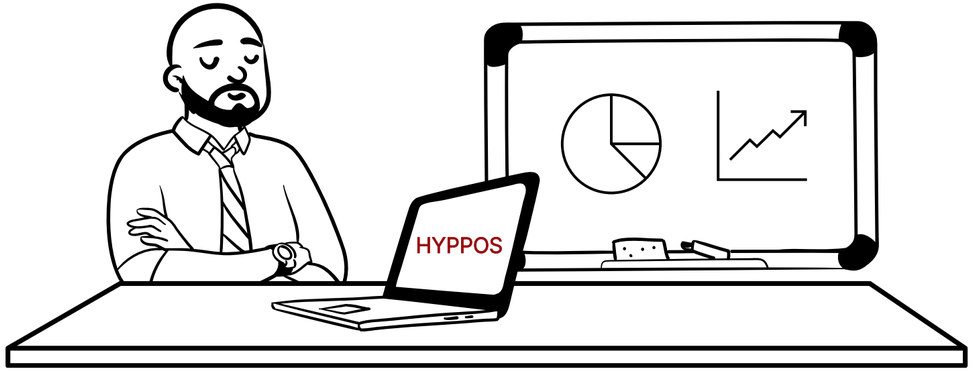
HYPPOS: Users



Fast reaction and decision making in shopfloor due to material tracking visualization and continuously predicted values of MFR and XS

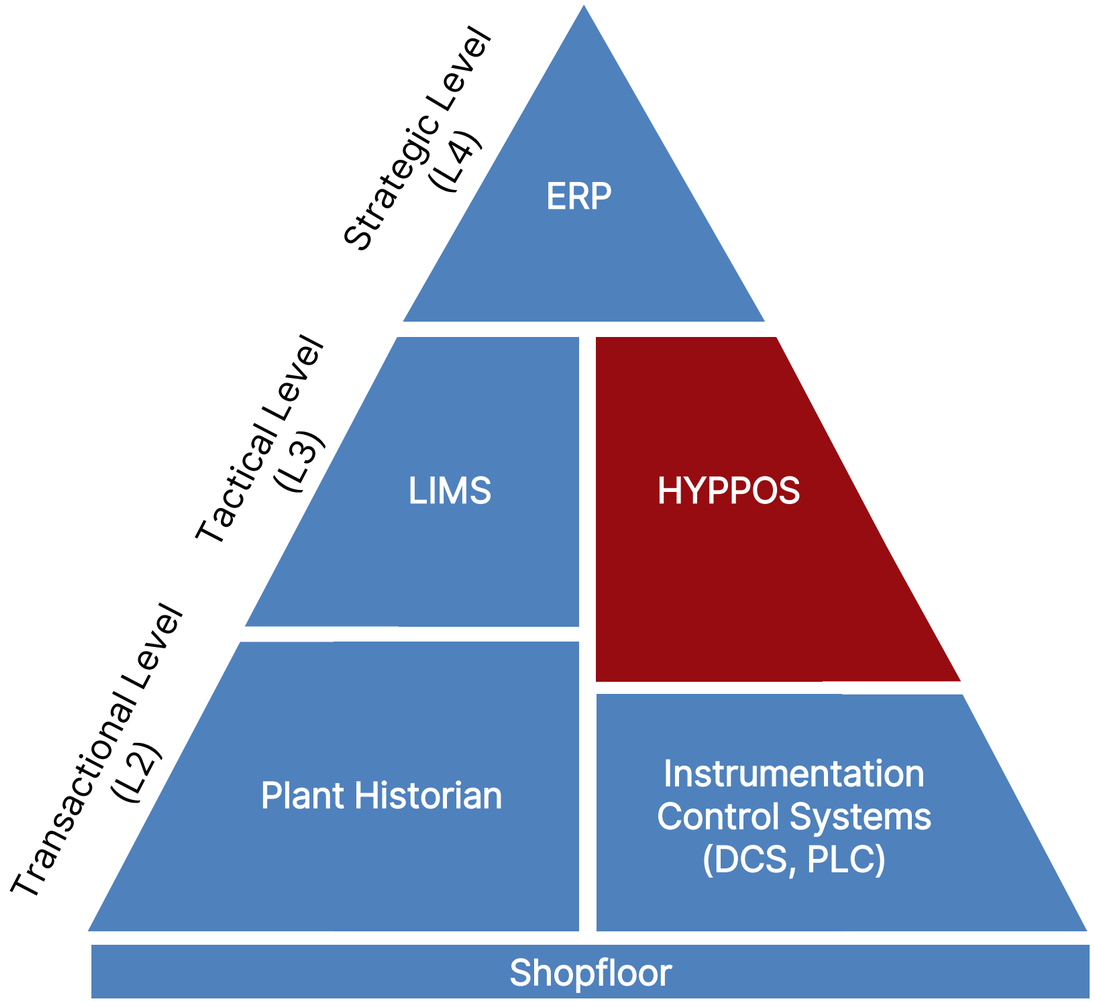
Efficient troubleshooting and performance overview through comprehensive traceability and reporting system (one data in one place)





In polypropylene (PP) production, MFR (Melt Flow Rate) and XS (Xylene Solubles) are two important parameters that help define the properties and quality of the produced polymer

HYPPOS: Place in Production Plant



Production Plant Systems:

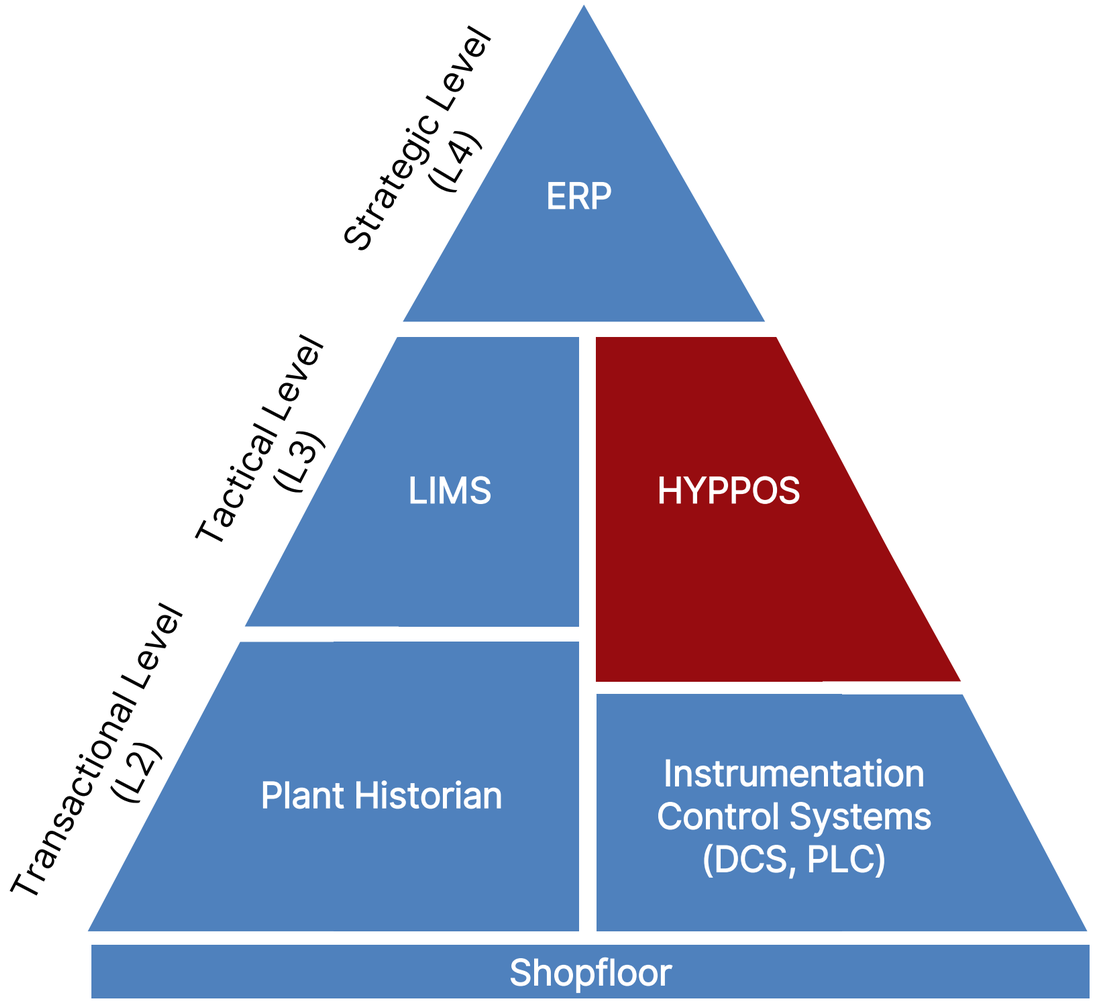
Strategic Level (L4)
ERP (Enterprise Resource Planning):
- **Role:** Integrates core business processes.
- **Function:** Manages finance, HR, procurement, production, supply chain.
- **Purpose:** Facilitates strategic planning and decision-making.

Tactical Level (L3)
LIMS (Laboratory Information Management System):
- **Role:** Manages laboratory operations and data.
- **Function:** Sample management, test scheduling, data reporting.
- **Purpose:** Ensures product quality and regulatory compliance.

Transaction Level (L2)
Plant Historian:
- **Role:** Collects and stores real-time process data.
- **Function:** Records temperature, pressure, flow rates, etc.
- **Purpose:** Used for analysis, troubleshooting, and process optimization.

Instrumentation Control Systems:
- **Role:** Manages and regulates manufacturing processes.
- **Function:** Real-time control and monitoring via PLCs, DCS, SCADA.
- **Purpose:** Ensures process stability, safety, and efficiency.

HYPPOS: Place in Production Plant



To accomplish its goals, HYPPOS integrates Production and Business Management Level IT Components of Production Plants:

- HYPPOS is positioned at the Tactical and Transactional Management Levels. The core of HYPPOS (Digital Twin of the process) is at Tactical Level and Software Sensors are at Transactional.
- HYPPOS collects data from systems at Transactional Level
- HYPPOS feeds and receives data from Strategic Level systems (e.g. SAP)
- HYPPOS co-exists and interacts with other systems at the Tactical Level (e.g. LIMS)

Currently supported communication protocols:

- OPC-DA
- Custom Web API
- Database-Driven Communication

HYPPOS and Microsoft Azure Cloud

HYPPOS is fully compatible with Microsoft Azure which brings a number of significant benefits for our users and production plants, ensures reliable performance, reducing operational disruptions and enhancing productivity

Scalability & Flexibility

Easily scale virtual machines up or down to match production needs without the need for significant upfront investment in hardware.

Reliability & Uptime

Azure’s robust infrastructure offers high availability and redundancy, ensuring continuous operation and minimal downtime.

Advanced Security

Leverage Azure's advanced security features, including encryption, firewalls, and compliance with industry standards to protect sensitive data.

Global Connectivity

Benefit from Azure's global network of data centers, ensuring low-latency access and reliable service across different geographical locations.

Easy Management

Azure provides powerful tools for managing virtual machines, making it easier to monitor performance, apply updates, and ensure optimal operation.

FINANCIAL BENEFITS POWERED BY HYPPOS

HYPPOS: Benefits use case (220kta PP plant in EU)

By leveraging HYPPOS, manufacturers can significantly enhance operational efficiency, ensuring substantial cost savings and increased revenue streams

Direct Benefits Range	Tonnes	€
Reduction of off-grade and increases of prime	880	€96,800
Reduction of Transition Loss	200	€46,000
Off-grade due to problems with MFR	220	€24,200
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Total	1,350	€172,500

HYPPOS: Benefits use case (220kta PP plant in EU)

Scenario A. Reduction of off-grade and increase of prime

- Capacity of a plant is **220ktpa**
- A total production of off-grade product at **4%** of annual production (220ktpa x 4% = 8,800t)
- HYPPOS helps to achieve **10%** reduction of off-grade and remaining in prime, i.e. **880t**
- The difference in gross margin is calculated as **110€/t**, that is 230€/t prime margin minus 120€/t off-grade product margin
- 880t at a gross margin difference of 110€/t amounts to a benefit of **€96,800** per annum

* We assume here the off-grade product still can be sold at a lower price

HYPPOS: Benefits use case (220kta PP plant in EU)

Scenario B. Reduction of Transition Loss

- Capacity of a plant is **220ktpa**
- HYPPOS helps to achieve 20% reduction of prime loss in transition
- The average annual loss is **1,000t.**
- 20% of 1,000t = 200t that at a gross margin of 230€/t amounts to a benefit of €46,000

HYPPOS: Benefits use case (220kta PP plant in EU)

Scenario C. Off-grade due to problems with MFR during normal operating conditions

- Capacity of a plant is **220ktpa**
- At least one batch per annum (220t) can be saved due to prediction of MFR by HYPPOS
- The difference in gross margin is calculated as **110€/t**, that is 230€/t prime margin minus 120€/t off-grade product margin
- 220t that at a gross margin difference of 110€/t amounts to a benefit of **€24,200** per annum

* We assume here the off-grade product still can be sold at a lower price

HYPPOS: Benefits use case (220kta PP plant in EU)

Scenario D. Reduction of loss due to shut-down and start-up

- Capacity of a plant is **220ktpa**
- 50t can be saved on shut-down and start-up due to prediction of MFR by HYPPOS
- The difference in gross margin is calculated as **110€/t**, that is 230€/t prime margin minus 120€/t transition product margin.
- 50t that at a gross margin difference of 110€/t amounts to a benefit of **€5,500**.

* We assume here the off-grade product still can be sold at a lower price

ADDITIONAL BENEFITS POWERED BY HYPPOS

Additional Benefits Powered by HYPPOS

Benefit	Description
Improved Inventory Management	Integration with ERP can help to optimize raw materials management. The precise quantities of consumed materials will be reported to ERP after each batch finalization. It will keep stock always up-to-date.
Traceability	Real-time material tracking and data collection enable efficient traceability of production process. At any time, production quality must be investigated, HYPPOS saves significant time and human resources on troubleshooting and investigation of a root-cause.
Digital Workflows	Configurable guidance and supervision for plant personal helps to avoid human mistakes and ensures all operations are done in a right moment, with correct parameters, and in expected sequence.
Reporting	Comprehensive scalable and configurable reporting system provides access to full production overview including Batch Summary Report, Detailed Batch Report, Additives Report, Detailed Production Report, KPI Report, and Scrap Batch Report.
Scalability	Flexible architecture of the platform allows extensions and add-ons. For example, there can be additional soft sensor implemented at the exit of the extruder to enhance significantly prediction of the quality.
Connectivity	Flexible architecture of the platform allows integration with different systems in a plant. We currently support communication over OPC and data bases, however this list can be extended to fulfill specific needs of specific customer.
Microsoft Azure Cloud Compatibility	This compatibility ensures enhanced scalability, robust security, and seamless interoperability. Additionally, leveraging Azure's global infrastructure supports reliable, low-latency communication across various locations, fostering greater collaboration and responsiveness in industrial operations.
Carbon Footprint	There are several factors where HYPPOS supports reduction of CO2 emissions and contribute into sustainable benefits – from potential taxation reduction to enhancement of market competitiveness and brand value.

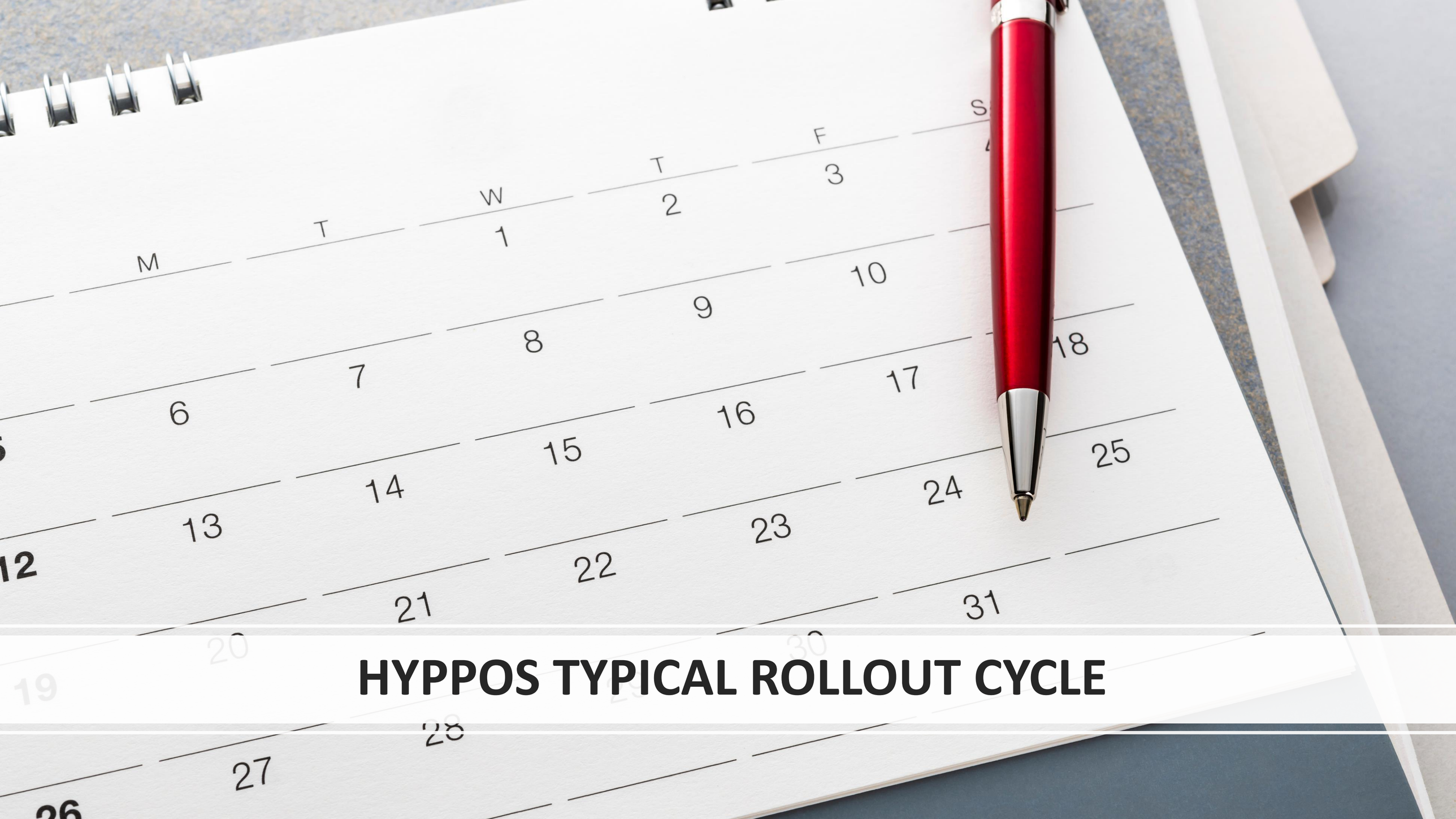
CARBON FOOTPRINT BENEFITS POWERED BY HYPPOS

Carbon Footprint Benefits Powered by HYPPOS

Benefit	Description
Tax savings	**Exceeding Allowances:** If the plant exceeds free allowances for CO2 and reduces emissions by recovering of 1,000 tonnes of material, it could save on avoiding extra taxation. **Allowance Price:** As of 2024, the price of EU ETS CO2 allowances is approximately €67 per tonne *(this price fluctuates, so need to check the latest rates).* **Tax Savings (ETS):** 1,000t * 2.725t * €67/t = €182,575 in potential savings annually from avoiding extra taxation *(2.725 tons of CO2 [average] generated out of 1 ton of PP annually).*
Revenue from Selling Surplus Allowances over EU Emissions Trading System (EU ETS)	Here is the additional potential revenue from selling surplus emission allowances. **Free Allowances:** If the plant operates within free allowances for CO2 and reduces emissions by 2,725 tonnes, it could have 2,725 tonnes of surplus allowances annually. **Allowance Price:** As of 2024, the price of EU ETS allowances is approximately €67 per tonne *(this price fluctuates, so need to check the latest rates).* **Selling Surplus:** 2,725t* €67/t = €182,575 in potential revenue annually from selling surplus allowances.

Carbon Footprint Benefits Powered by HYPPOS

Benefit	Description
Avoidance of Future Cost Increases	Early adoption can mitigate future cost increases due to stricter regulations. **Increasing LRF:** The Linear Reduction Factor (LRF) is set to increase, tightening the cap and likely increasing the price of allowances. **Future Price Projections:** If the allowance price rises to €100/t by 2026, the same 2,725-tonne reduction would save or generate €272,500 annually.
Access to Funding and Incentives	There are potential benefits from EU funding programs. **Innovation Fund and Modernization Fund:** Grants can cover 60% of additional costs for acquisition of innovative low-carbon technologies.
Enhanced Market Competitiveness and Brand Value	According to marketing studies **Market Data:** 66% of consumers are willing to pay more for sustainable products. **Brand Value:** Companies with strong sustainability practices often see a brand value increase of up to 20%.



HYPPOS TYPICAL ROLLOUT CYCLE

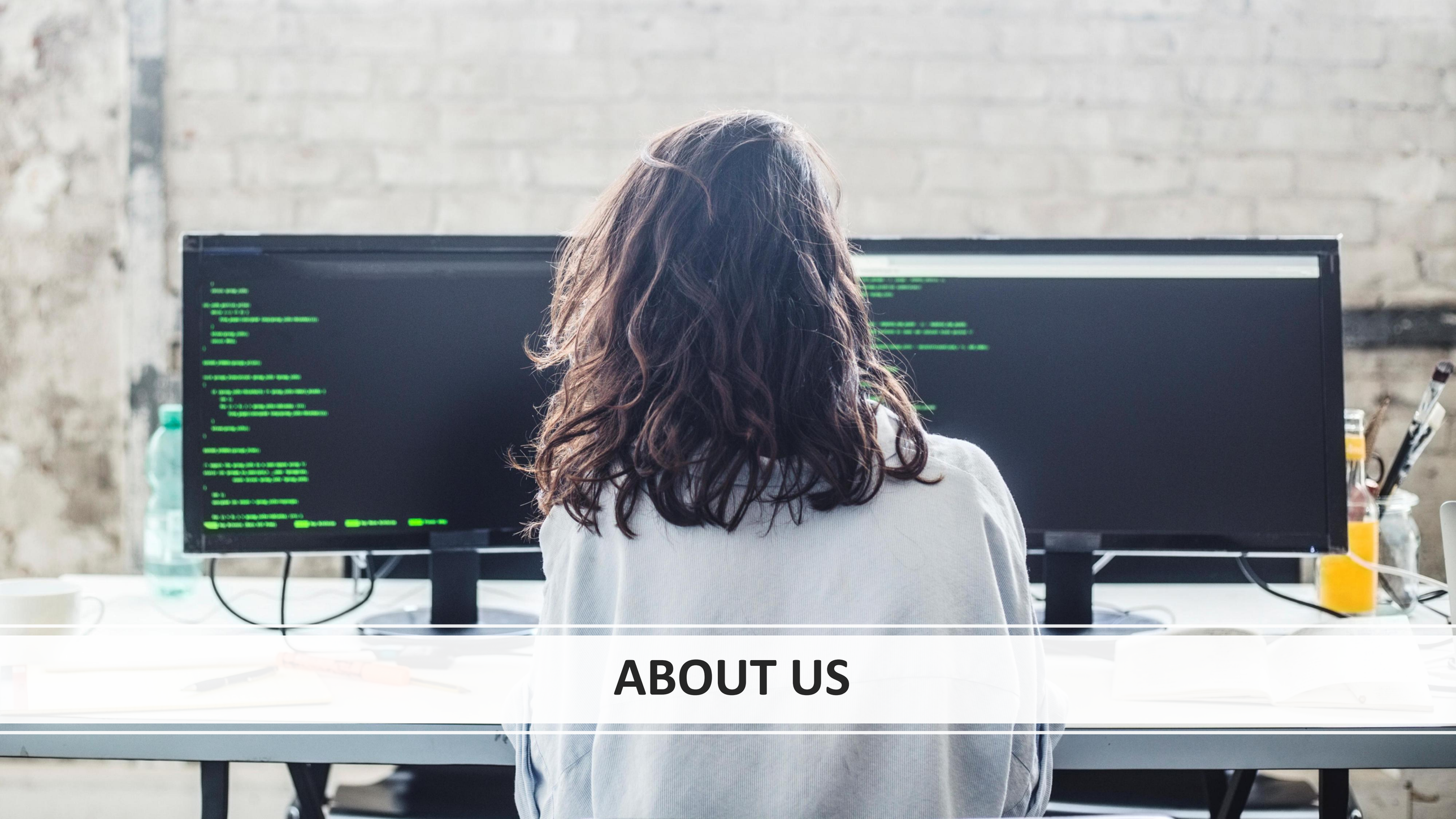
HYPPOS Typical Rollout Cycle

- P&ID’s
- Tag lists from DCS
- Displays from DCS
- SOPs
- QA Processes and interface to LIMS
- Network topology
- User Roles
- Data for Software Sensors training

- Analysis of plant information
- Site visit to complete data gathering and validation
- Create site configuration
- Site commissioning including installations and upload of site configuration

- Support personnel on-site to run HYPPOS
- Trainings for operators, engineers and managers
- Fill in product evaluation questionnaires
- Analyze user's feedback

* Timeline can be different in case of specific requests and complex plant configuration



ABOUT US

Who We Are

Our core team brings together over **135 years** of collective industry experience, supported by Hyperion's expertise in global operations in process manufacturing, software development, and business management

Hyperion Systems Engineering Group

Founder and Shareholder

Hyperion, a global technology and engineering group with over **30 years of industry experience**, has successfully delivered **more than 500 projects across 50+ countries**. Leveraging extensive expertise and established connections in the polymer sector, Hyperion has executed **18 bespoke implementations** similar to HYPPOS. The connection provides **preferential resources and personnel**, ensuring key roles are filled with seasoned professionals. Hyperion's strategic backing underscores HYPPOS's potential and value proposition.

HYPPOS: Journey

From bespoke solutions to a standardised, award-winning platform,
HYPPOS has evolved to drive efficiency and sustainability in manufacturing

- **2004**

Origin

Development of bespoke solutions for polymer plants by parent company

- **2004 - 2015**

Implementations

Series of bespoke implementations in polymer plants

- **2017**

Ideation

Conceptualization and standardization of HYPPOS as a platform

- **2018**

Productization

Launch of HYPPOS development

- **2020**

MVP

Deployment of HYPPOS Beta at a polymer plant

- **2021**

Software Sensors

Launch of Software Sensors concept development and implementation

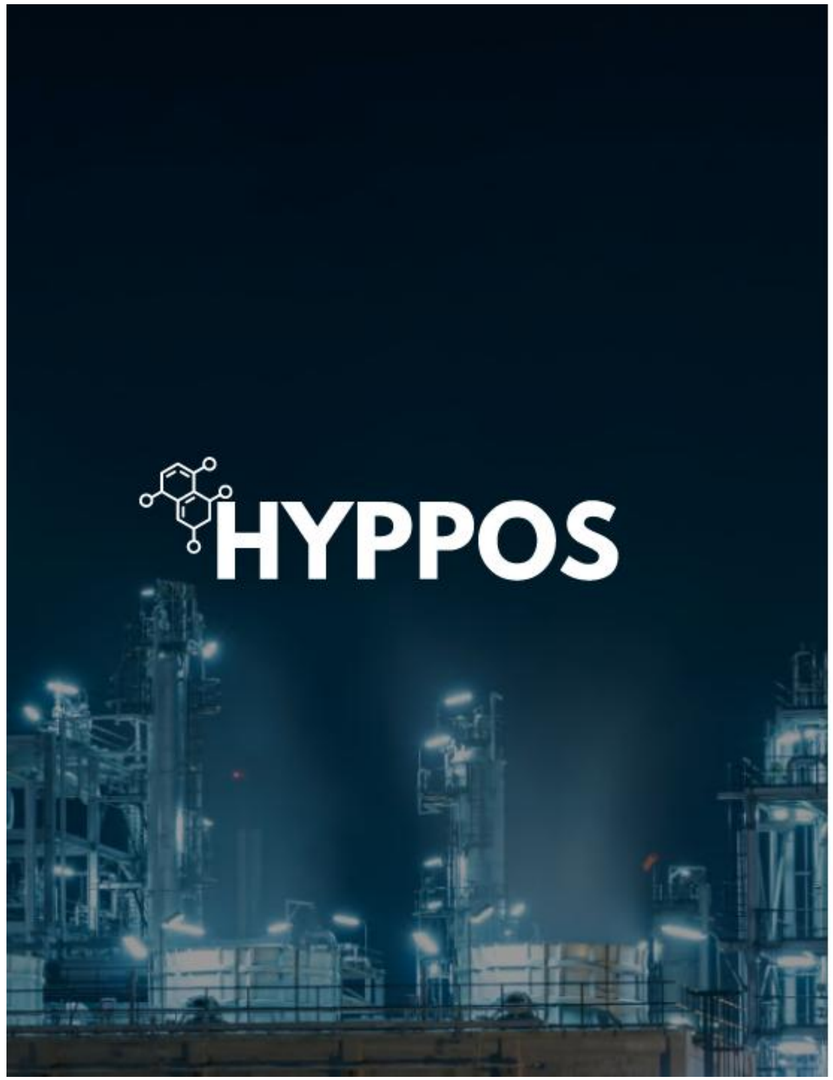
- **2024**

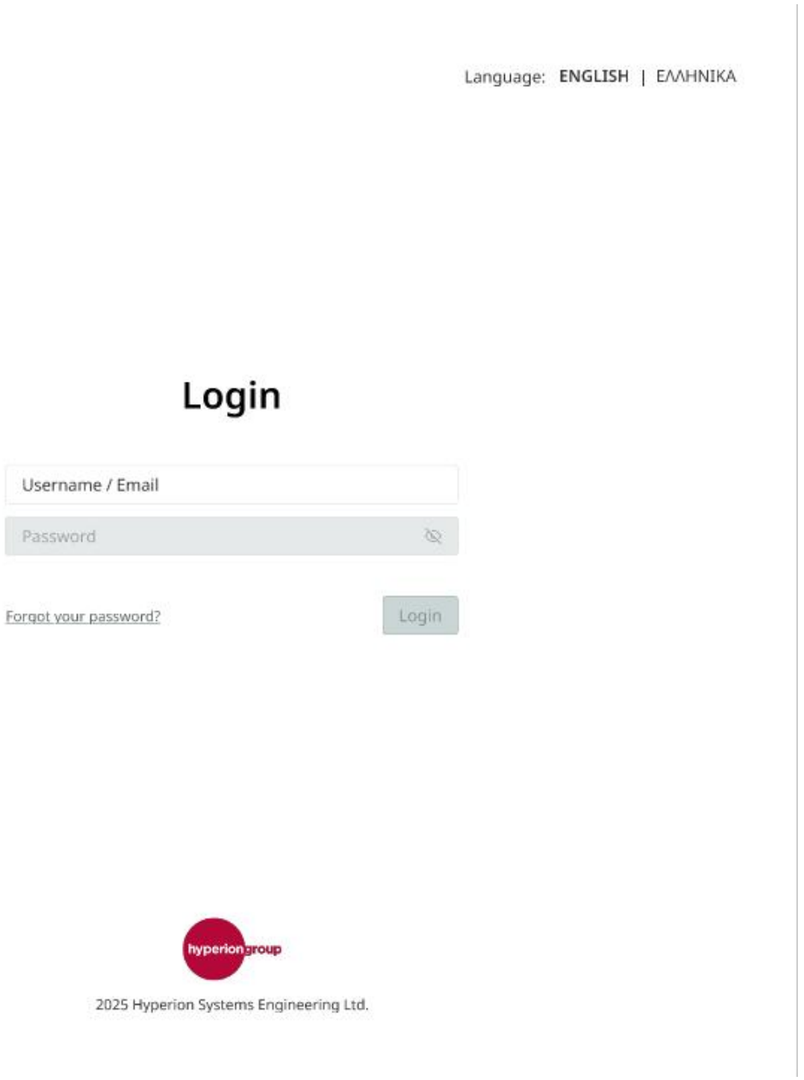
Paying Customer

Beta site customer signs agreement to become the first paying customer of HYPPOS

UI WALKTHROUGH

HYPPOS: UI walkthrough





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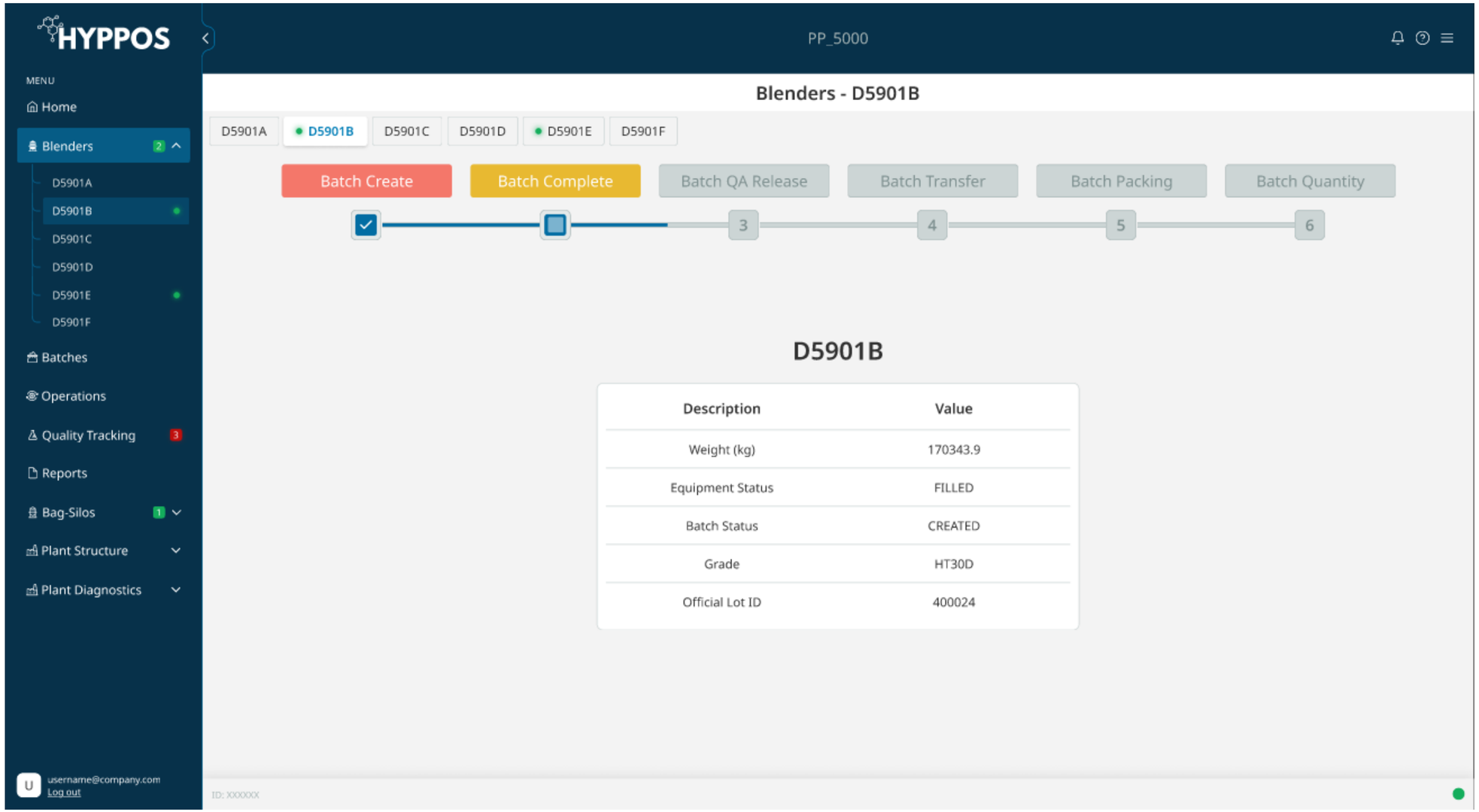

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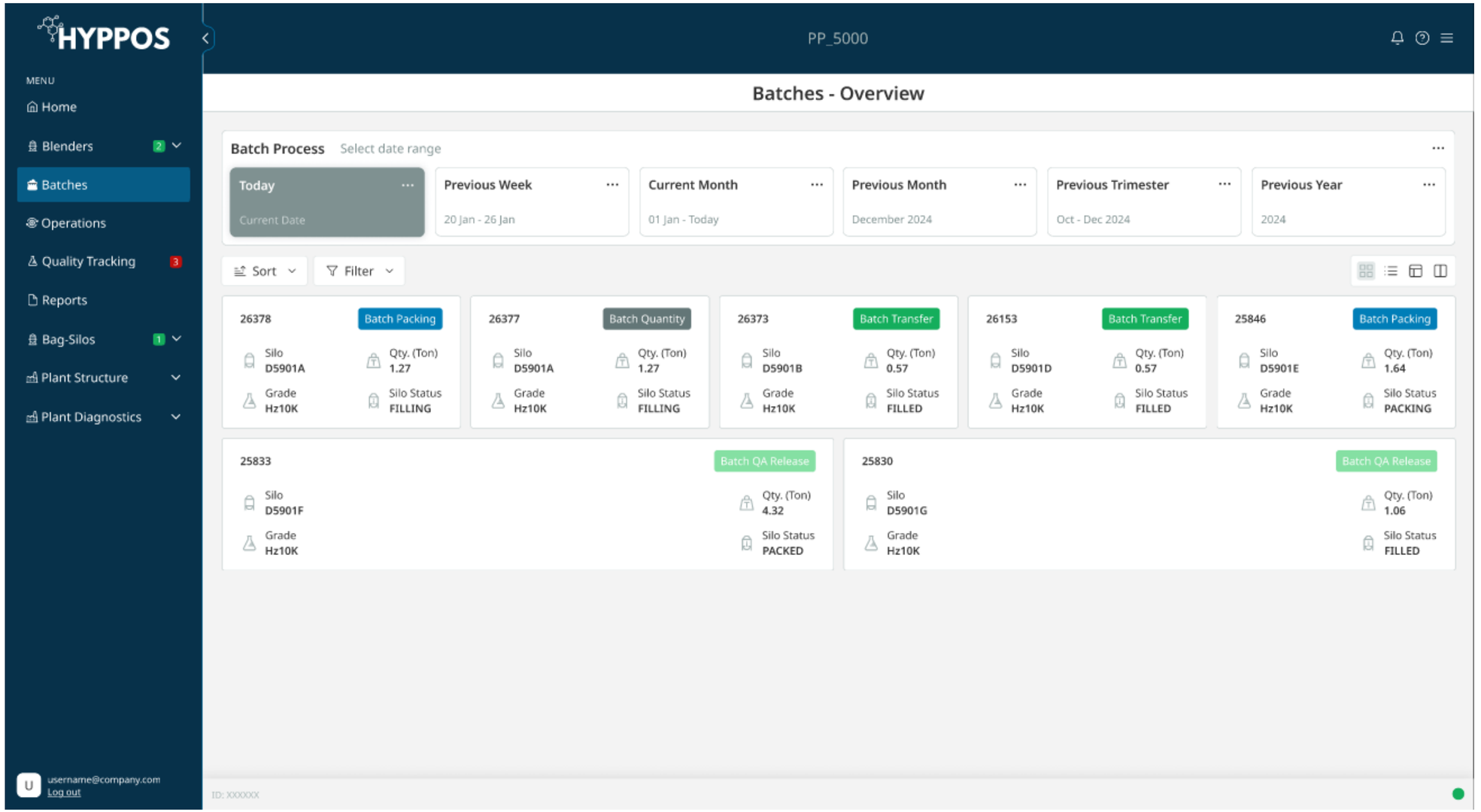

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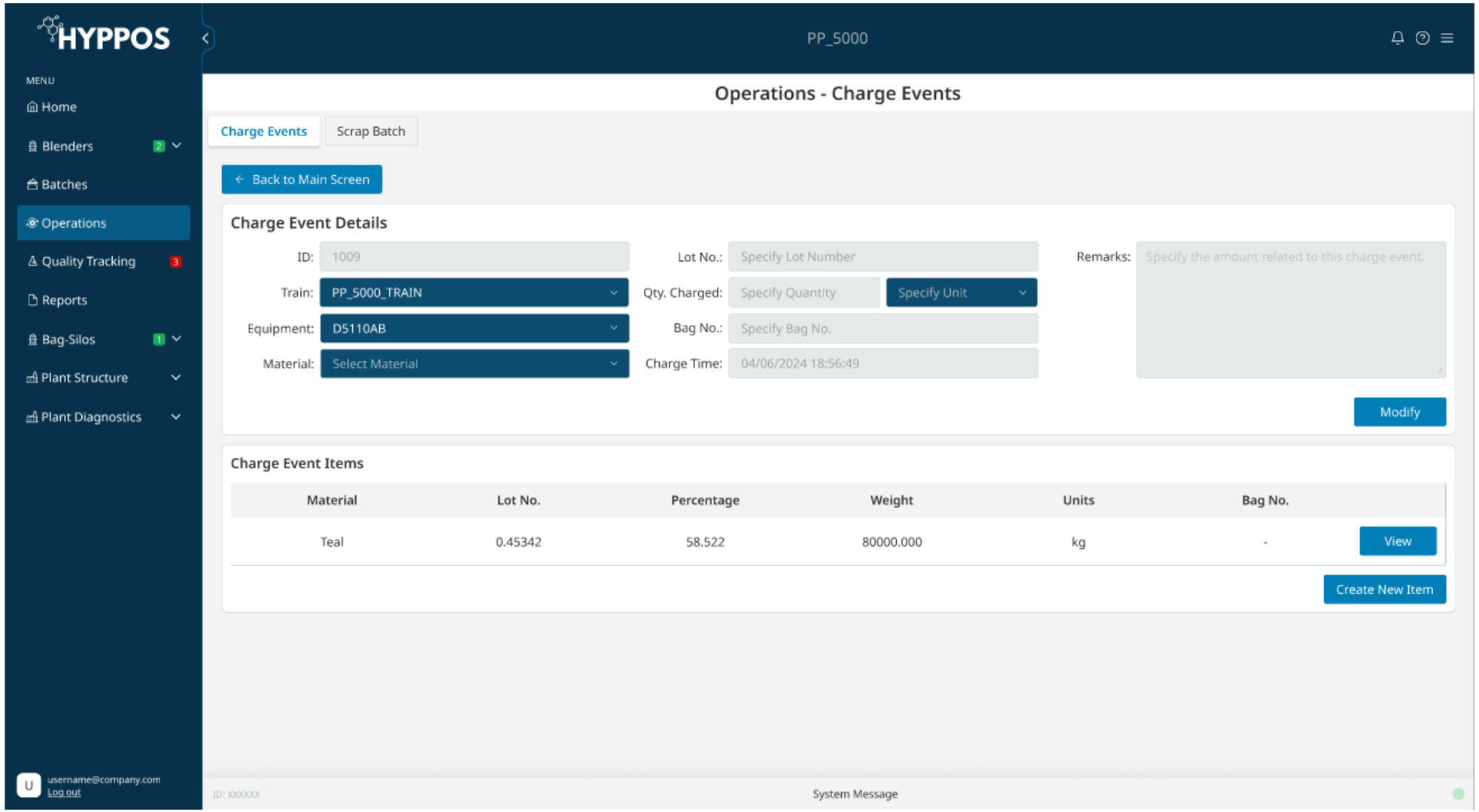

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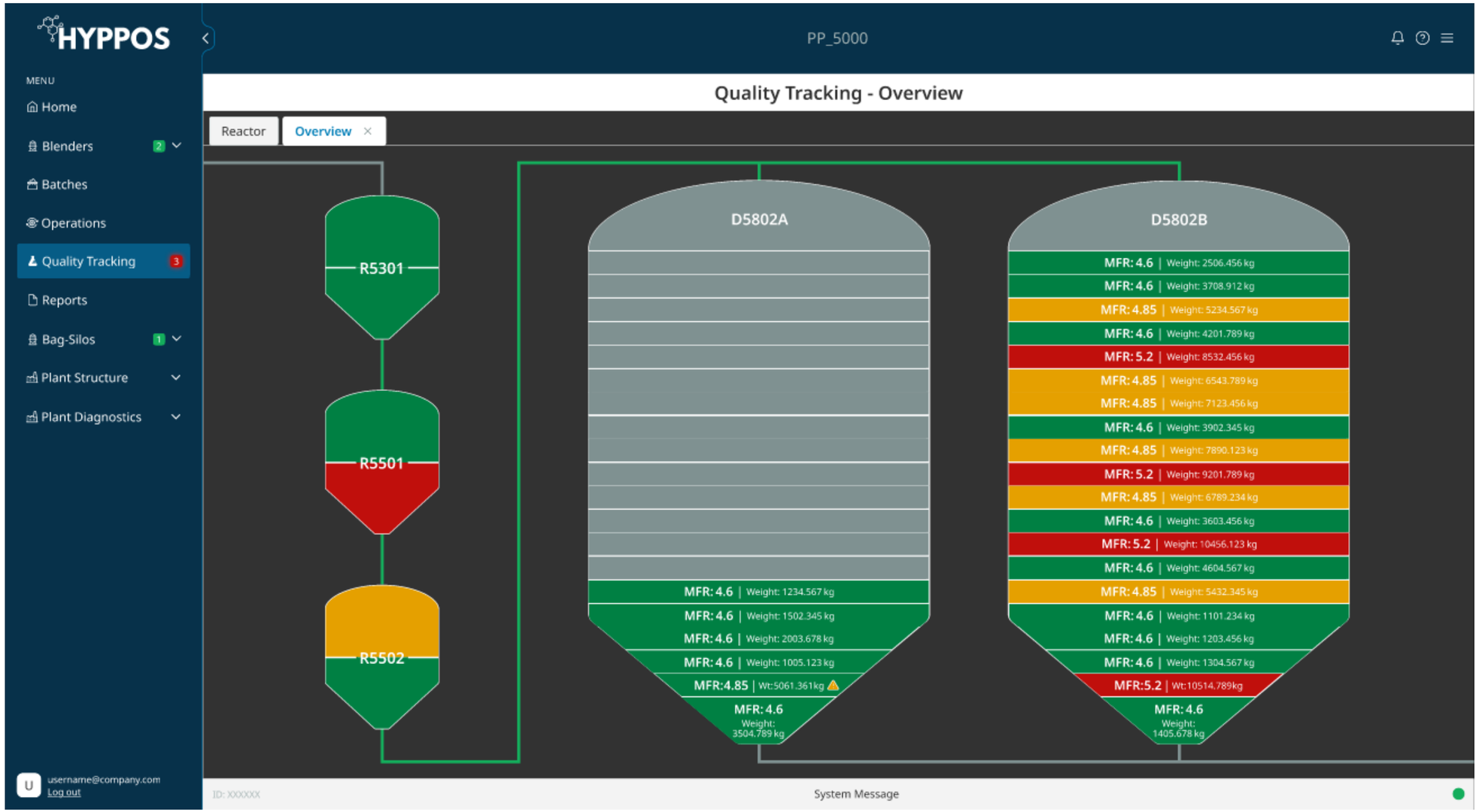

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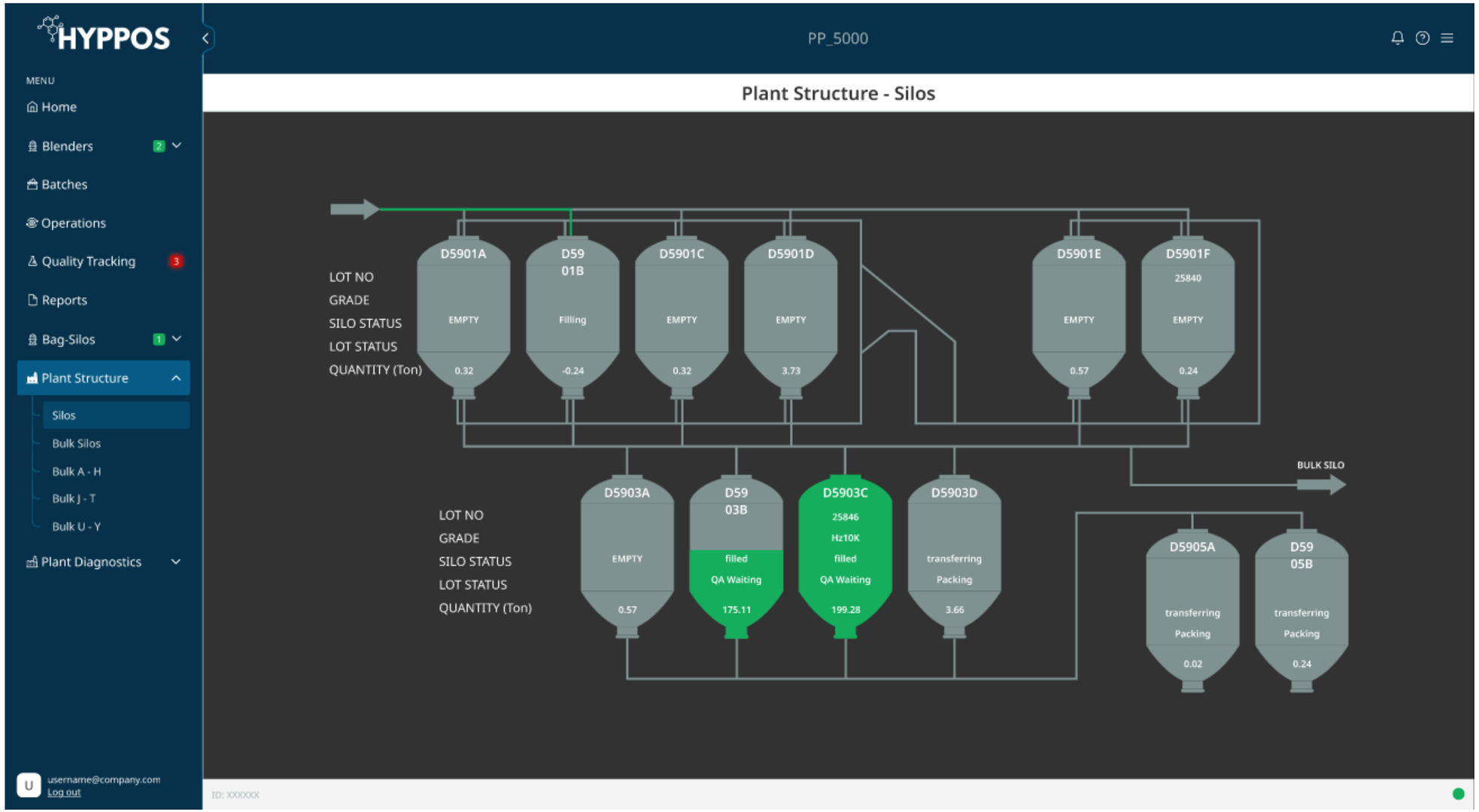

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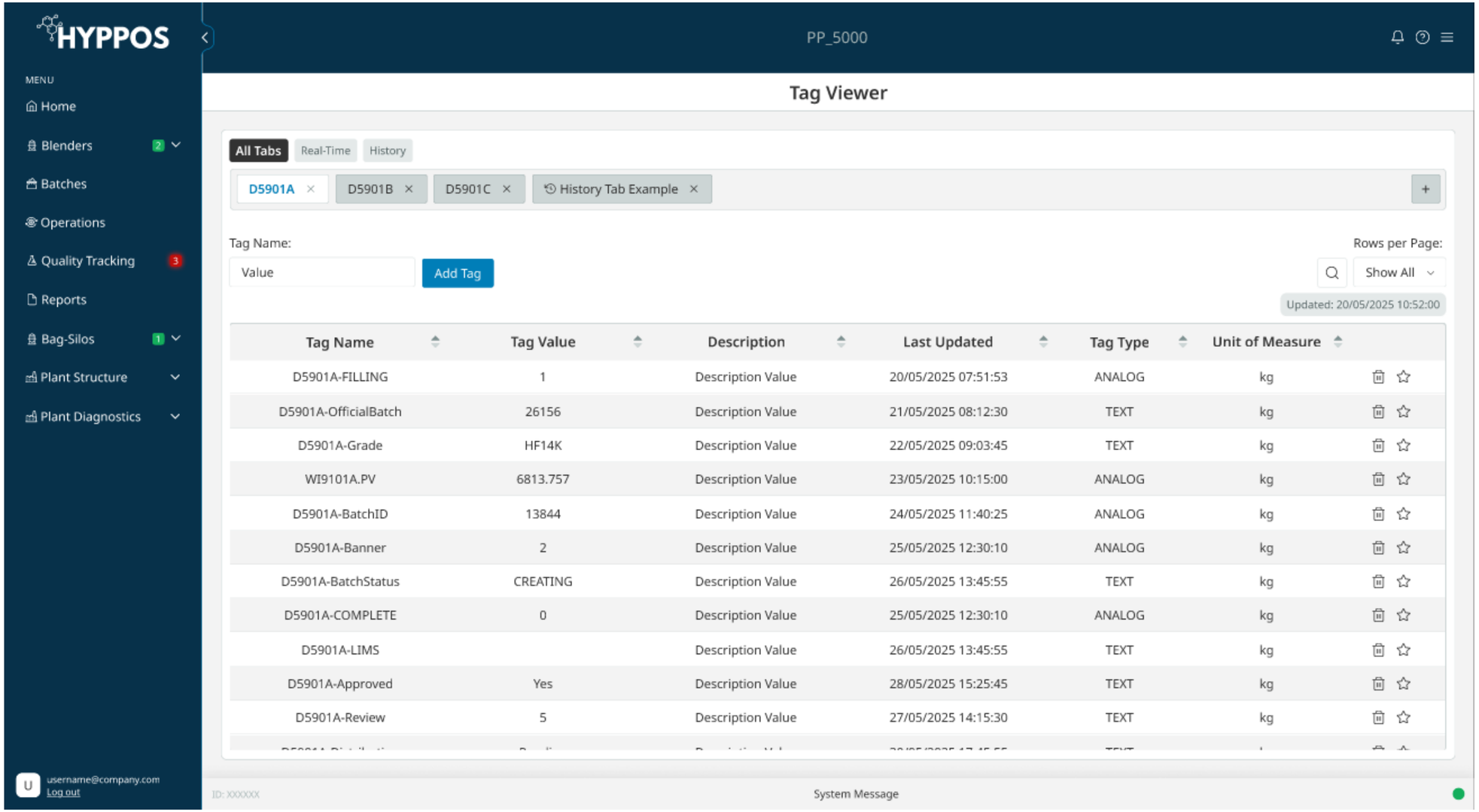

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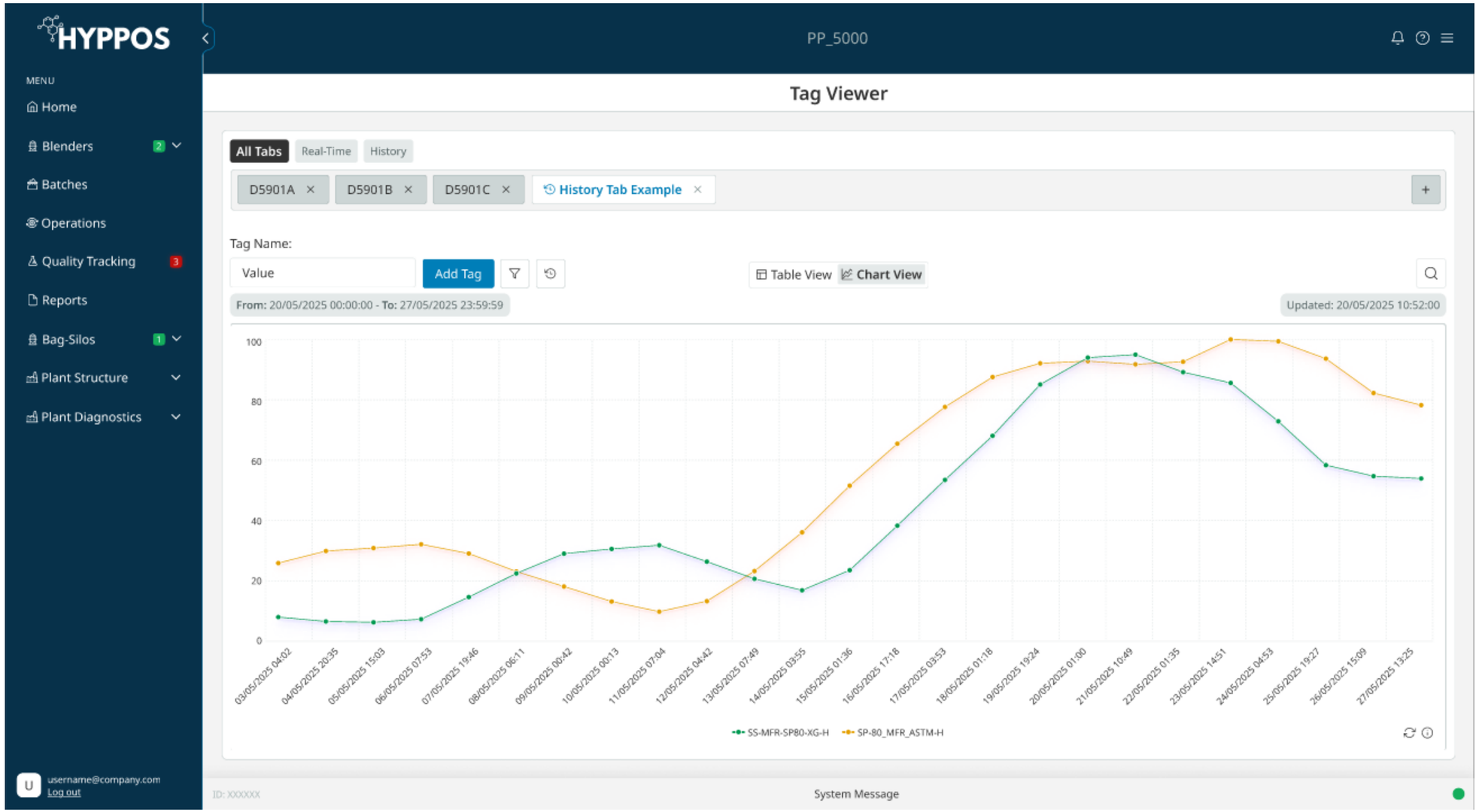

HYPPOS: Reports example

Detailed Lot Report

Lot summary

Lot No.	Intended Grade	Final Grade	Plant Silo	PH Silo	Lot Start	Lot End	Produced Qty (t)	Packed Qty (t)	Current Status
26720	HZ42Q	HZ42Q	D5901E	D5904Q			200.276	200.000	PACKED

Process times before lot creation

Equipment	Equipment Description	Start Time	End Time
EX5801	Polymer Additives Screw Feeder	8/2/2025 12:20:14 PM	8/2/2025 7:24:16 PM
QMX5802DLY	Additives Mixer	8/2/2025 12:20:14 PM	8/2/2025 7:24:16 PM
D5802B	Polymer buffer for Exruder	8/2/2025 11:32:13 AM	8/2/2025 6:31:15 PM
D5502	Dryer	8/2/2025 11:21:13 AM	8/2/2025 6:21:15 PM
D5501	Steamer	8/2/2025 11:11:13 AM	8/2/2025 6:11:15 PM
D5301	Flash Drum	8/2/2025 11:01:13 AM	8/2/2025 6:01:15 PM
R5202	Loop Reactor #2	8/2/2025 10:20:13 AM	8/2/2025 5:22:15 PM
R5201	Loop Reactor #1	8/2/2025 9:27:13 AM	8/2/2025 4:33:15 PM
R5200	Pre Poly Reactor	8/2/2025 9:15:13 AM	8/2/2025 4:23:15 PM
D5108B	Catalyst dosing drum	8/2/2025 5:57:11 AM	8/2/2025 5:59:11 AM

Lot timings after lot creation

Equipment	Equipment Description	Phase	Quantity (t)	Start Time	End Time
D5904Q	Bulk PH Silo Q	TRANSFER_TO_PH	200.276	8/3/2025 9:37:21 AM	8/3/2025 3:20:28 PM

HYPPOS: Reports example

Detailed Lot Report

Raw material consumption

Material Name	Material Code	BOM Quantity	Quantity	UoM
ZN180M	CATALYST		24.99	KG
DONOR_	DONOR_		2.07	KG
HYDROGEN	HYDROGEN		2.19	KG
HYDROGEN	HYDROGEN		4.54	KG
PROPYLENE	PROPYLENE		204,990.90	KG
TEAL_	TEAL_		37.96	KG
AO 168	Feeder D	212.29	212.38	KG
AO 3114	Feeder C	95.13	96.69	KG
CaSt	Feeder A	80.11	80.02	KG
Peroxide	PEROXIDE_	96.13	91.66	KG

HYPPOS: Reports example

Detailed Lot Report

Lot quality report

Date/Time	Sampling Point	Sampling No.	Test Name	Result	Min	Max	UoM
8/2/2025 12:00:00 PM	SP-80	2256351	Grade	HZ42Q			
			Melt Flow Rate 230 C / 2.16 kg	2.41			g/10 min
			Grade	HZ42Q			
			Melt Flow Rate 230 C / 2.16 kg	2.50			g/10 min
			Grade	HZ42Q			
			Melt Flow Rate 230 C / 2.16 kg	2.35			g/10 min
8/2/2025 12:30:00 PM	SP-81	2257613	Grade	HF14M			
			Melt Flow Rate 230 C / 2.16 kg	19.25			g/10 min
			W	20			%
			Angel Hair	0			
			Color Uniformity	0			
			Corpuscles	0			NR/ 7kg
			Dark Pellets	0			NR/ 7kg
			FE/ 0.7-1.5 mm	1			nr/m2
			FE/ 1.5 - 2.5 mm	0			nr/m2
			FE/ Film Rating Appearance	0			
			FE/>=0.2 mm	29			nr/m2
			FE/>=2.5 mm	0			nr/m2
			Foreign Bodies	0			
			Grade	HZ42Q			
			Irregular shape	0.00			

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For more information, contact:
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https://www.hyppos.net/