

Moneo Data Science Toolbox

Aplica Inteligencia Artificial
de un modo sencillo y económico



Moneo → Digitaliza de tu Empresa

ifm Group



Moneo → Digitaliza de tu Empresa

ifm Group

Process sensors



Condition monitoring systems



Industrial communication



Connection technology



Systems for mobile machines



Identification systems



Industrial imaging



Sensors for motion control



Position sensors



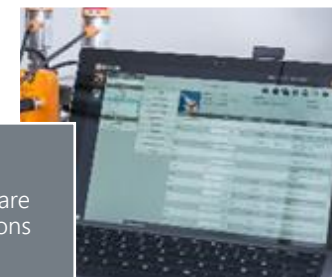
Safety technology



Edge Devices



Software solutions

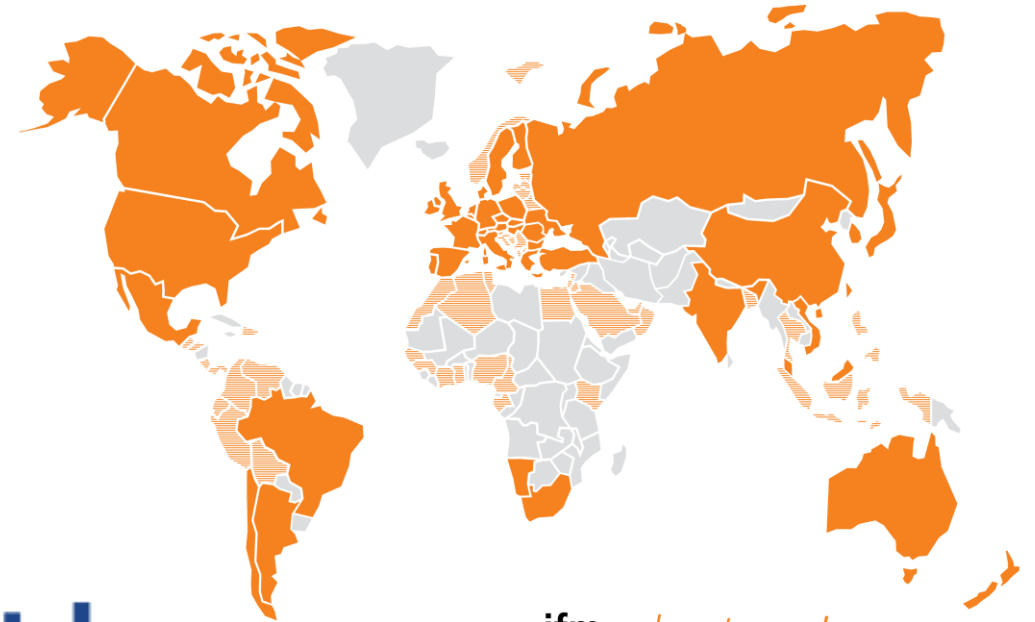


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ifm Group



ifm software
ifm solutions
ifm service

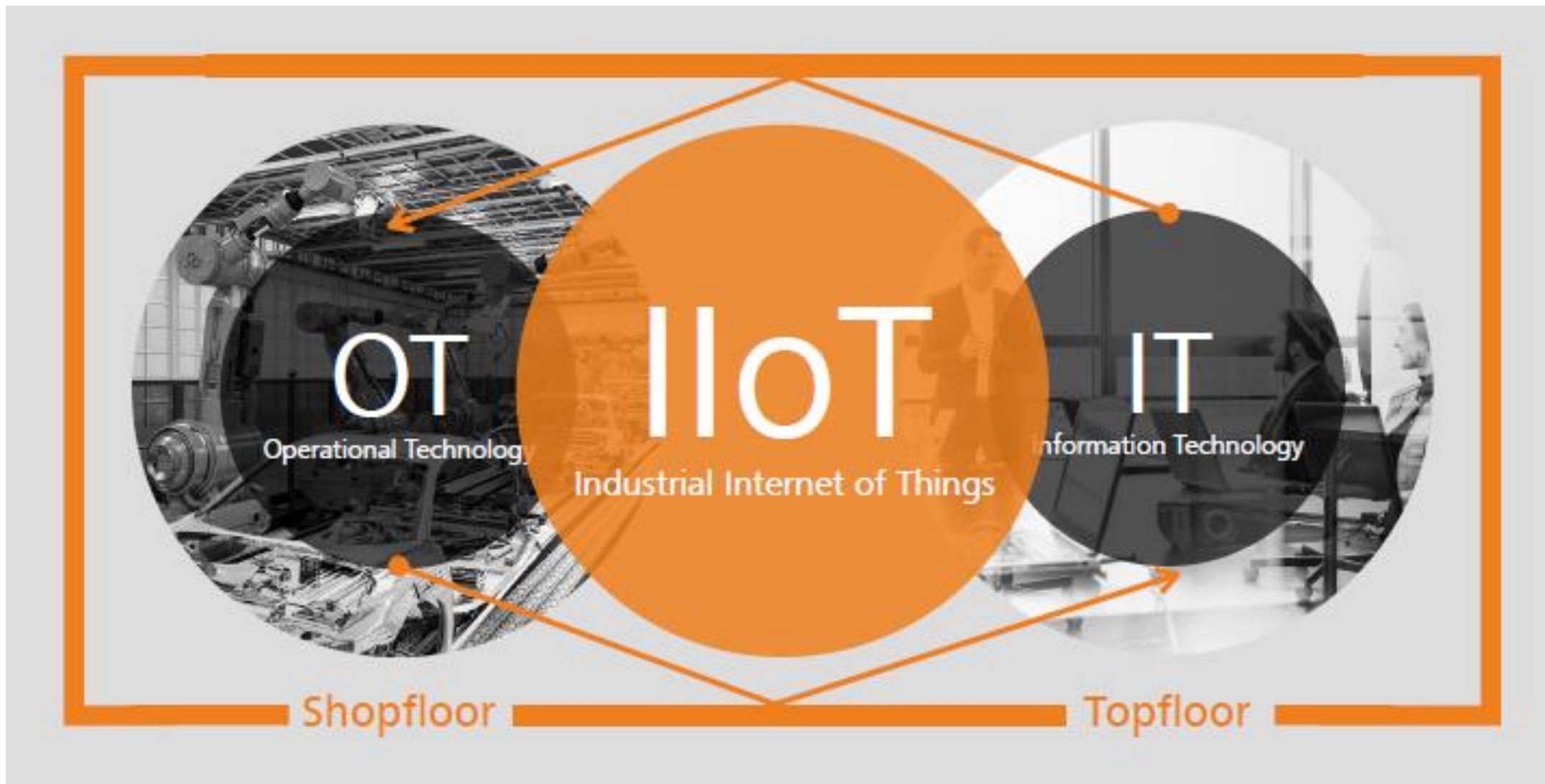


ifm – *close to you!*



Moneo → Digitaliza de tu Empresa

Tu Partner



Moneo → Digitaliza de tu Empresa

Moneo – Elimina Barreras

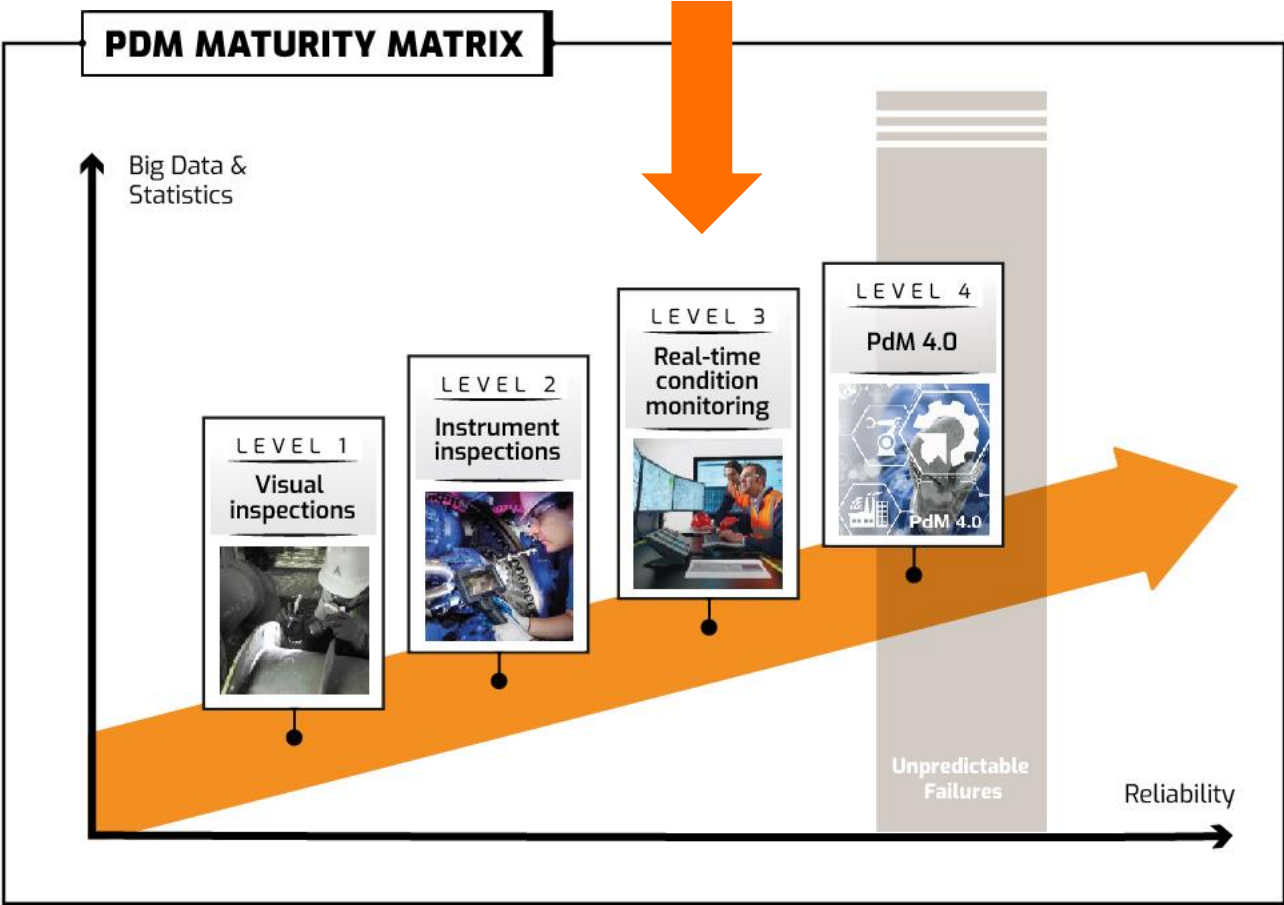


REAL TIME MOMINTORING CON MONEO

- **Reduce tiempo de implementación**
- **Reduce costes de proyectos**
- **Evita la necesidad de perfiles especializados**
 - **Conectividad para tod@s**
 - **Big Data para tod@s**
 - **Análisis avanzado para tod@s**
 - **Inteligencia Artificial para tod@s**

Moneo → Digitaliza de tu Empresa

PdM



Moneo → Digitaliza de tu Empresa

Moneo – Real Time Monitoring

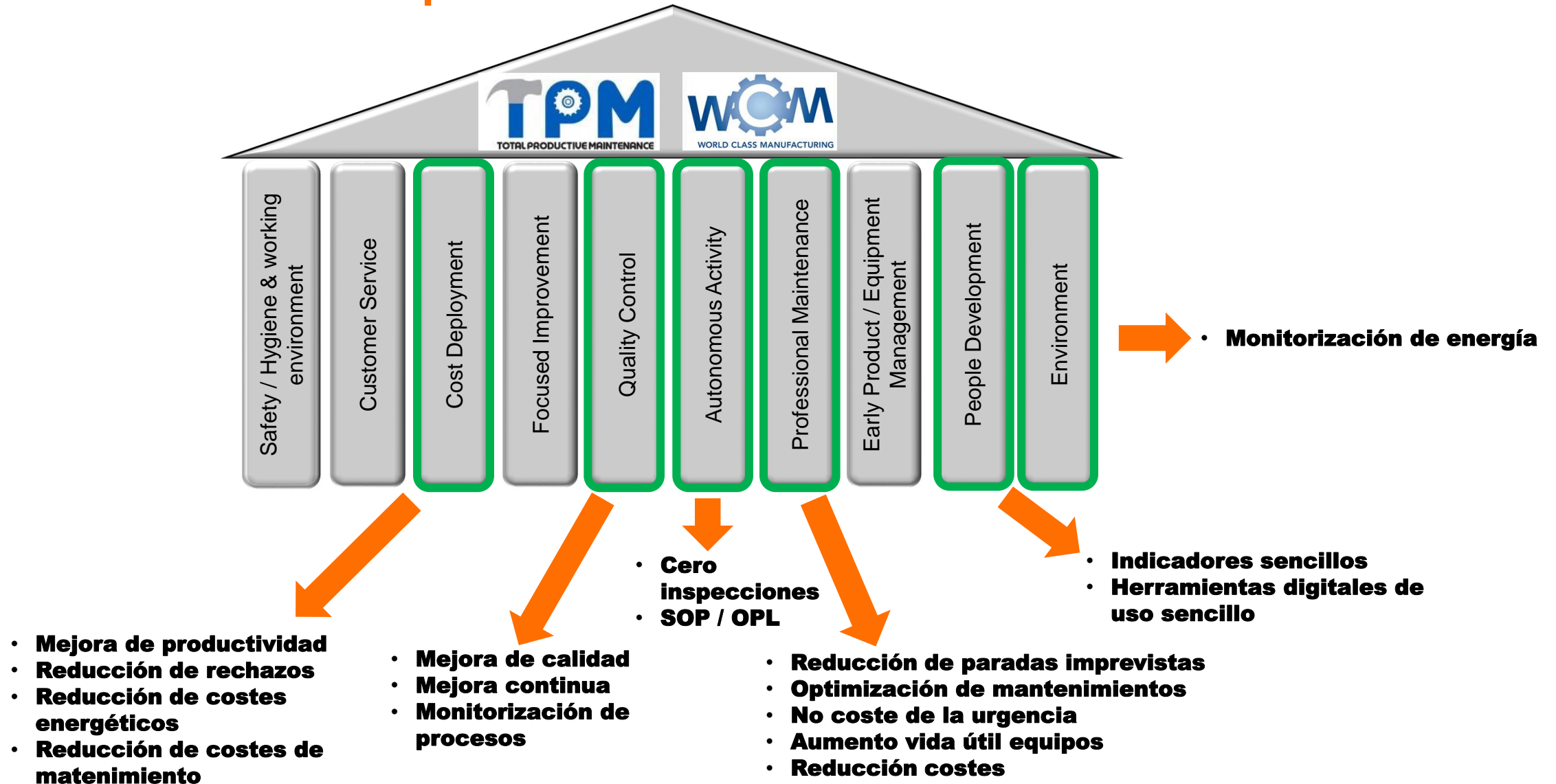


MONITORIZACIÓN EN TIEMPO REAL

- **Estado de Salud de Máquinas Productivas**
- **Estado de Salud de Equipos Auxiliares**
- **Consumos Energéticos**
- **Indicadores de Calidad**
- **Parámetros de Proceso**
- **Indicadores Productivos**

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Beneficios Departamentales



Moneo → Digitaliza de tu Empresa

Moneo – Real Time Monitoring



- **Uso sencillo sin necesidad de desarrollo de software**
- **Generación automática de BBDD**
- **Generación Drag & Drop de pantallas**
- **Generación Drag & Drop de herramientas de análisis avanzadas**
- **Data Flow Modeler para cálculo en tiempo real**
- **Conexión vía web browser**
- **Solución multi usuario**

Moneo → Digitaliza de tu Empresa

moneo

ifm moneo

1/10/2021 14:55:15 6 8 1

Abrir la administración de equipos

Tabla de monitorización Panel de control Análisis Tareas y tickets Ajustes y reglas

Grupo Virto / Funes / Sala / Compresor K4

K4 Links K4 Objects

COMPRESOR DE TORNILLO NH₃

The diagram shows a 3D model of a screw compressor system. It includes a large vertical cylindrical tank on the right, connected to a horizontal assembly of compressors and pipes. Several components are highlighted with colored boxes and labels:

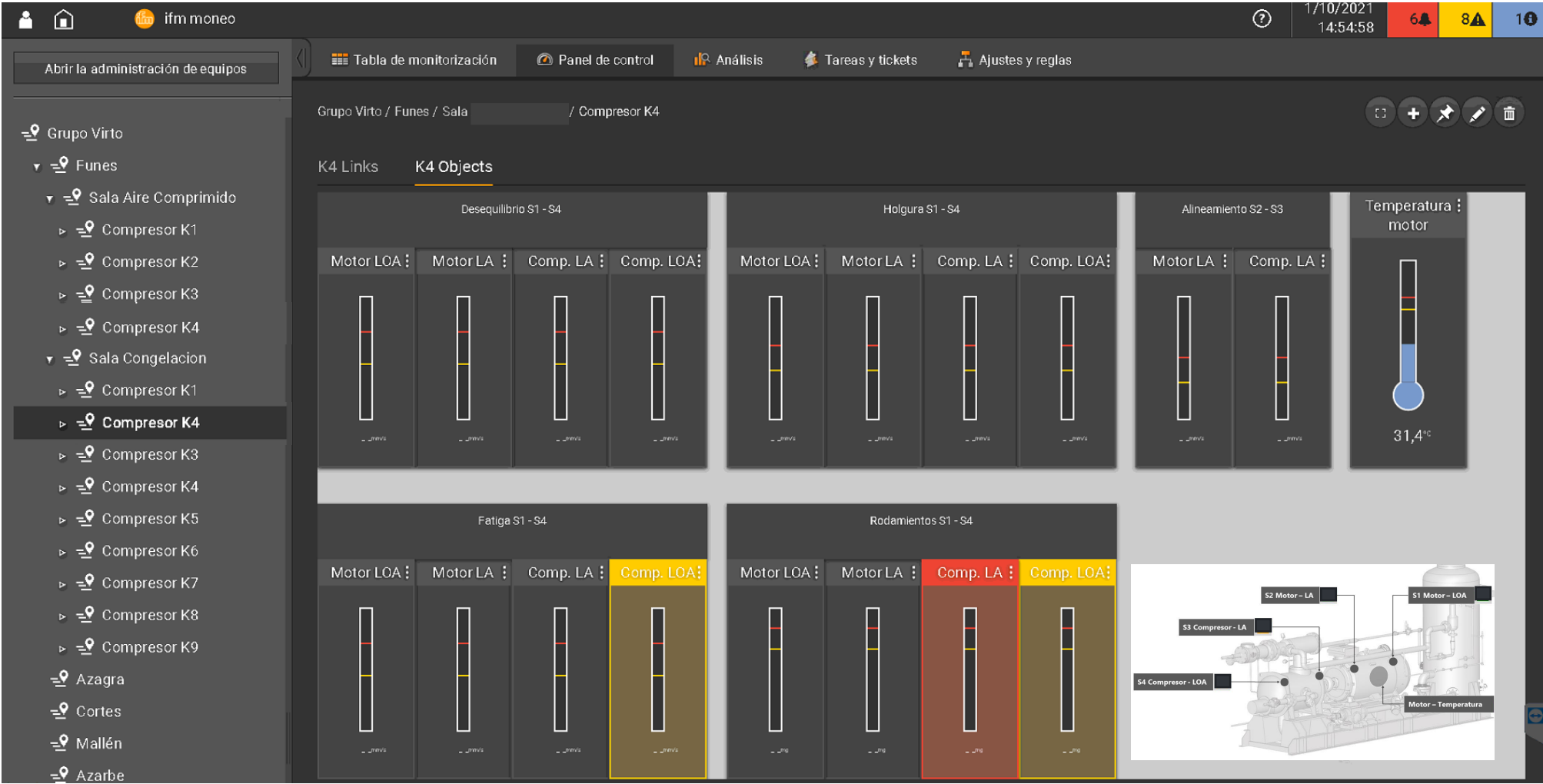
- S2 Motor - LA**: Green box, pointing to a motor on the left side of the horizontal assembly.
- S1 Motor - LOA**: Green box, pointing to a motor on the right side of the horizontal assembly.
- S3 Compresor - LA**: Orange box, pointing to a compressor unit in the middle of the horizontal assembly.
- S4 Compresor - LOA**: Orange box, pointing to a compressor unit on the far left of the horizontal assembly.
- Motor - Temperatura**: Green box, pointing to a motor at the bottom right of the system.

Left sidebar menu:

- Grupo Virto
 - Funes
 - Sala Aire Comprimido
 - Compresor K1
 - Compresor K2
 - Compresor K3
 - Compresor K4**
 - Sala Congelacion
 - Compresor K1
 - Compresor K2
 - Compresor K3
 - Compresor K4
 - Compresor K5
 - Compresor K6
 - Compresor K7
 - Compresor K8
 - Compresor K9
 - Azagra
 - Cortes
 - Mallén
 - Azarbe

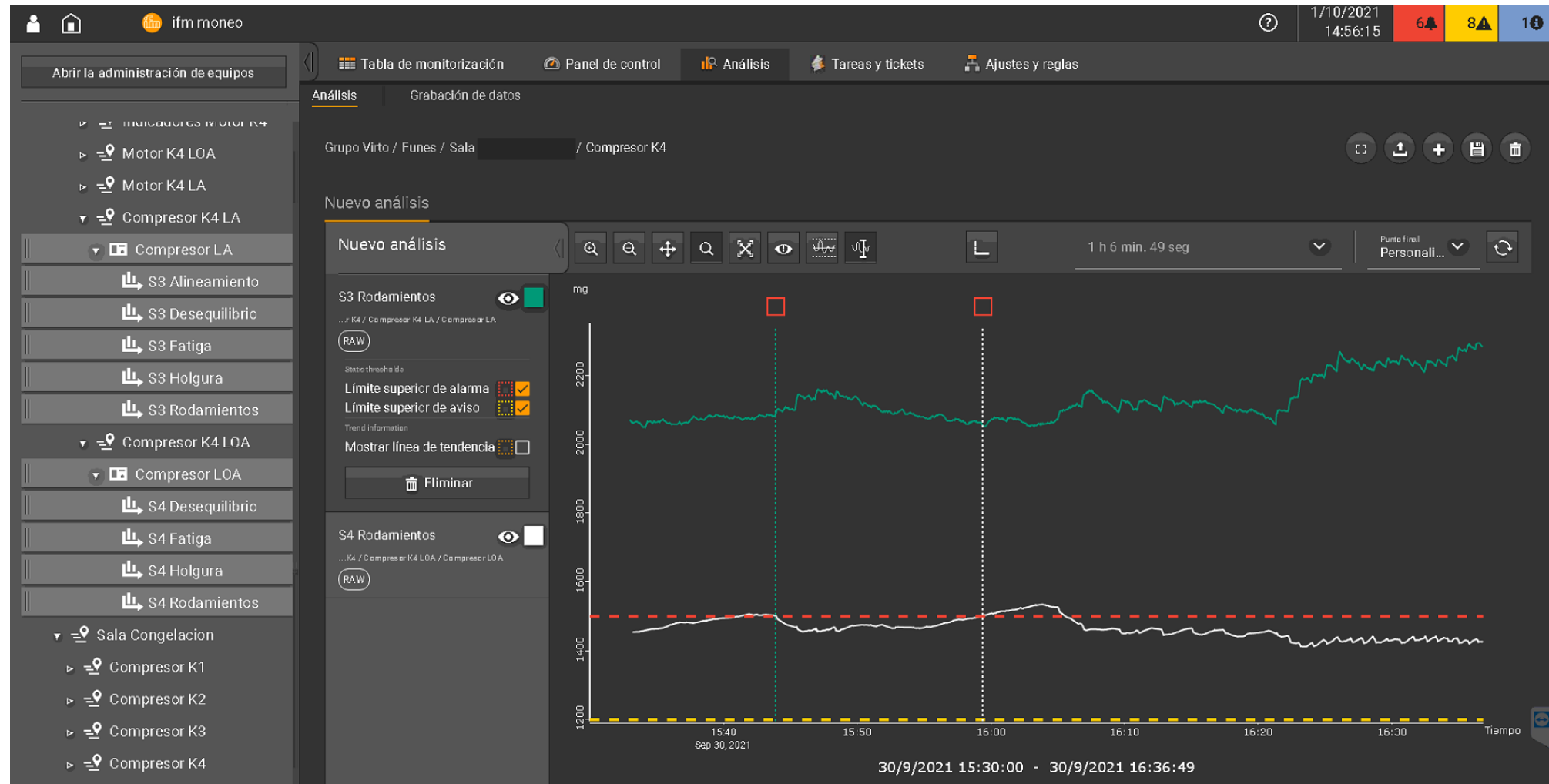
Moneo → Digitaliza de tu Empresa

moneo



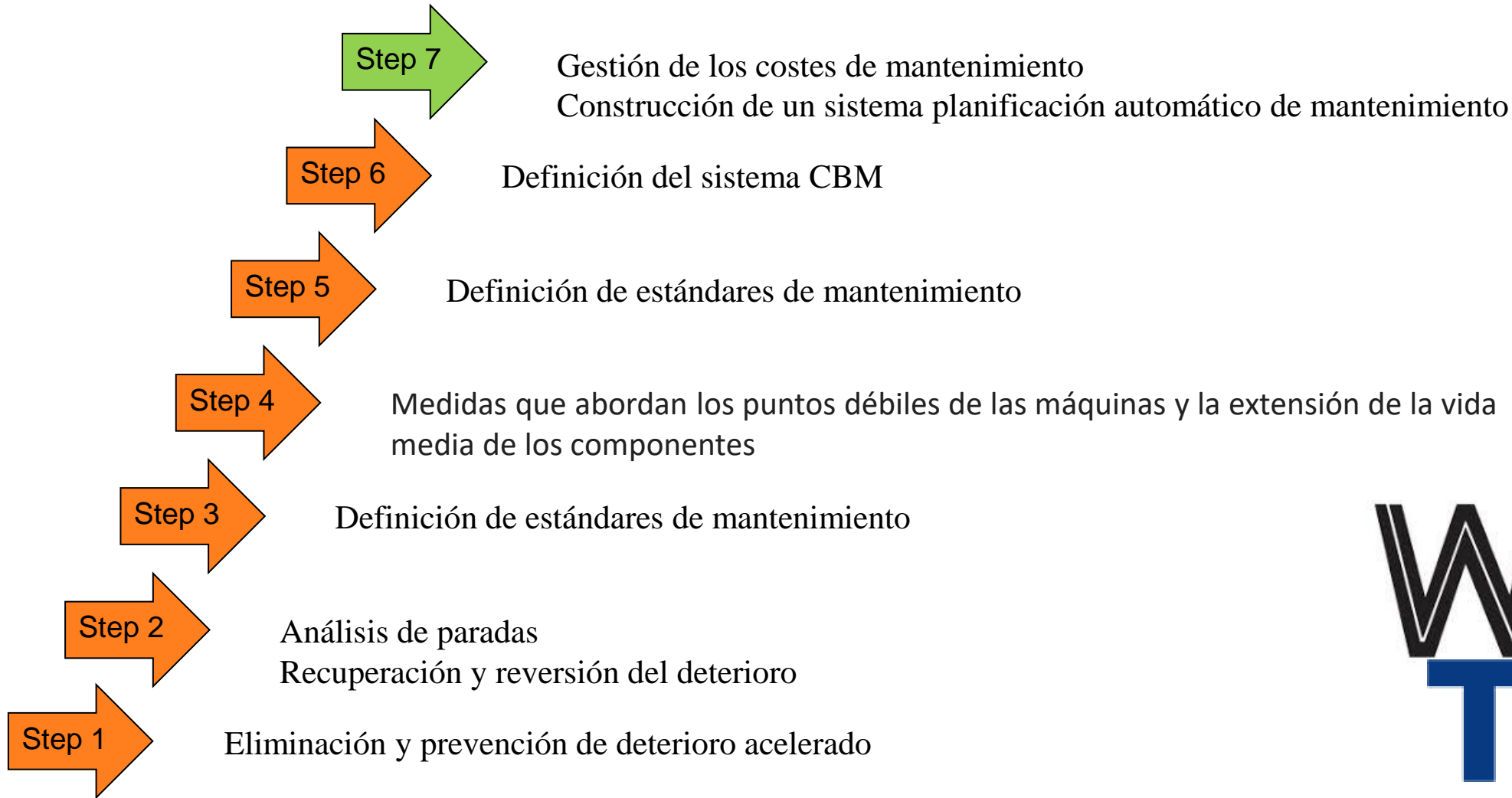
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moneo



Moneo → Digitaliza de tu Empresa

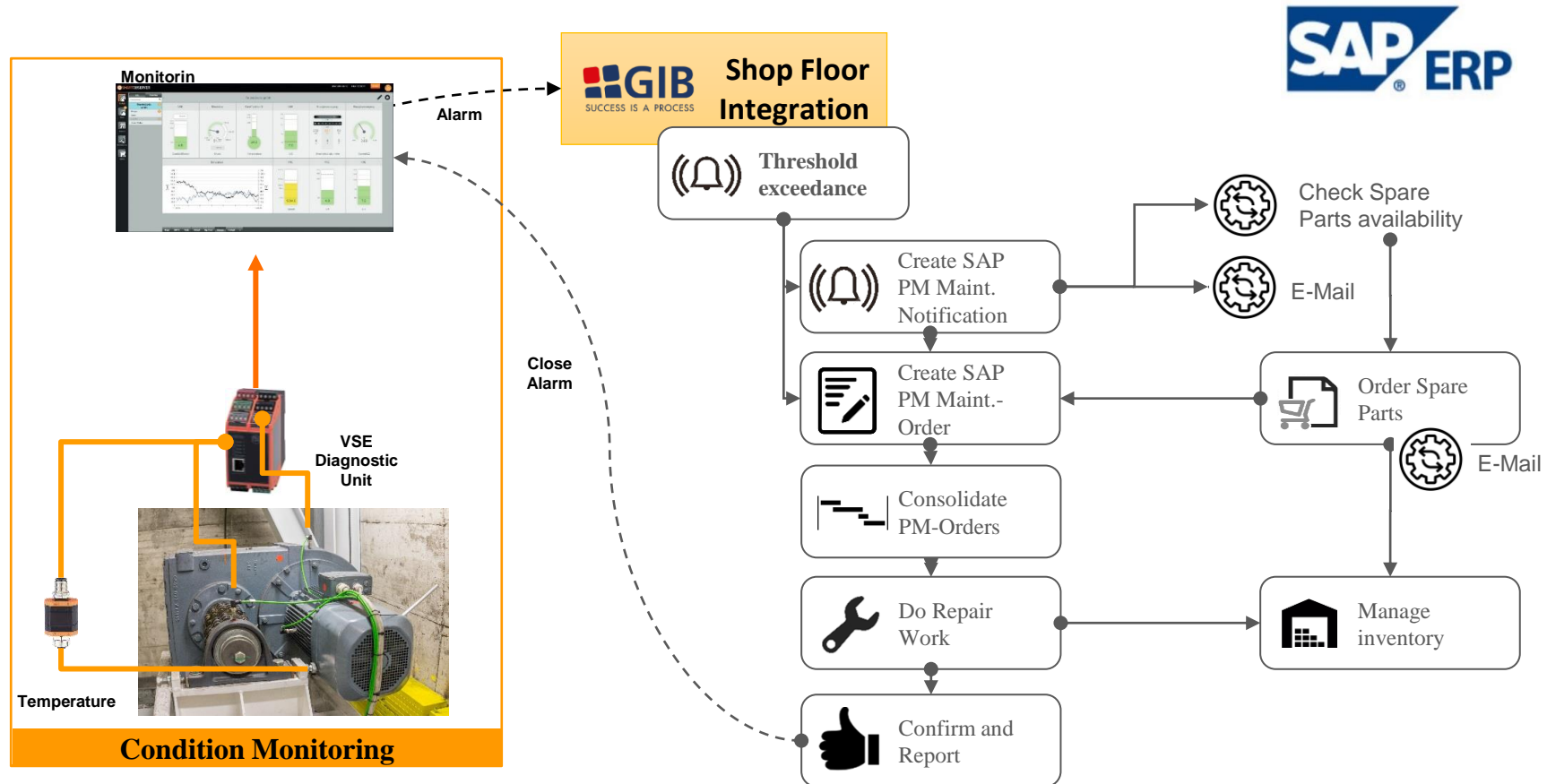
Digitalización del Mantenimiento



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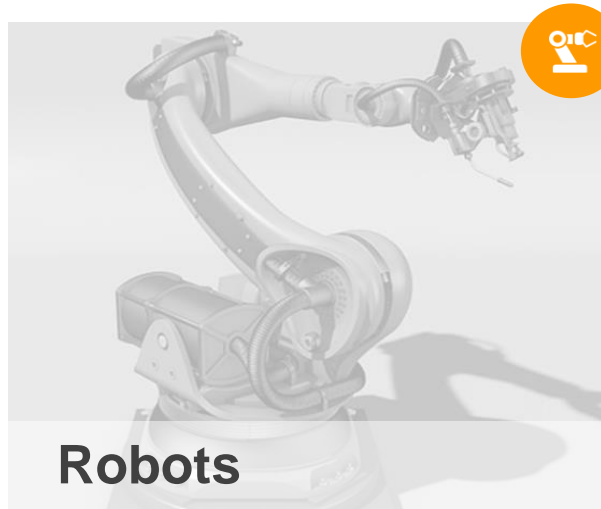
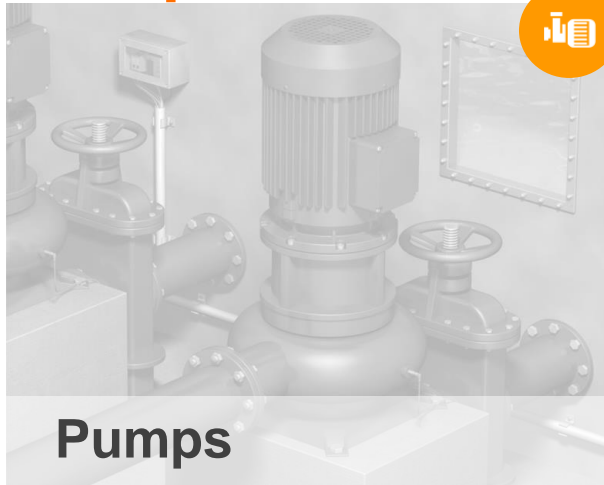
Digitalización del Mantenimiento

Shop Floor Integration to SAP (Plant Maintenance)



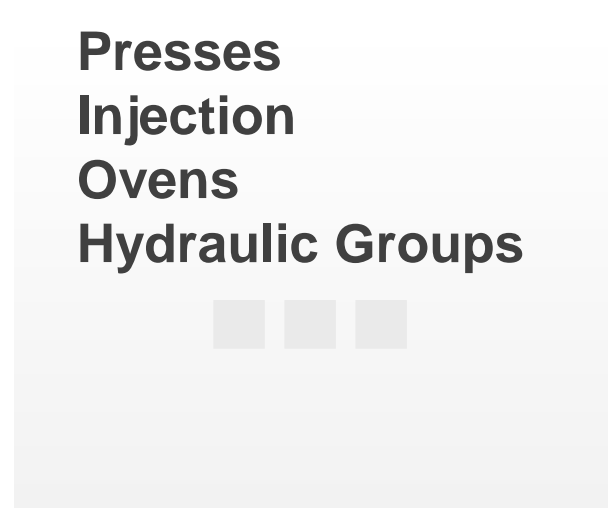
Moneo → Digitaliza de tu Empresa

Aplicaciones



Moneo → Digitaliza de tu Empresa

Aplicaciones



Moneo → Digitaliza de tu Empresa

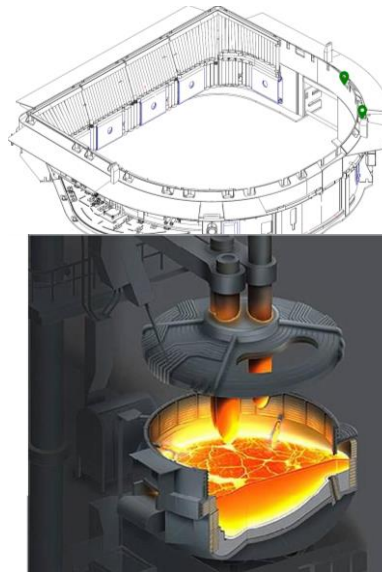
Consumo Aire
Comprimido



Soplantes



Horno Arco Eléctrico



Filtración



Torres de Refrigeración



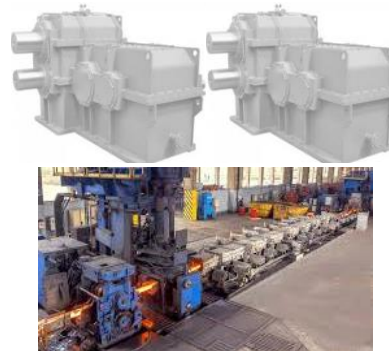
Consumo Agua



Depósitos



Tren de Laminado
Y
Cajas de Acabado



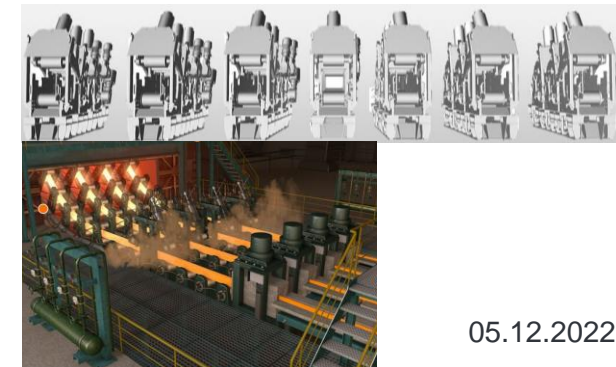
Consumo Corriente
Eléctrica



Mezclador



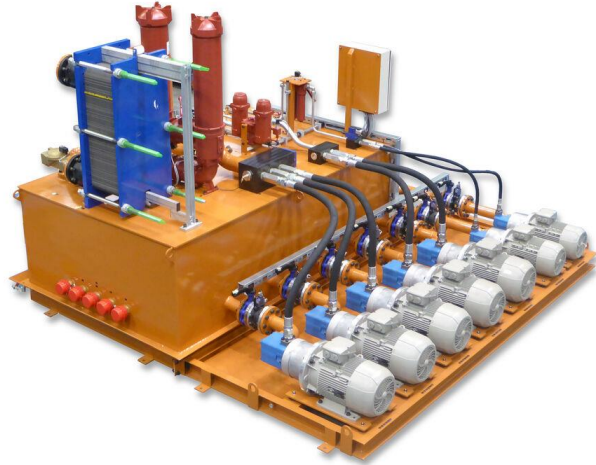
Colada Continua



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Casos de éxito

Grupos Hidráulicos



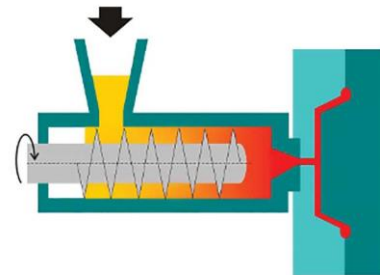
Máquina Papel



Prensas - Smart Stamp



Inyección de Plástico



Pintura y Cataforesis



Lubricación

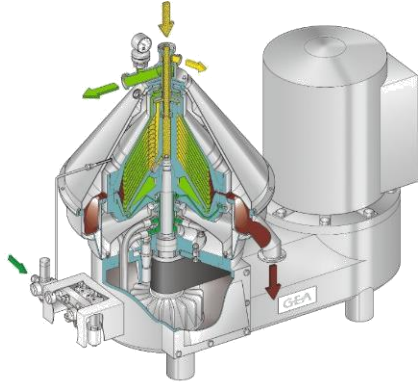


Estampación en Caliente

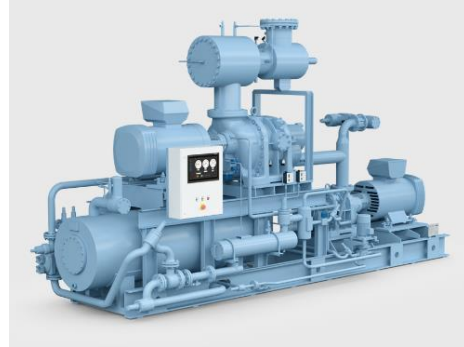


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Separador



Compresor frío



Desnatadora leche
Clarificador



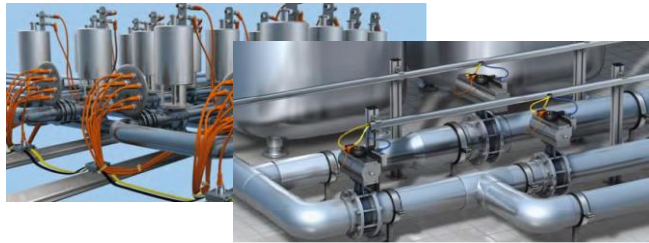
Pasteurizador
Intercambiador calor



Chiller
Ventilador refrigeración



Valvulas



Dosificador



Agua refrigeración



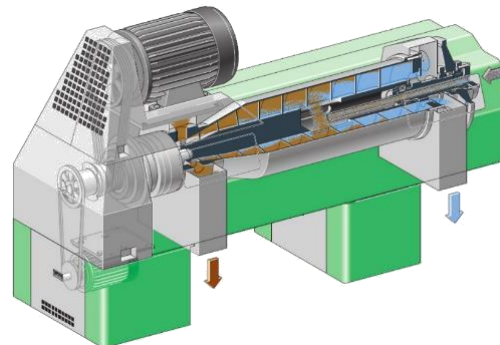
Bombas



Homogeneizador



Decantador



Mezcladores

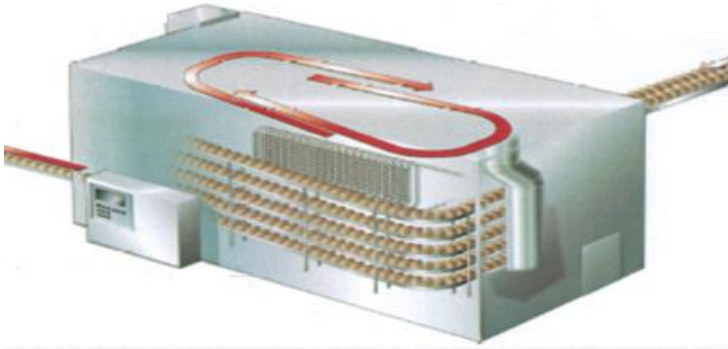


Conveyors



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Enfriador



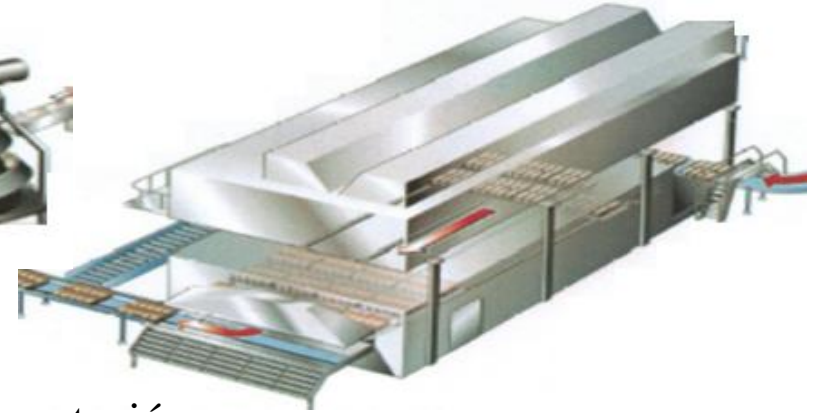
Bombas de Vacío



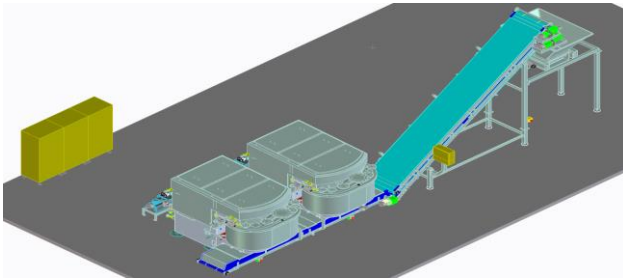
Moldeador



Hornos



Amasadoras



Conveyors



Fermentación



Consumo Agua



Consumo Aire

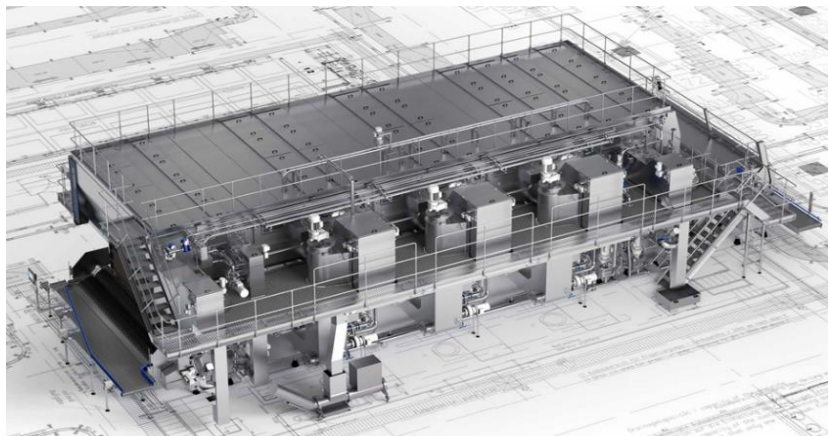


Consumo Eléctrico

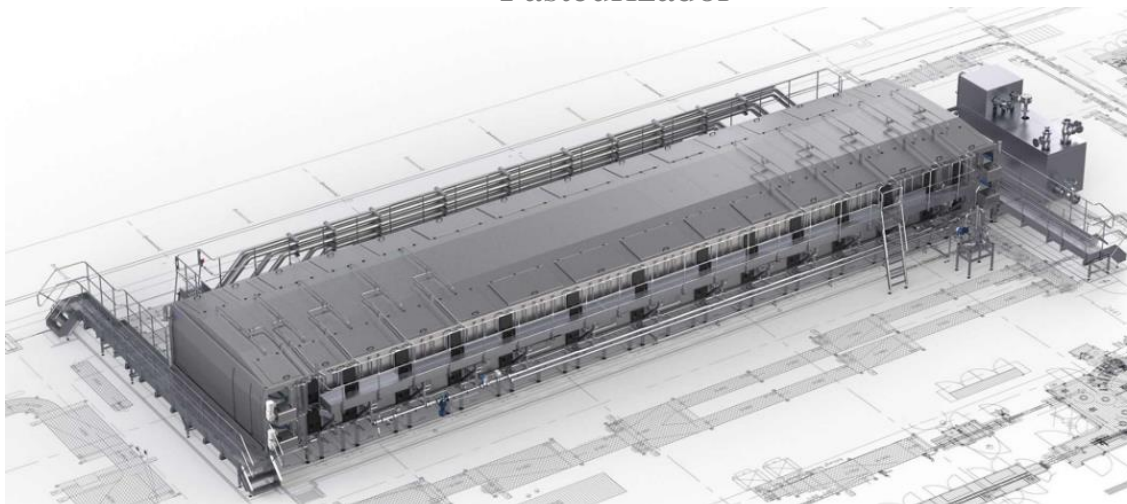


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Lavadora



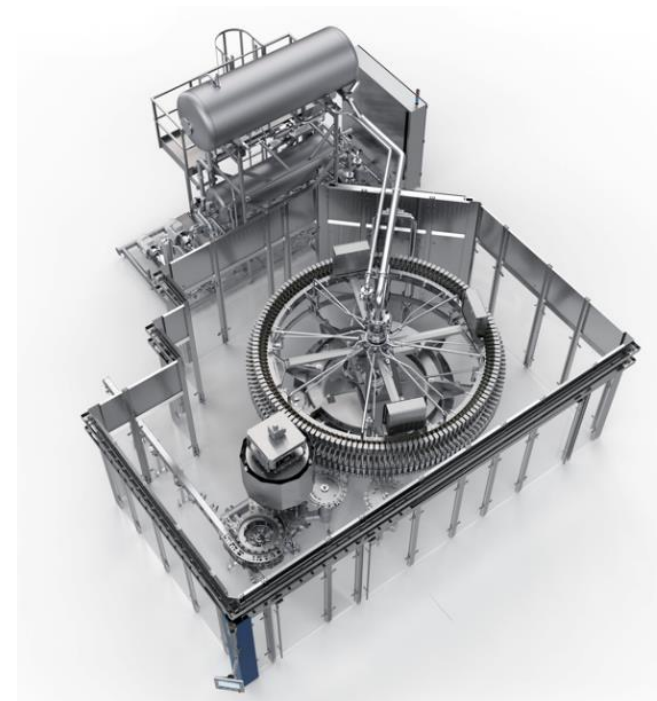
Pasteurizador



Valvulas

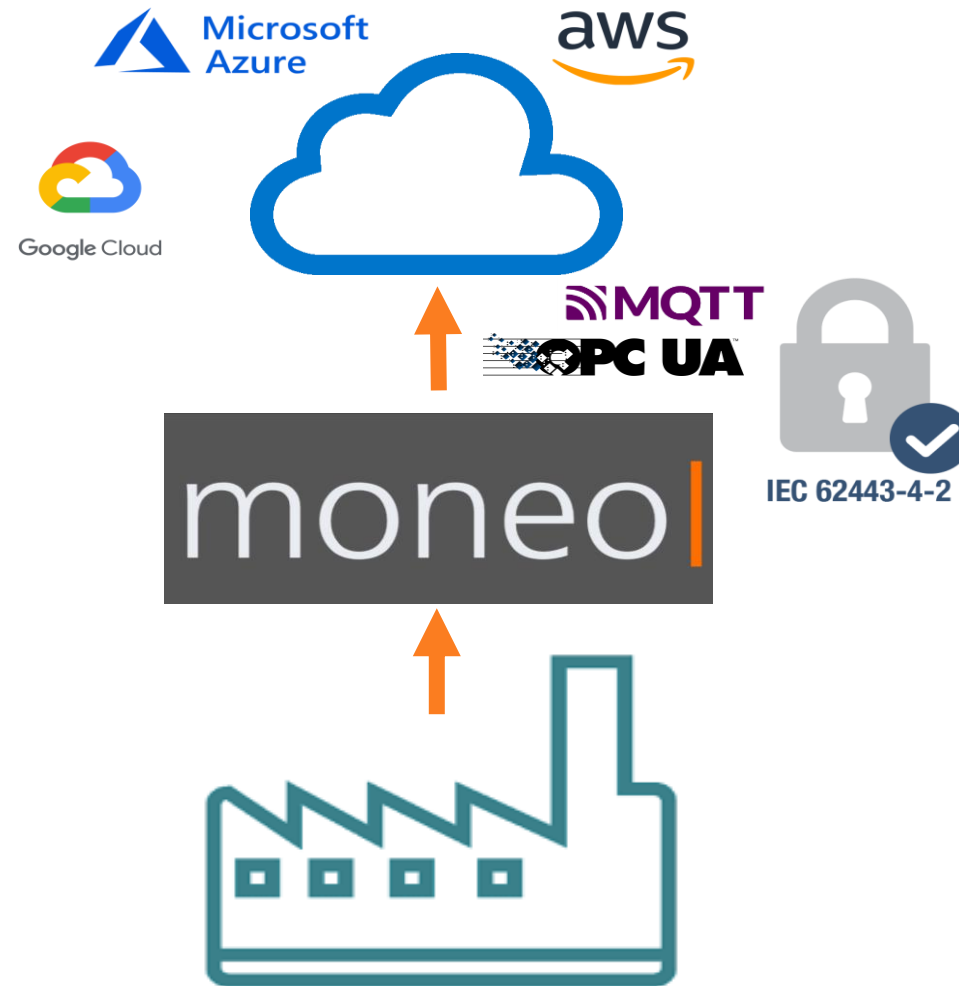


Llenadora



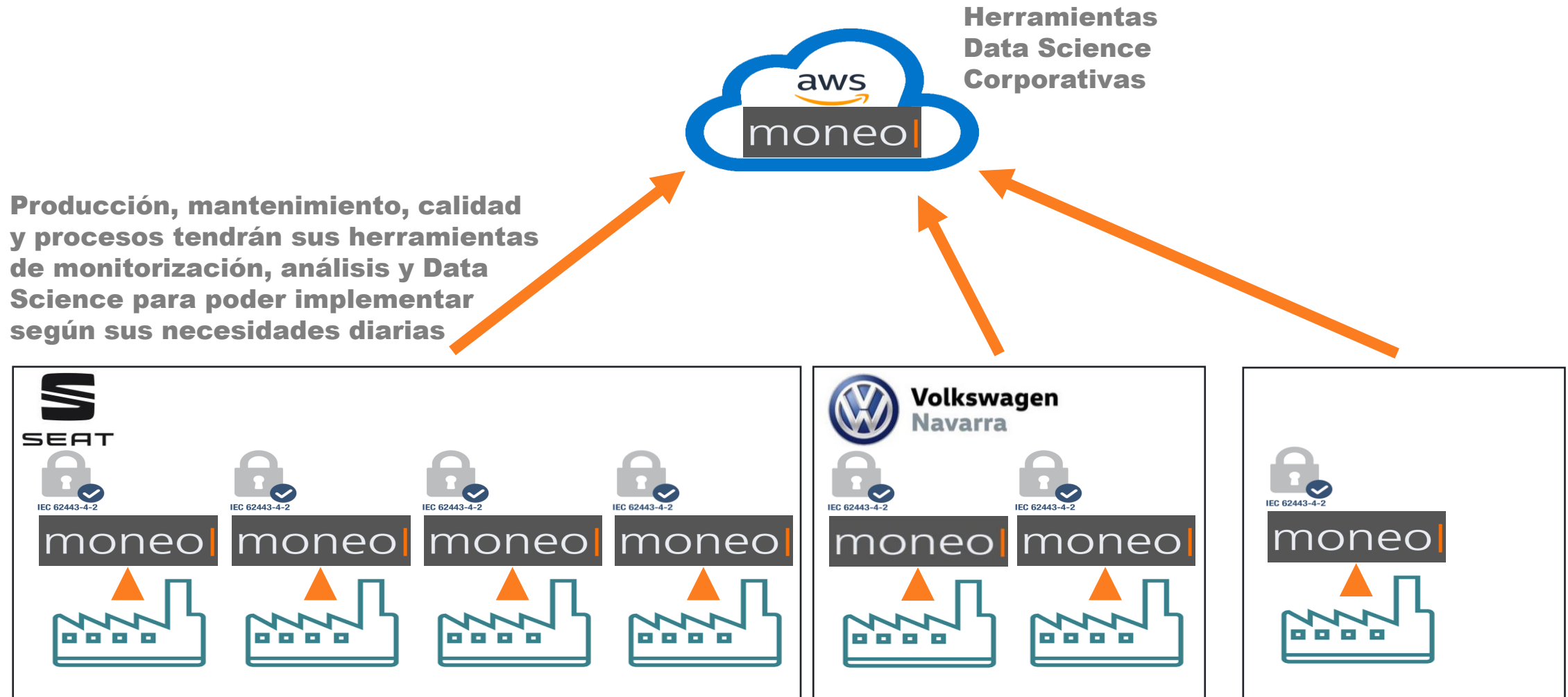
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Moneo como Proveedor Seguro de Información



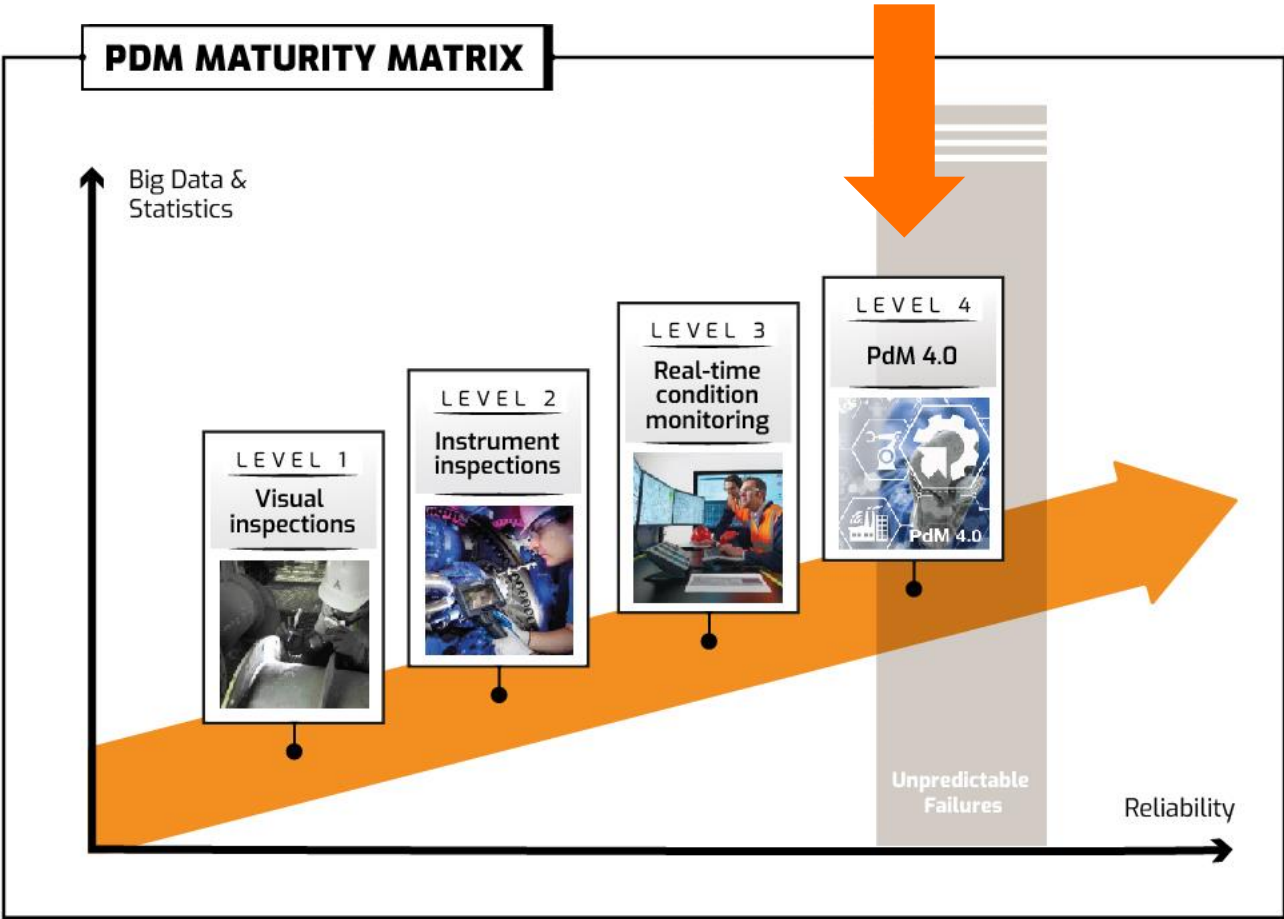
Moneo → Digitaliza de tu Empresa

Moneo como Proveedor Seguro de Información



Moneo → Digitaliza de tu Empresa

PdM4.0



Moneo → Digitaliza de tu Empresa

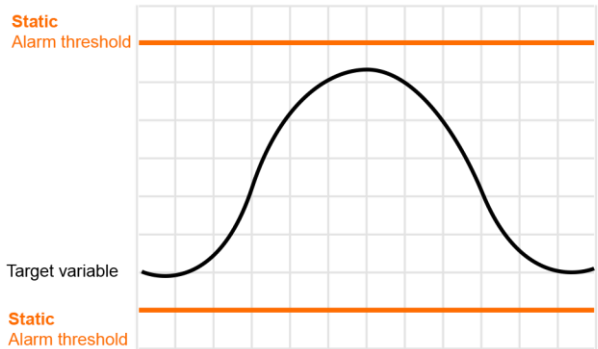
Moneo – Data Science Toolbox

**¿QUÉ DIRÍAS SI TE DIJERA QUE CON
UN SIMPLE WIZARD VAS A SER CAPAZ
DE GENERAR TUS ALGORITMOS DE
INTELIGENCIA ARTIFICIAL EN MENOS
DE 5 MINUTOS?**

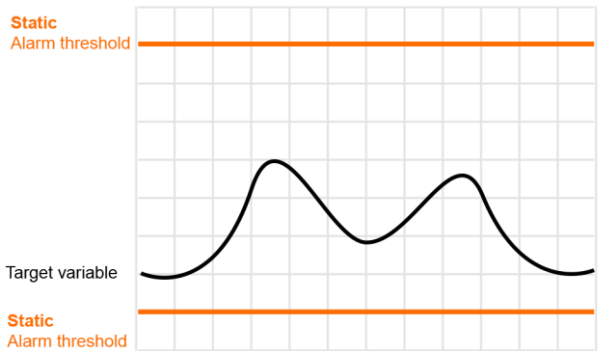
Monitorización Inteligente

Static process monitoring

Normal
condition

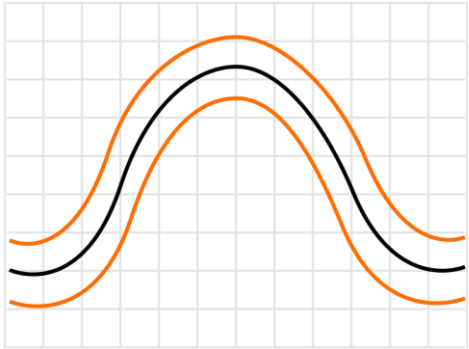


Anomaly
condition

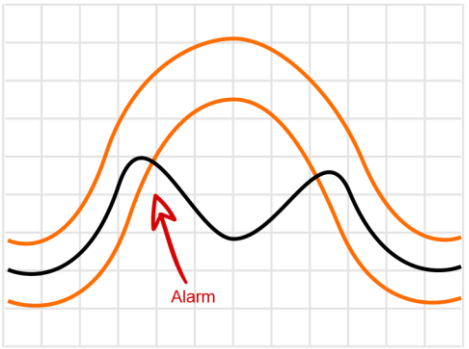


Dynamic process monitoring

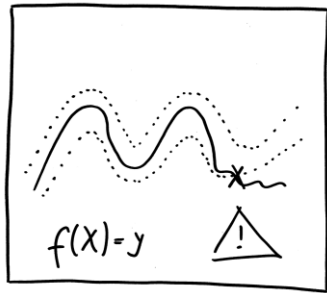
Dynamic
Alarm threshold
Target variable
Dynamic
Alarm threshold



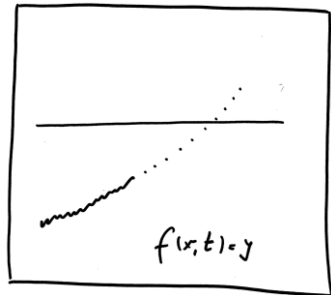
Dynamic
Alarm threshold
Target variable
Dynamic
Alarm threshold



PdM4.0



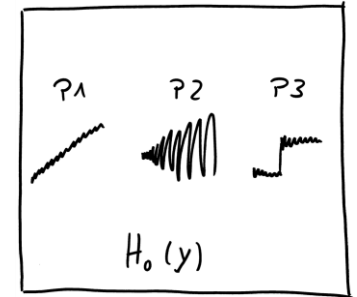
SmartLimitWatcher
Intelligent process
monitoring



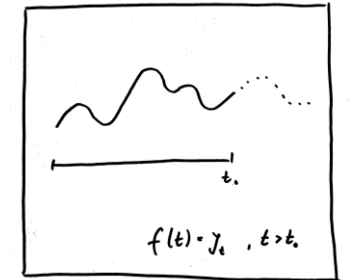
LifetimeEstimator
Predictions for
smart maintenance

SLW	PM
LE	VP

PatternMonitor
Automated pattern
detection



ValuePredictor
Timeseries
forecasting

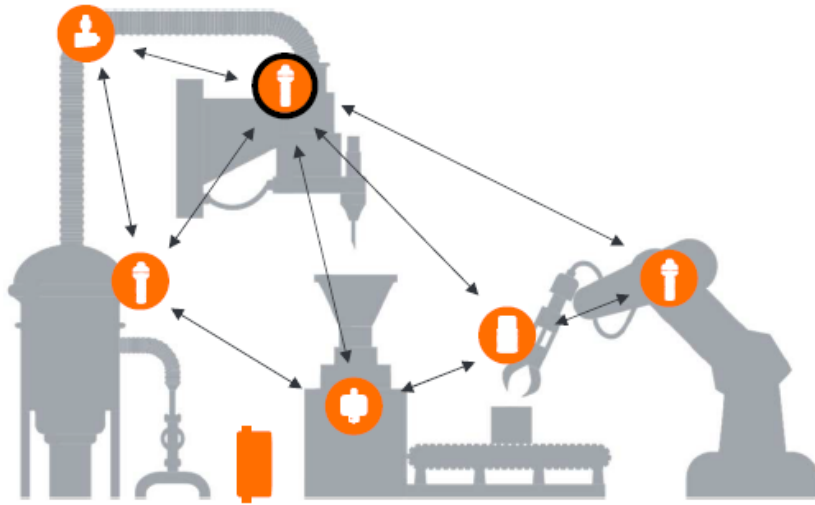


... More features in planning

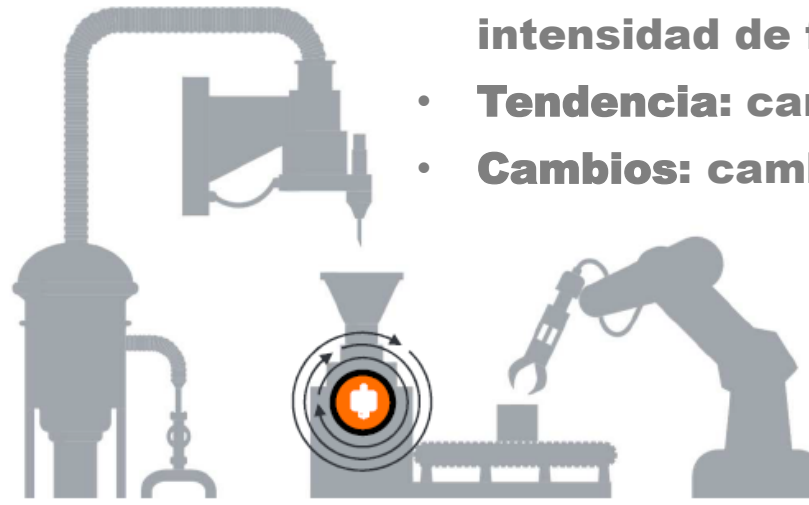
Diferencias entre SLW y PAM

- Usando métodos estadísticos, PAM chequea cambios de la variable crítica del proceso con uno de los siguientes patrones

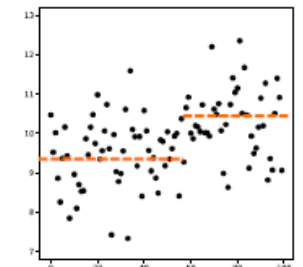
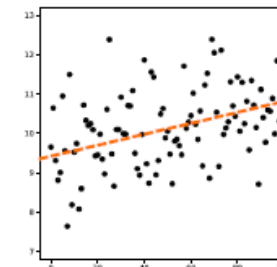
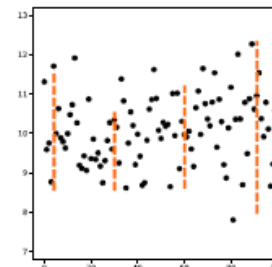
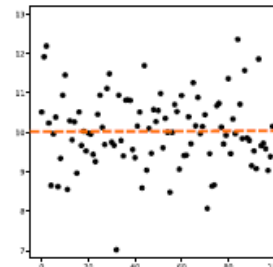
- **Volatilidad:** aumento o disminución de la intensidad de fluctuación
- **Tendencia:** cambio gradual de nivel
- **Cambios:** cambios repentinos de nivel



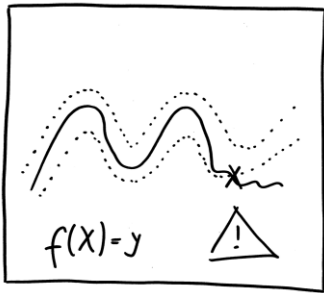
SmartLimitWatcher



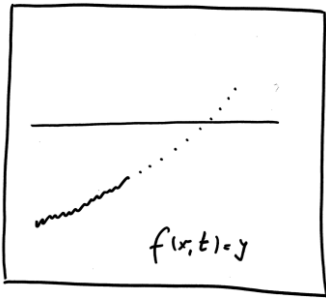
PatternMonitor



PdM4.0



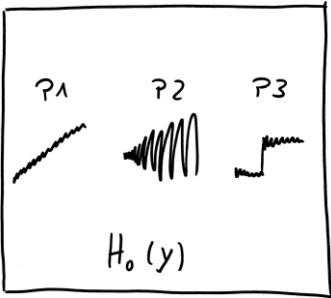
SmartLimitWatcher
Intelligent process
monitoring



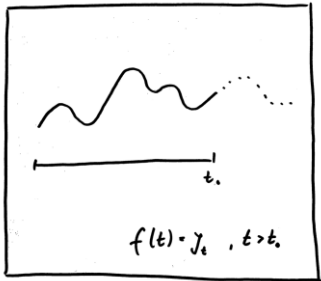
LifetimeEstimator
Predictions for
smart maintenance

SLW	PM
LE	VP

PatternMonitor
Automated pattern
detection



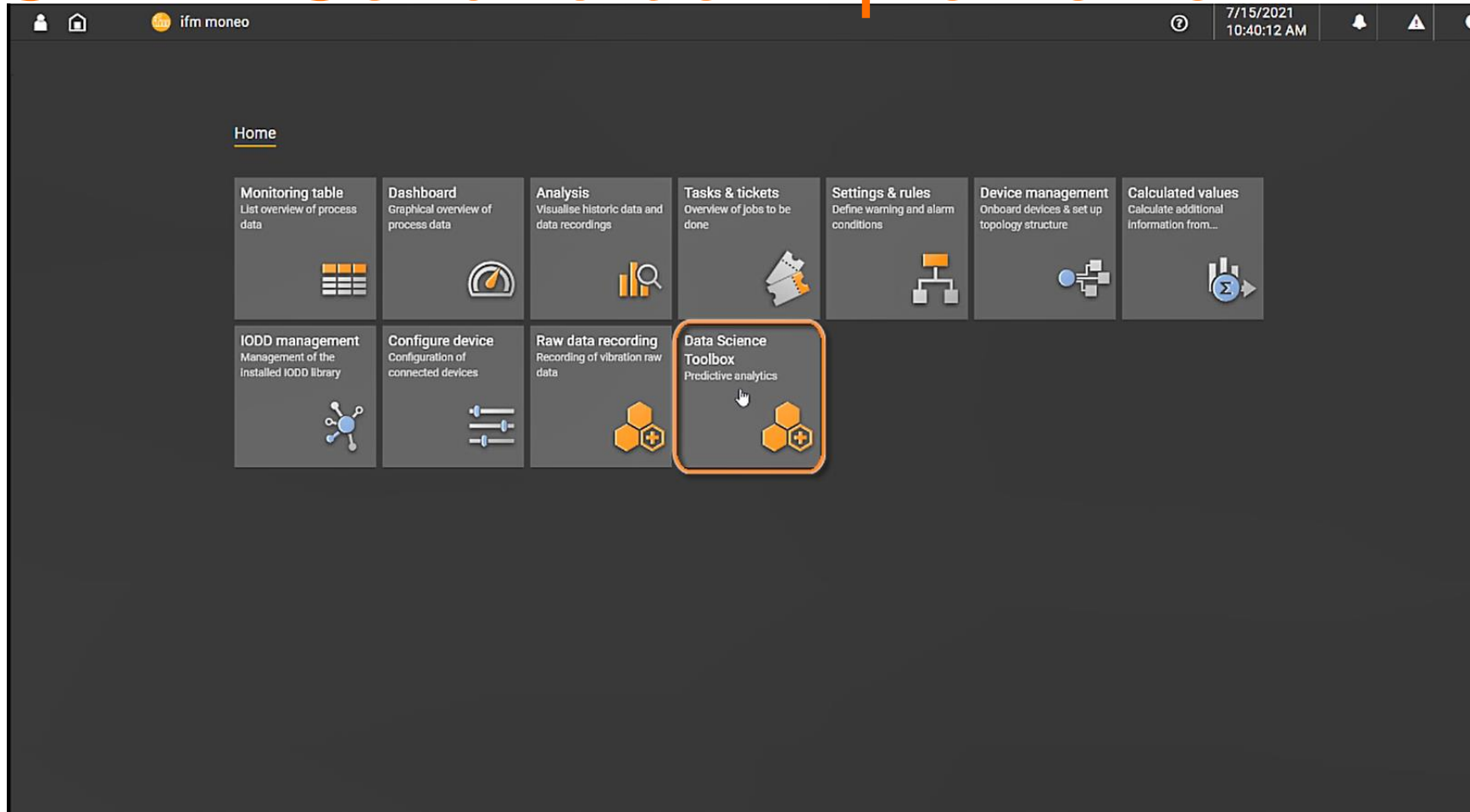
ValuePredictor
Timeseries
forecasting



... More features in planning

Moneo – Data Science Toolbox

SLW – Sencillo de Implementar



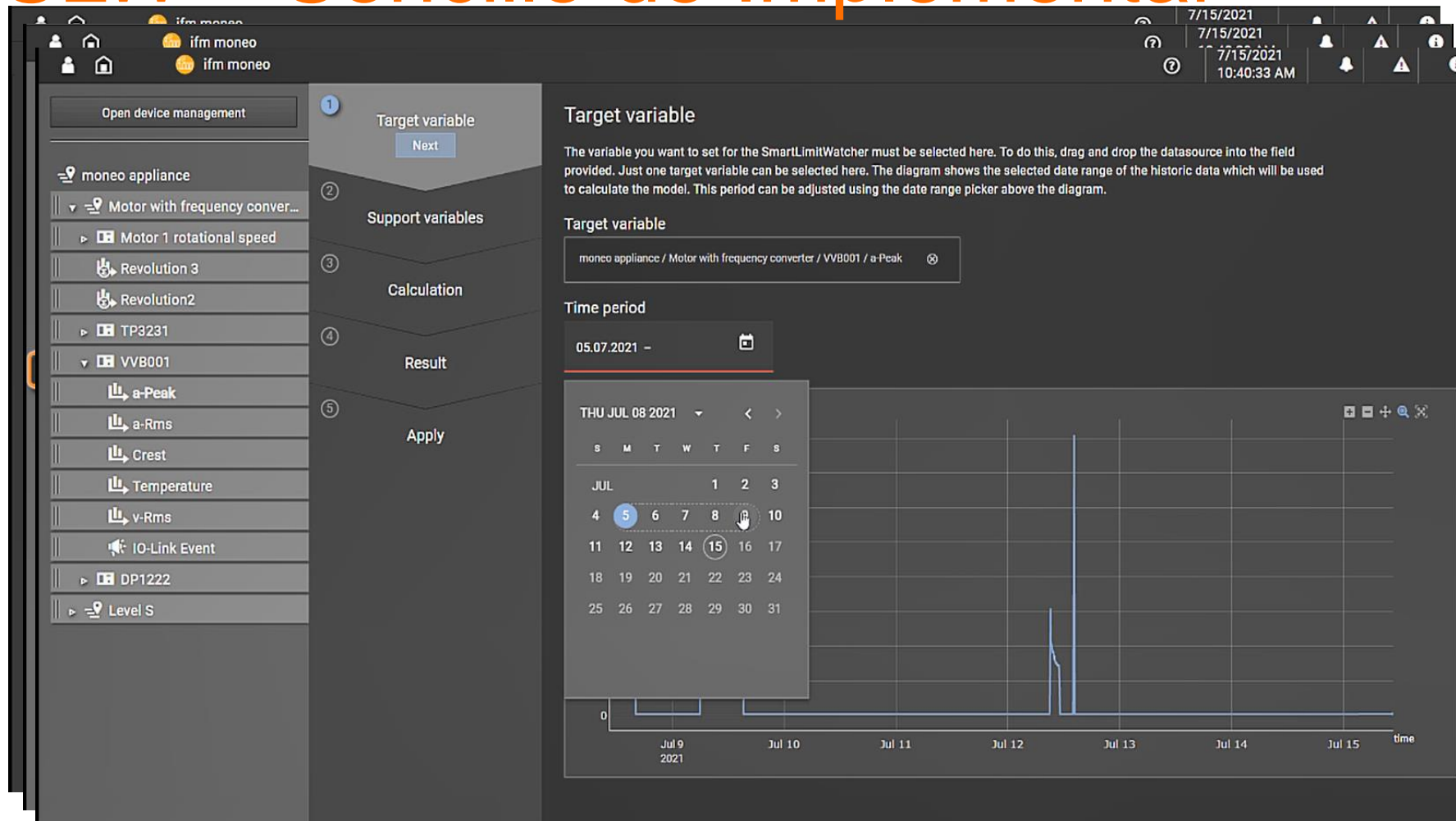
SLW – Sencillo de Implementar

The screenshot displays the Moneo Data Science Toolbox interface. The left sidebar shows a tree view of the device hierarchy: 'moneo appliance' > 'Motor with frequency conver...' > 'Motor 1 rotational speed' > 'Revolution 3' > 'Revolution2' > 'TP3231' > 'VVB001' > 'a-Peak'. The 'a-Peak' item is highlighted with an orange box, and an orange arrow points from it to the 'a-Peak' row in the table.

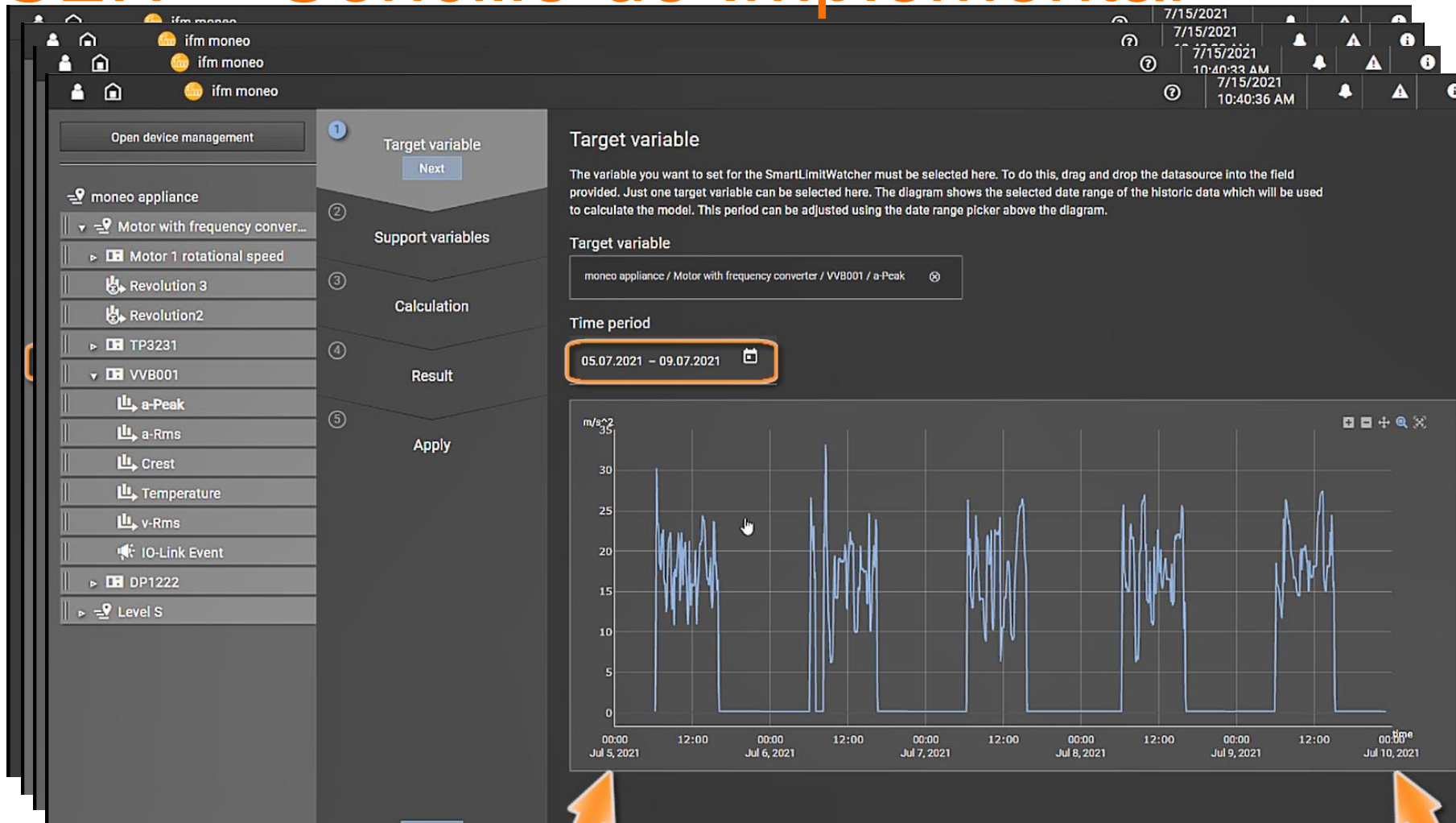
The main panel shows the 'Smart limit watcher' configuration for the 'moneo appliance / Motor with frequency converter / VVB001 / a-Peak'. The table below lists the monitoring parameters and their thresholds.

Execute monitoring	Lower alarm threshold	Lower warning threshold	Upper warning threshold	Upper alarm threshold	Status	Actions
<input type="checkbox"/> a-Peak	<input type="checkbox"/>	None	None	<input type="checkbox"/>	Model	

SLW – Sencillo de Implementar



SLW – Sencillo de Implementar



SLW – Sencillo de Implementar

The screenshot shows the Moneo Data Science Toolbox SLW (Simple Wizard) interface. The interface is divided into several sections:

- Left Sidebar:** A tree view of data sources. The selected path is `moneo appliance / Motor with frequency converter / VVB001 / a-Peak`. Other visible paths include `Motor 1 rotational speed / Revolution`, `TP3231 / Temperature`, `DP1222 / Voltage`, and `Level S`.
- Central Wizard Area:** A vertical stack of steps numbered 1 to 5:
 - 1. Target variable: Drop a datasource node
 - 2. Support variables: Next
 - 3. Calculation
 - 4. Result
 - 5. Apply
- Right Panel:**
 - Support variables:** A text box explaining that at least one data source must be selected. It provides instructions on how to select support variables from the navigator.
 - Target variable:** A dropdown menu showing the selected path: `moneo appliance / Motor with frequency converter / VVB001 / a-Peak`.
 - Table:** A table with 4 columns: Indicator, Path, Completeness, and Actions. It lists the selected variables and their completeness status.

Indicator	Path	Completeness	Actions
✓ Ok	moneo appliance / Motor with frequency converter / DP1222 / Voltage	100.00 %	✕
✓ Ok	moneo appliance / Motor with frequency converter / VVB001 / a-Rms	100.00 %	✕
✓ Ok	moneo appliance / Motor with frequency converter / VVB001 / v-Rms	100.00 %	✕
✓ Ok	moneo appliance / Motor with frequency converter / TP3231 / Temperature	100.00 %	✕
✓ Uncertain	moneo appliance / Motor with frequency converter / Motor 1 rotational speed / Revolution	40.02 %	✕

SLW – Sencillo de Implementar

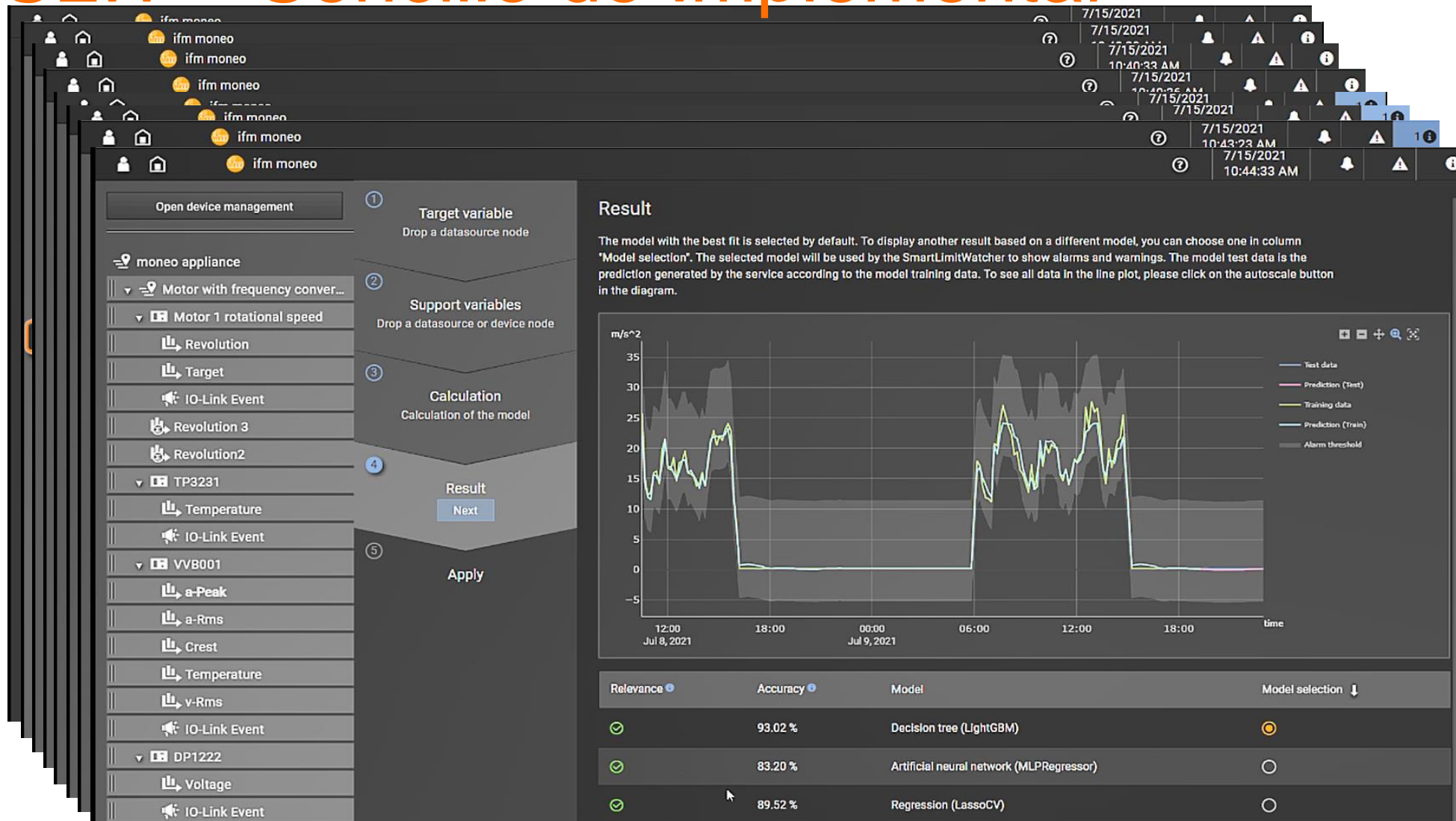
The screenshot shows the Moneo Data Science Toolbox SLW (Sencillo de Implementar) interface. The interface is divided into several sections:

- Left Sidebar:** A tree view showing the data source hierarchy. The selected path is: moneo appliance > Motor with frequency converter > Motor 1 rotational speed > Revolution.
- Central Wizard Area:** A vertical stack of steps: 1. Target variable (Drop a datasource node), 2. Support variables (Next), 3. Calculation, 4. Result, 5. Apply.
- Right Panel:**
 - Support variables:** A section explaining that at least one data source must be selected. It lists the target variable: moneo appliance / Motor with frequency converter / VVB001 / a-Peak.
 - Table of Indicators:** A table showing the completeness of various indicators. The table has columns: Indicator, Path, Completeness, and Actions.

Table of Indicators:

Indicator	Path	Completeness	Actions
Ok	moneo appliance / Motor with frequency converter / DP1222 / Voltage	100.00 %	🗑️
Ok	moneo appliance / Motor with frequency converter / VVB001 / a-Rms	100.00 %	🗑️
Ok	moneo appliance / Motor with frequency converter / VVB001 / v-Rms	100.00 %	🗑️
Ok	moneo appliance / Motor with frequency converter / TP3231 / Temperature	100.00 %	🗑️
Ok	moneo appliance / Motor with frequency converter / Revolution2	86.12 %	🗑️
Uncertain	moneo appliance / Motor with frequency converter / Motor 1 rotational speed / Revolution	40.02 %	🗑️

SLW – Sencillo de Implementar



SLW – Sencillo de Implementar

The interface is titled "SLW – Sencillo de Implementar". It features a sidebar on the left with a tree view of devices and variables. The main area is divided into two columns. The left column contains a configuration panel with five steps: 1. Target variable (Drop a datasource node), 2. Support variables (Drop a datasource or device node), 3. Calculation (Calculation of the model), 4. Result (Show model in diagram), and 5. Apply. The right column is titled "Apply" and contains instructions for setting dynamic thresholds. It includes checkboxes for "Dynamic lower alarm threshold" and "Dynamic upper alarm threshold", both of which are checked. Below these are dropdown menus for "Set warning threshold" with options "Early" and "Late". A graph at the bottom shows "m/s^2" on the y-axis and "time" on the x-axis. The graph displays training data, test data, prediction (train), prediction (test), alarm threshold, and warning threshold. A legend on the right side of the graph identifies these elements. The graph shows a significant drop in acceleration around July 8, 2021, 19:44:45, which is highlighted by a red triangle indicating a "Historic threshold event".

Target variable
Drop a datasource node

Support variables
Drop a datasource or device node

Calculation
Calculation of the model

Result
Show model in diagram

Apply

Apply

In this step you can activate smart dynamic upper or lower alarms and warning thresholds for the selected target variable. The warning can be customised by the intensity level. If you want to be informed early in critical situations, you only need to select the corresponding value from the drop-down list. To find the right level the diagram shows historic threshold warnings based on your selection.

Alarms based on dynamic thresholds

Set alarm threshold:

☒ Dynamic lower alarm threshold ☒ Dynamic upper alarm threshold

Set warning threshold:

Dynamic lower warning threshold: Early Dynamic upper warning threshold: Late

Graph Data:

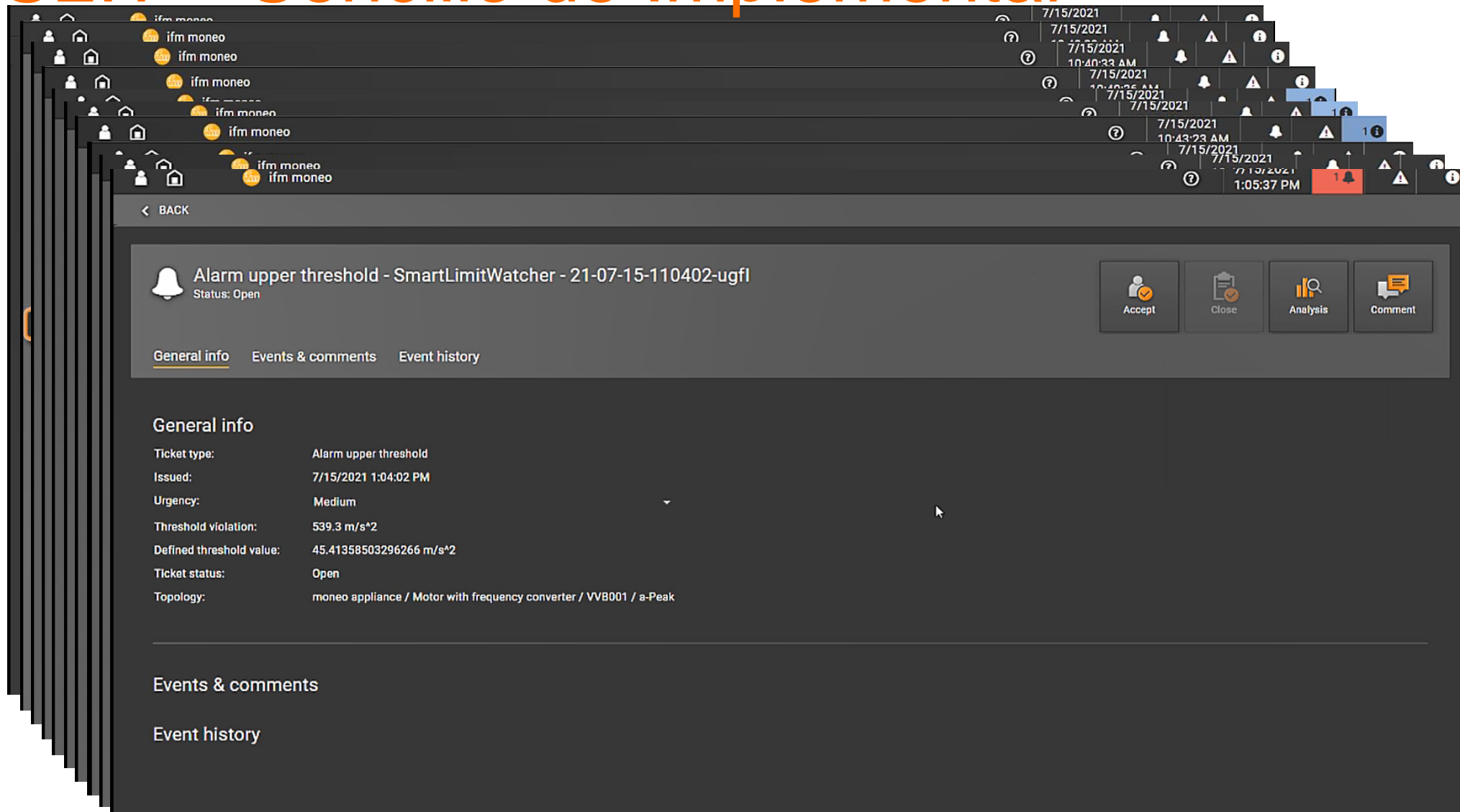
- Upper alarm threshold: 11.33 m/s²
- Upper warning threshold: 6.157 m/s²
- Training data: 0.2000 m/s²
- Prediction (Train): 0.1082 m/s²
- Lower warning threshold: -3.274 m/s²
- Lower alarm threshold: -5.244 m/s²

Legend:

- Historic threshold alarms
- Historic threshold warnings
- Test data
- Prediction (Test)
- Training data
- Prediction (Train)
- Alarm threshold
- Warning threshold
- Historic threshold events
- Upper alarm thresholds:0
- Lower alarm thresholds:0
- Upper warning thresholds:0
- Lower warning thresholds:0

Dynamic threshold profile

SLW – Sencillo de Implementar



Gracias!

Iker Gomez Valencia

