



European Factory  
Platform

**<<PREMAR>>**

**EFPF Open Call Pitching and Exhibition**

**27-28.09.2022**

**<<Alba Domínguez, CTAG>>**

- **Brief Partner Introduction**

**Cabomar Congelados** is a company incorporated with the purpose of importing, exporting, marketing and handling fishery products and all kinds of food products in general. Mainly, it is dedicated to the **transformation and commercialization of fish products** through distributor brands.

**CTAG, the Automotive Technology Center of Galicia**, is an entity dedicated to the **development, research and technological innovation in the automotive sector**. CTAG works in the different stages of the development of new products and processes, from applied research to series life validation.



PREMAR

- **Project Overview**

**PREMAR “Monitoring, Analytics and Predictive Maintenance of Machinery in CABOMAR”** aimed to prevent machinery failures in the fish processing industry, by using the EFPF platform and tools.

- **Main idea/concept**

Fish and seafood refrigeration and manufacturing is a harsh environment: humidity and aggressive water are everywhere, and machinery suffers from high rates of unexpected failures, disrupting production and causing large losses.

As a solution, CABOMAR and CTAG aimed to **integrate EFPF into the line, validating the tools and sharing lessons learned with the community**. The goal was to improve machine reliability in a harsh manufacturing environment by validating the EFPF core and the monitoring and data analysis tools.

- **Project Objectives**

- CTAG and CABOMAR wanted to integrate the EFPP tools for the **prevention of existing failures in the chosen machinery of CABOMAR** and **improve the reliability of these machines** in their manufacturing environment.
- **Validation** and testing of EFPP tools for integration and interoperability would be performed. This would involve the integration of EFPP, especially in terms of the data spine. EFPP would be integrated to interface with 1 CABOMAR machine.
- Once this was done, validation and testing of EFPP tools would be performed: factory connector (monitoring), real time anomaly detection (data analysis) and predictive maintenance. These 3 tools would be tested on 1 machine.
- As a **dissemination** measure of the project results, at least 4 events would be used to disseminate the results, 1 organized by the consortium.



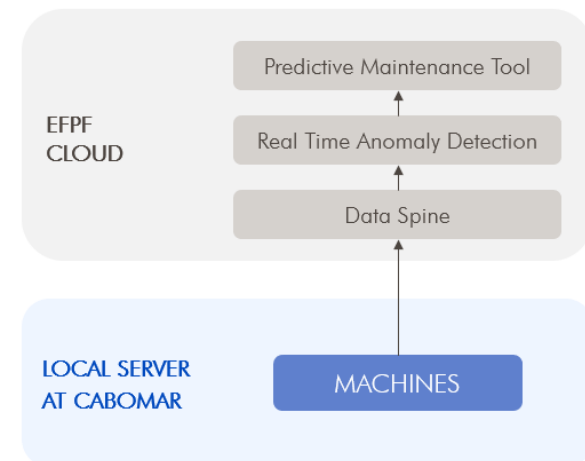
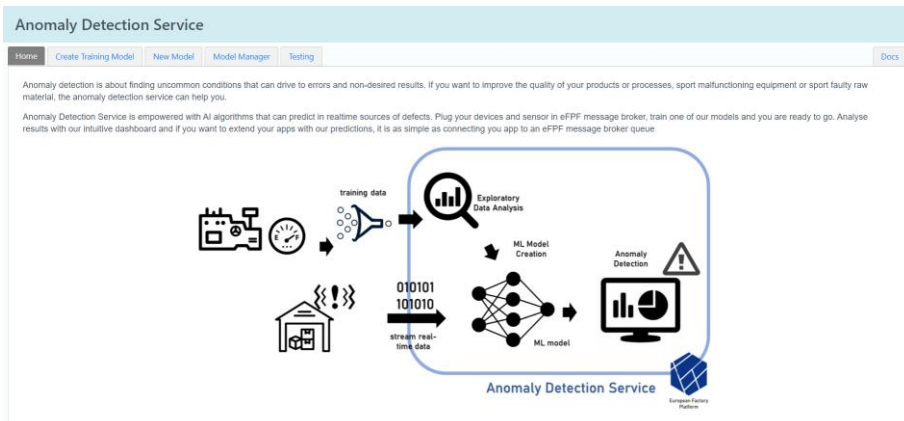
## • Components/Architecture

The initially selected components to solve the CABOMAR predictive maintenance objective, were:

- The EFPF core, the **Data Spine**.
- The **Real-Time anomaly detection tool**, to perform data analytics.
- The **Predictive Maintenance tool**, to allow an intelligent AI behaviour.
  - ROAM
  - Visual Data Analytics.
  - Deep Learning Toolkit.

The initial idea of the solution was:

- A **local server** located at CABOMAR to collect data from the machine.
- **EFPF cloud** where the Data Spine, the Real Time Anomaly Detection and the Predictive Maintenance Tools would be running.



- **Stages**

The initial plan was to perform a **two stages** analysis:

- First a **historical - training stage**, in which we would manually create a dataset composed by historical registers of the machines. This would allow to create prediction models and eventually find data correlations.
- Lastly, a **real time operation stage**, in which the data would be transferred from the field machine to the EFPF cloud in real time. The created prediction models would be invoked to consume their output in real time.



General Information about Alarms	
Total Number of Records	176386
Total Number of Records with an Alarm	696
LM_TER_4_Cubierta_abierta	19
LM_TER_6_Presion_de_Aire_muy_baja	47
LM_TER_54_Film_Inferior_Agotado	26
LM_TER_55_Film_Superior_1_Agotado	12
LM_TER_67_Sistema_de_elevacion_no_esta_abajo	15
LM_TER_98_Posicion_de_Limpieza	7
LM_TER_106_Cubierta_Trasera_de_Formado_Abierta	10
LM_TER_107_Cubierta_Trasera_de_Formado_Abierta	13
LM_TER_108_Cubierta_Frontal_de_Formado_Abierta	28
LM_TER_111_Cubierta_Trasera_de_Soldadura_Abierta	20
LM_TER_112_Cubierta_Trasera_de_Soldadura_Abierta	15
LM_TER_113_1_Cubierta_Frontal_de_Soldadura_Abierta	13
LM_TER_114_Cubierta_del_Corte_transversal_Abierta	30
LM_TER_119_Parada-Enciende_Resistencias	15
LM_TER_120_Parada-Enciende_Bombas_de_Vacio	88
LM_TER_121_Parada-Modo_Manual	116
LM_TER_123_Reserva-se_Prepara_para_empezar	530
LM_TER_124_Modo-En_Automatico	492



# Technical Achievements

- Issues

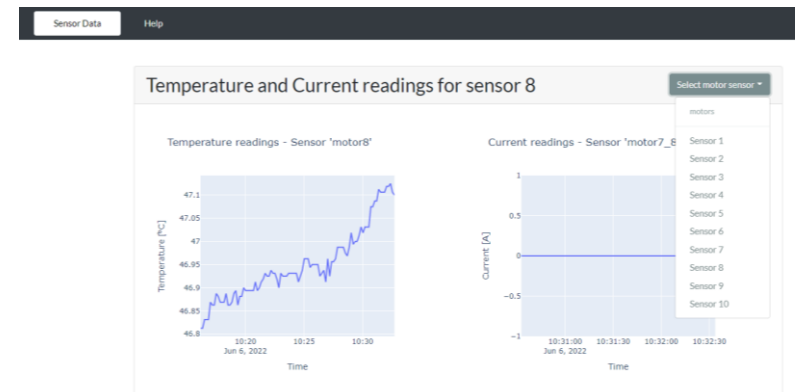
## Phase 1:

The evaluation of the platform was raising a series of issues related with **availability of the tools, documentation, bugs** and other typical problems when developing a software platform.

## Phase 2:

The **timing between EFPF and PREMAR** caused that, at the end of PREMAR, the platform was not fully ready to fulfill the projected functionalities. In that moment, there was not a vision of a platform by the user, but a set of **disconnected modules**. This made the platform not to be **fully ready for an autonomous use by a manufacturing company**.

From PREMAR, hints and recommendations were provided as end user feedback.



- **Deviations from your WP / Actual KPIs against initial one**

INITIAL KPIS	ACTUAL KPIS
<p><b>KPI – 1:</b> 3 EFPF tools integrated:</p> <ul style="list-style-type: none"> <li>- Factory Connector tool (tool 1).</li> <li>- Anomaly detection tool (tool 2).</li> <li>- Predictive Maintenance tool (tool 3).</li> </ul>	<p><b>KPI – 1:</b> 3 EFPF tools integrated:</p> <ul style="list-style-type: none"> <li>- The chosen tools changed to the “Anomaly detection tool” and the “Predictive Maintenance tool”: ROAM, Deep Learning Toolkit, Visual Data Analytics.</li> <li>- The overall timing issues between EFPF and PREMAR has caused to test on an unfinished version of the platform, so that it has not been possible to PREMAR to perform a proper integration of the tools.</li> </ul>
<p><b>KPI – 2:</b> 3 iterations of analyses on 2 machines.</p>	<p><b>KPI – 2:</b> 3 iterations of analyses on 2 machines:</p> <ul style="list-style-type: none"> <li>- The validation process was performed on 2 iterations: 1) documented in D2.1 and 2) performed at the very end of May 2022, documented in D2.2.</li> </ul>
<p><b>KPI – 3:</b> find 2 correlations between input data and machinery faults.</p>	<p><b>KPI – 3:</b> find 2 correlations between input data and machinery faults:</p> <ul style="list-style-type: none"> <li>- The timing issues have not allowed to obtain useful rules or correlations to explain the origin cause of the machinery stops registered in the provided datasets.</li> </ul>
<p><b>KPI – 4:</b> 2 machines monitored and analysed with the real-time and predictive maintenance tools.</p>	<p><b>KPI – 4:</b> 2 machines monitored and analysed with the real-time and predictive maintenance tools.</p> <ul style="list-style-type: none"> <li>- This KPI was updated to 1 machine during the project, as agreed with PREMAR coaches.</li> <li>- The commented issues did not allow to perform a proper monitoring and analyses of the CABOMAR data, during the PREMAR lifetime.</li> </ul>
<p><b>KPI – 5:</b> Each machine: at least 20 variables collected.</p>	<p><b>KPI – 5:</b> Each machine: at least 20 variables collected.</p> <ul style="list-style-type: none"> <li>- This has been achieved in the thermoformer machine, in which 52 process variables have been selected to be part of the study.</li> </ul>
<p><b>KPI – 6:</b> Reduce the annual number of incidents by 10%.</p>	<p><b>KPI – 6:</b> Reduce the annual number of incidents by 10%.</p> <ul style="list-style-type: none"> <li>- Due to the already mentioned timing issues in the development, it has not been possible to obtain useful rules or correlations, and therefore to reduce the number of incidences.</li> </ul>



# Impact Achievements

- **Dissemination Results**

- Physical events.
- LinkedIn posts.
- News on consortium websites (CTAG, CABOMAR).
- Open Call related interviews.



- **Exploitation Plan related to EFPF outcomes**

PREMAR is a validation project, and its focus was to integrate existing EFPF platform and tools and provide feedback to EFPF.

Key Exploitable Result	Potential Exploitation Strategy
Usage of the platform (CABOMAR)	Usage of the platform. Potential revenues up to 94k per year.
Consulting and implementation support to other manufacturing companies to use EFPF	Consulting. Implementation Support. Potential revenues up to 35k after 3 years.

Due to the highlighted timing issues, these potential KERs are conditioned to a further maturity state of the platform.



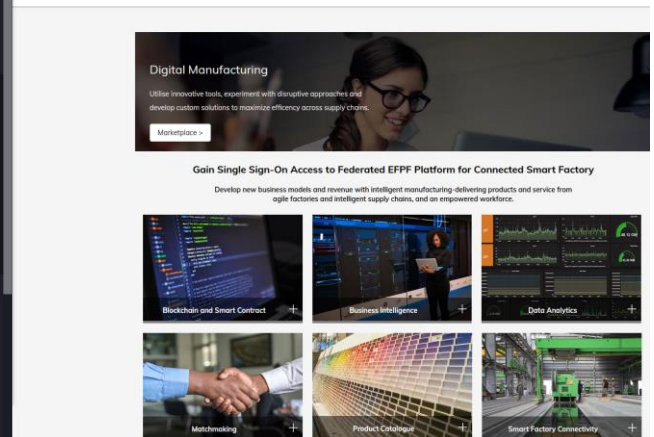
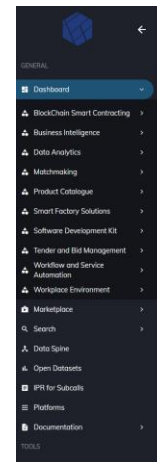
- **Summarize your EFPF Experience**

PREMAR was conceived as a **validation project**, to perform a constructive and objective testing of the platform from the point of view of a real manufacturing company with specific reliability problems.

The performed validation shows that EFPF is a **promising platform**, with very interesting features that can be very useful for the specific problems existing in CABOMAR. PREMAR is sure that EFPF will become a very relevant asset in the European landscape at the end of the project.

PREMAR has meant a new experience in European projects for CABOMAR and CTAG. Additionally, **CABOMAR has approached its digitalization challenges** using a different perspective which will be useful in the future.

PREMAR wants to thank the EFPF team, and especially the AIDIMME team as coaches, for their very valuable help, support and contribution to the development of the PREMAR subproject.





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Thank you for your attention!