



COORDINATED PRODUCTION  
FOR BETTER RESOURCE EFFICIENCY

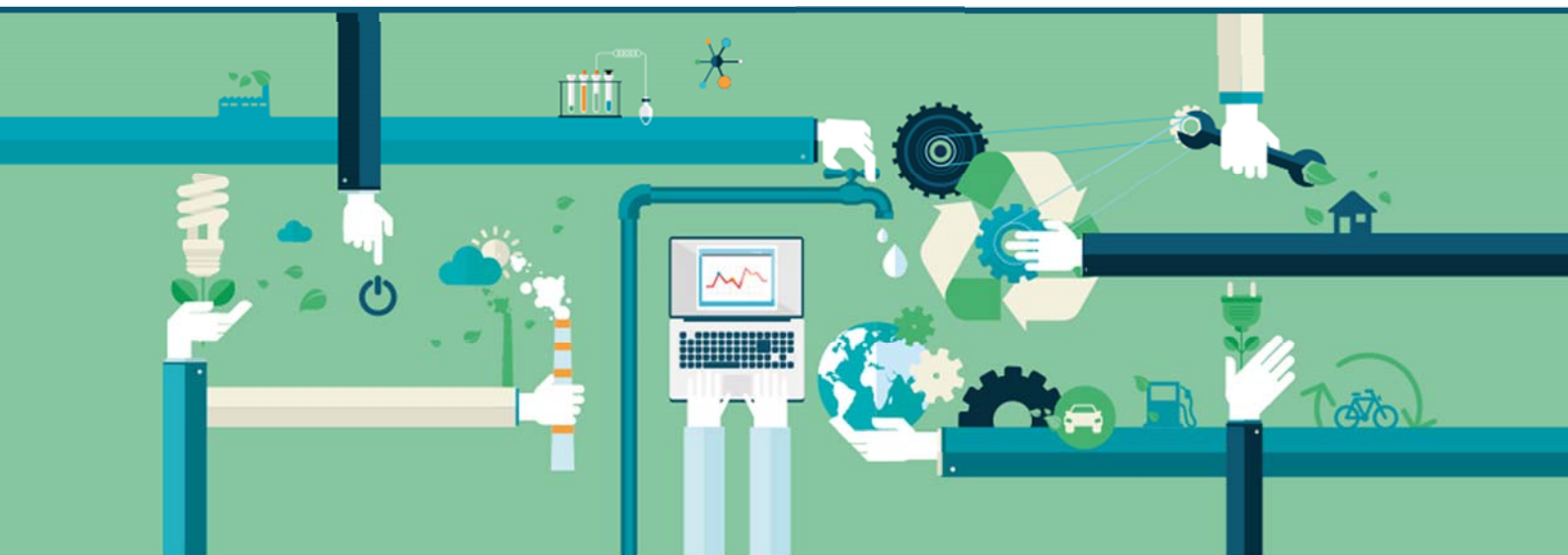
## D5.4 Prototype of the CoPro Integration Framework

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[www.spire2030.eu/copro](http://www.spire2030.eu/copro)



### Project Details

<b>PROJECT TITLE</b>	Improved energy and resource efficiency by better coordination of production in the process industries
<b>PROJECT ACRONYM</b>	<b>CoPro</b>
<b>GRANT AGREEMENT NO</b>	<b>723575</b>
<b>INSTRUMENT</b>	<b>RESEARCH AND INNOVATION ACTION</b>
<b>CALL</b>	<b>H2020-SPIRE-02-2016</b>
<b>STARTING DATE OF PROJECT</b>	<b>NOVEMBER, 1<sup>ST</sup> 2016</b>
<b>PROJECT DURATION</b>	<b>42 MONTHS</b>
<b>PROJECT COORDINATOR (ORGANIZATION)</b>	<b>PROF. SEBASTIAN ENGELL (TUDO)</b>

### THE COPRO PROJECT

The goal of CoPro is to develop and to demonstrate methods and tools for process monitoring and optimal dynamic planning, scheduling and control of plants, industrial sites and clusters under dynamic market conditions. CoPro pays special attention to the role of operators and managers in plant-wide control solutions and to the deployment of advanced solutions in industrial sites with a heterogeneous IT environment. As the effort required for the development and maintenance of accurate plant models is the bottleneck for the development and long-term operation of advanced control and scheduling solutions, CoPro will develop methods for efficient modelling and for model quality monitoring and model adaption.

### The CoPro Consortium

Participant No	Participant organisation name	Country	Organisation
<b>1 (Coordinator)</b>	Technische Universität Dortmund (TUDO)	DE	HES
<b>2</b>	INEOS Köln GmbH (INEOS)	DE	IND
<b>3</b>	Covestro Deutschland AG (COV)	DE	IND
<b>4</b>	Procter & Gamble Services Company NV (P&G)	BE	IND
<b>5</b>	Lenzing Aktiengesellschaft (LENZING)	AU	IND
<b>6</b>	Frinsa del Noroeste S.A. (Frinsa)	ES	IND
<b>7</b>	Universidad de Valladolid (UVA)	ES	HES
<b>8</b>	École Polytechnique Fédérale de Lausanne (EPFL)	CH	HES
<b>9</b>	Ethniko Kentro Erevnas Kai Technologikis Anaptyxis (CERTH)	GR	RES
<b>10</b>	IIM-CSIC (CSIC)	ES	RES
<b>11</b>	LeiKon GmbH (LEIKON)	DE	SME
<b>12</b>	Process Systems Enterprise LTD (PSE)	UK	SME
<b>13</b>	Divis Intelligent Solutions GmbH (divis)	DE	SME
<b>14</b>	Argent & Waugh Ltd. (Sabisu)	UK	SME
<b>15</b>	ASM Soft S.L (ASM)	ES	SME
<b>16</b>	ORSOFT GmbH (ORS)	DE	SME
<b>17</b>	Inno TSD (inno)	FR	SME

### Document details

<b>DELIVERABLE TYPE</b>	<b>DEMO VIDEO</b>	
<b>DELIVERABLE NO</b>	<b>5.4</b>	
<b>DELIVERABLE TITLE</b>	Prototype of the CoPro Integration Framework	
<b>NAME OF LEAD PARTNER FOR THIS DELIVERABLE</b>	<b>LEIKON</b>	
<b>VERSION</b>	<b>1.0</b>	
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<b>ACTUAL DELIVERY DATE</b>	<b>JANUARY 07, 2019</b>	
<b>Dissemination level</b>		
<b>PU</b>	Public	<b>X</b>
<b>CO</b>	Confidential, only for members of the consortium (including the Commission)	

#### Abstract

To realize advanced distributed optimization and scheduling algorithms, many different IT systems must interact in a smooth and easy to handle manner. The CoPro Integration Framework supports current and future data communication technologies and will be used as a flexible interaction and orchestration master for distributed plant coordination and scheduling applications. An important goal of the CoPro Integration Framework is to shrink time and efforts to bring model based online applications into industrial use.

This deliverable is provided as a video which shows the engineering steps of the prototype to integrate model based applications into a heterogeneous IT landscape of different industrial IT systems in different control levels. The video will be public available at the web page of the CoPro project (<https://www.spire2030.eu/copro>).

#### REVISION HISTORY

The following table describes the main changes done in the document since it was created.

Revision	Date	Description	Author (Organisation)
<b>V1.0</b>	20.12.2018	Description of the video of the prototype of the CoPro Integration Framework	Enste, LeiKon
<b>V1.0</b>	04.01.2019	Final Approval	S. Engell, TUDO

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## Executive summary

The goal of task 5.2 of CoPro is to develop an engineering and runtime environment to realize data orchestration of site wide and also cross-site executions of distributed model based, scheduling, control and optimisation applications. The framework should have capabilities to integrate different sources and targets as well as different data calculation, transformation and validation functions required in distributed plant coordination solutions.

The requirements and the functional design of the CoPro Integration Framework are described in deliverable D5.3. A main motivation of the work done in task 5.2 is to develop a tool environment to integrate model based applications in an intuitive and easy way into an existing industrial IT environment of process plants. Model based applications provide an important contribution to optimized plant coordination solutions. The problem is still a gap to integrate offline evaluated models into an online production IT System environment. So the goal is to reduce obstacles to realize online model based applications for plant cooperation applications and other model based online solutions and to shrink effort and time to bring model based applications into industrial use.

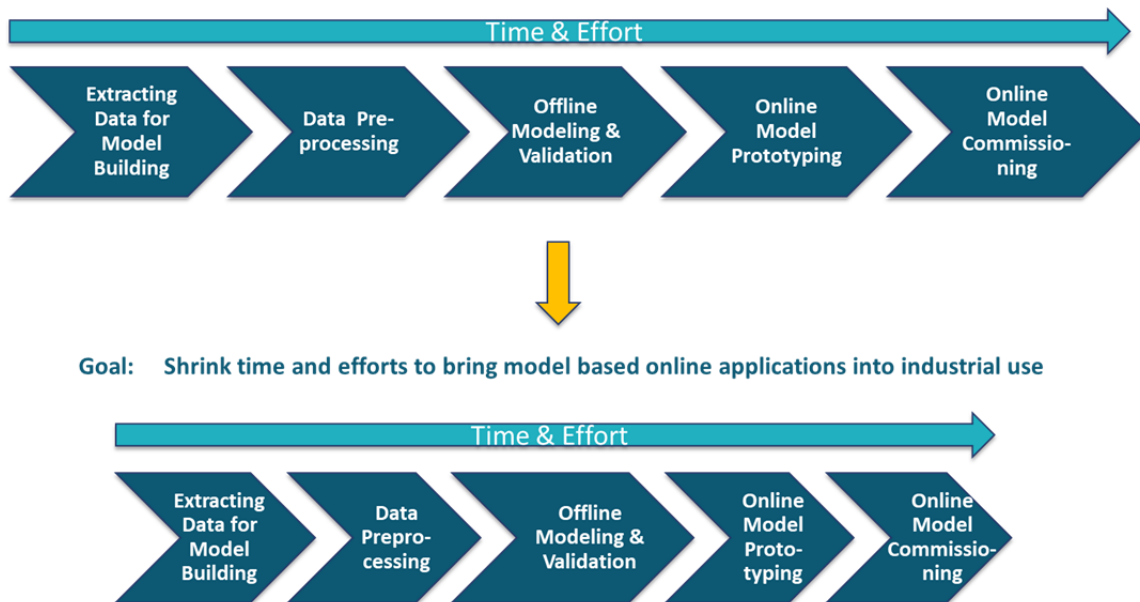


Figure 1: Motivation.

The approach is an IT Solution for real-time data orchestration of distributed model based plant coordination applications in process industries.

## D5.4 Prototype of the CoPro Integration Framework

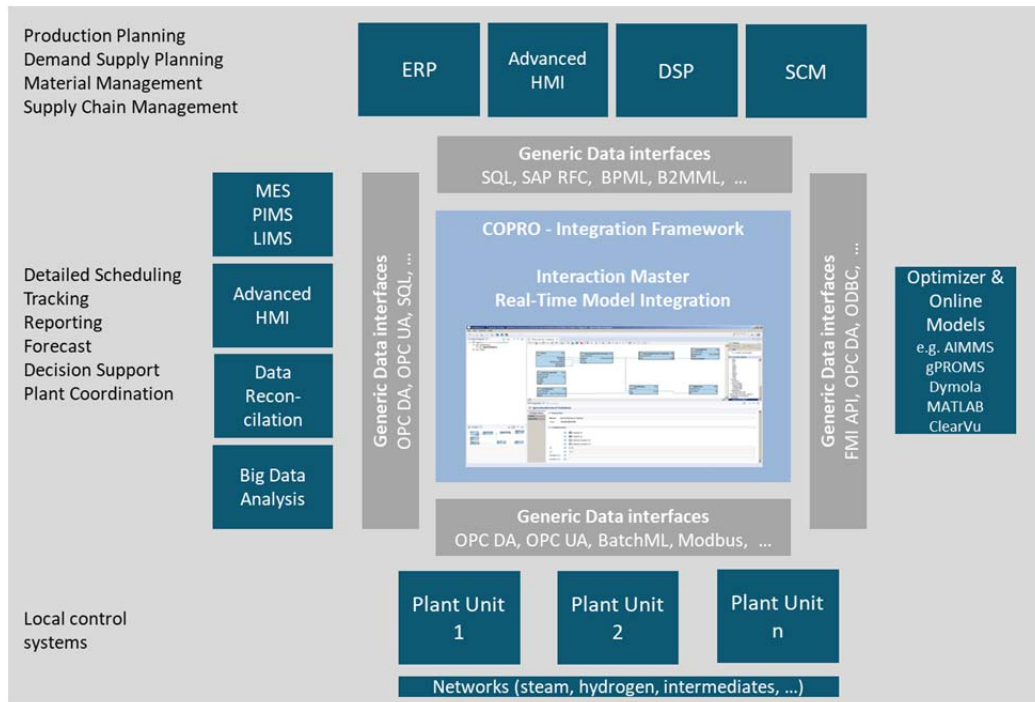


Figure 2: CoPro Integration Framework.

The video provided as deliverable D5.4 shows a first prototype of the CoPro Integration Framework developed by LeiKon in task 5.2. A use case is presented to demonstrate the handling of integrating a model based application developed exemplarily with Matlab into a typical IT-environment of a process plant. In the use case, three input variables of three different IT systems are needed to calculate the model output result which should be provided to a planning tool.

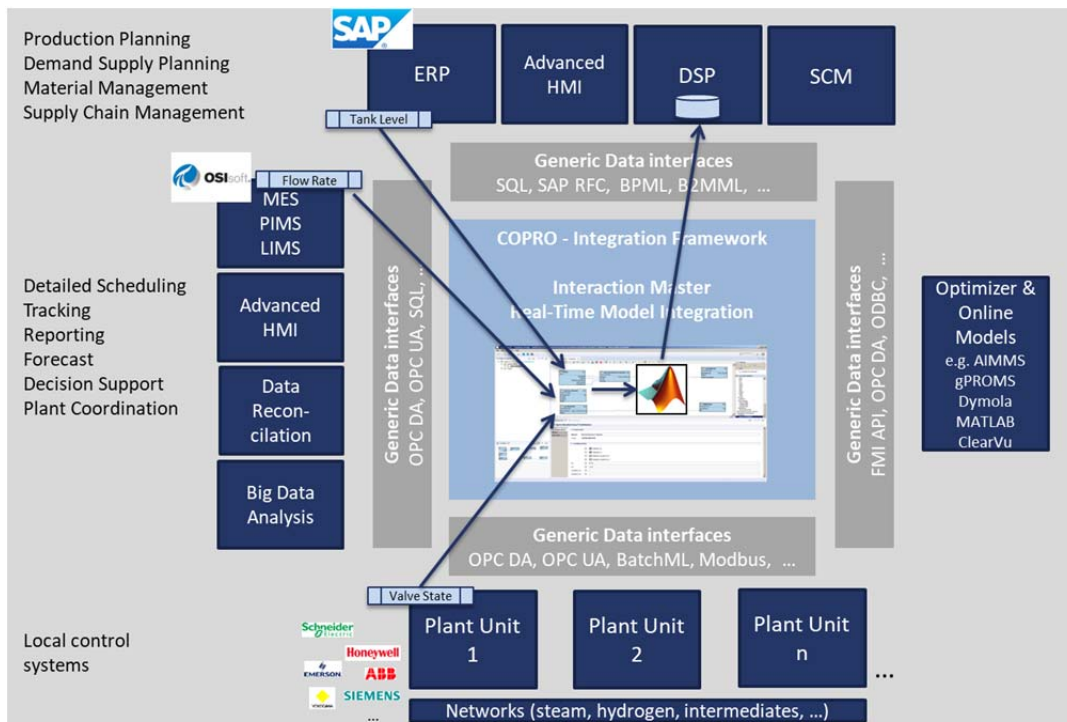


Figure 2: Use case shown in the video of D5.4.

## D5.4 Prototype of the CoPro Integration Framework

The video shows how to build a runtime engine which includes the cyclic import of real-time data exemplarily of

- a DCS by using the OPC data communication technology
- a Production Information Management System (PIMS)
- SAP as a representative of an ERP System.

These data will be used to trigger the model execution. The result of the model calculation will be written to a SQL data base which belongs in that use case to a Demand Supply Planning Tool (DSP). The result will be used to optimize the planning of a production site.

The video will be provided at the CoPro website (<https://www.spire2030.eu/copro>) in the section OUTCOMES/--Deliverables.