Coordinating Optimisation of Complex Industrial Processes

COCOP in a Nutshell

Need

European Process Industry faces a strong need to increase **product quality** and **reduce operating costs and** its **environmental footprint**. An industrial plant comprises continuous and/or batch unit processes, where the complexity stems from its dynamic properties, so a **plant-wide monitoring** and **control is needed.**

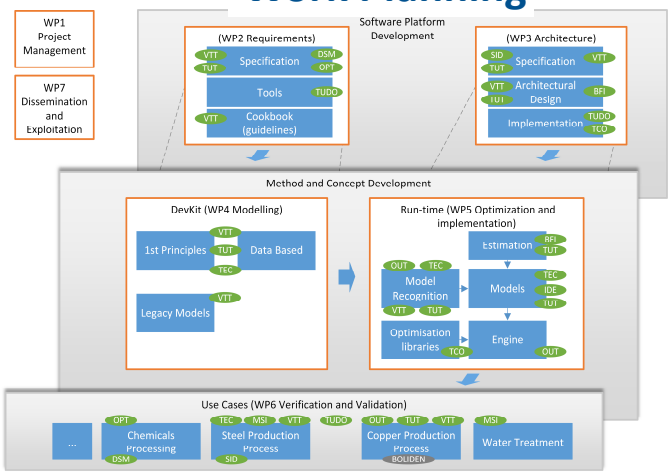
Vision

Complex process industry plants will be optimally run by the operators with the guidance of a coordinating, real-time optimisation system.

Goal

To enable plant-wide monitoring and control by using the model-based, predictive, coordinating optimisation concept in integration with plant´s automation systems

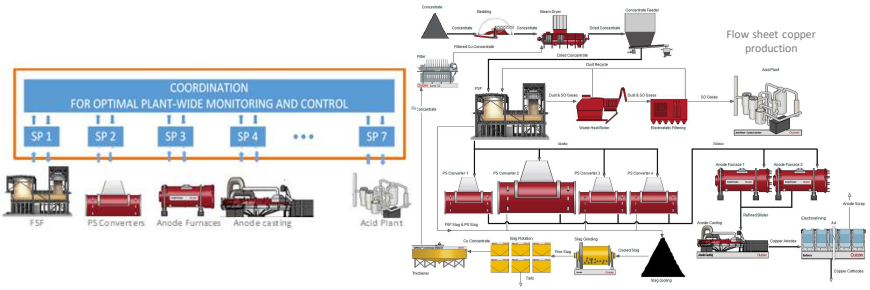
Work Planning



From the 1st October 2016 to 31th March 2020

The Approach

- COCOP concept integrates existing control systems with efficient data management and optimisation methods and provides means to monitor and control large industrial production processes
- COCOP is based on the **decomposition-coordination optimisation of the plant operations:** the overall problem is decomposed into unit-level sub-problems, and then, solutions of sub-problems are coordinated using high-level coordination to plant-wide optimal operation, enabling real-time optimisation of the plant



- COCOP also combines the technological development with a **social innovation process** of co-creation and co-development for improving effectiveness and impact of the innovations and operator acceptance

The Application

On-site application & validation on two pilot cases

Copper pilot case: to optimize scheduling of batch processes and develop advisory tools for main unit operations **to increase production, improve copper recovery and reduce emissions**

Steel pilot case: to develop a steel manufacturing plant-wide monitoring and advisory tool **to reduce the surface and sub-surface defects** in micro-alloyed steels in as-rolled state

Transfer analysis to other two sectors

Chemical sector

Water treatment processing

Impact and Exploitation

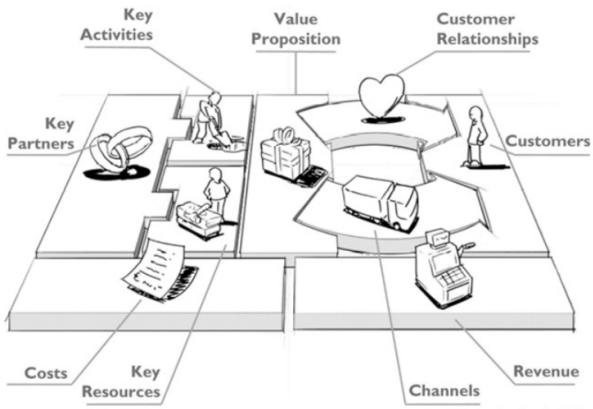
Main Beneficiaries:

- **Process Industry:** COCOP concept can be applied to any industrial production site (steel, copper, chemical, cement, glass, etc) since it relies on general methods such as modelling, data analysis and optimization
- **Automation solution suppliers**

Main Benefits: COCOP solution will allow to **approach optimal production** and:

- **Increased product quality**
- **Reduced** operation **costs**
- Increased **sustainability (reduced energy and resource consumption** and decreased **greenhouse gas emissions)**
- **Improved working conditions** of plant operators by the new process control tools which support the operating work

Increased competitiveness of the European process & automation industry



COCOP involves the business perspective in the research and development work with the help of the Business Model Canvas framework as introduced by Österwalder

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