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SPIRE Workshop

Brussels, Italy, October 1st 2018

www.ibd-project.eu

H2020 – SPIRE-08-2015
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Contents

1. IbD Project ID

Months

36

Sept 2015 - Aug 2018

Budget

10 M€

SPIRE-08-2015

Partners

22

Countries

8

IbD Main Objective: To create a holistic platform for facilitating process intensification in processes in which solids are an intrinsic part (tailored chemicals, pharmaceuticals, minerals, ceramics).

2. Process Intensification in Industry

Noteworthy features

· Plant size and/or cost reduction.
· Energy saving/CO_2 reduction.
· Waste reduction by more uniform processing.
· Safety (reduced inventories).

· More rapid production.
· Batch to continuous production.
· Distributed manufacture.

BUT:

· PI is regarded as ideal for liquids/gases.
· Potential users are put off if they are handling solids.

·Blockage and fouling are major concerns (e.g. heat exchanger passages, pharma plant particle retention).

2. Process Intensification in Industry

Industry Needs:

- **Confidence** that PI equipment will handle streams containing solid particles
- Adequate **design procedures** for such equipment exists.
- **'Someone has done it already'**– overcoming "The rush to be second!"
- The PI unit operation can be **integrated** into their existing plant.
- Factors such as **control and data-handling** are up to the demands of PI plant

2. Process Intensification in Industry

IbD Project Provides:

- Case Studies that demonstrate how PI problems where solids are handled can be addressed and overcome.
- A wealth of accessible publications backing up the procedures in the Platform.
- A readily-accessible Platform to aid PI equipment selection and design in situations where solids are present, which includes:
  - A comprehensive database of PI equipment (Knowledge-Based Engineering, KBE)
  - Built-in modules with design equations for relevant existing and novel PI technologies
  - Advice on minimising fouling/blockage
  - Control and PAT selection control strategies and techs.
  - Life cycle analysis/costing analysis tools
  - TRIZ

3. IbD Case Studies

- Metallic Powder Processing (Classification)

- Ceramic Powder Processing (Mixing)

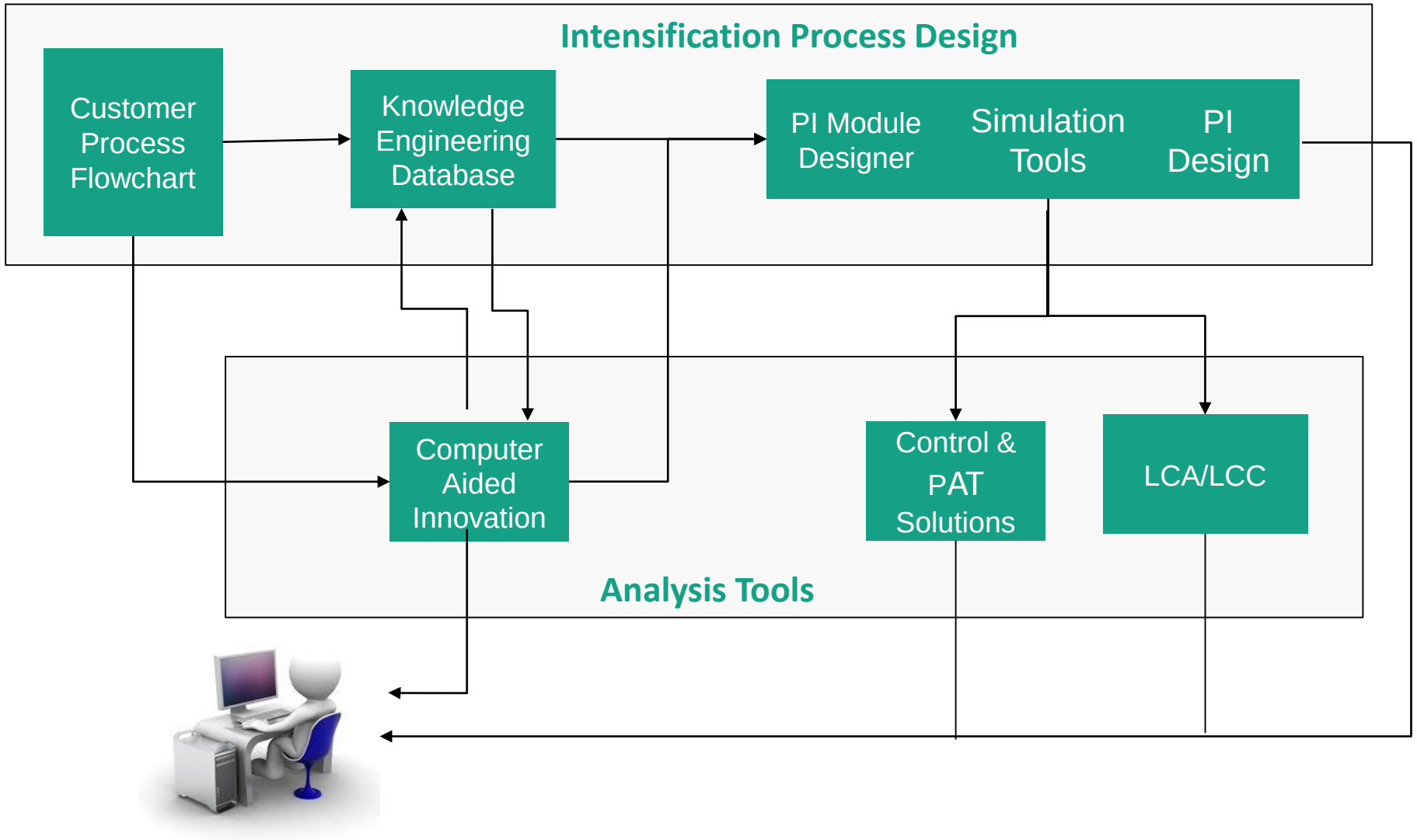
- Mineral Beneficiation (Flotation)

- Pharmaceutical Processing I (Granulation)

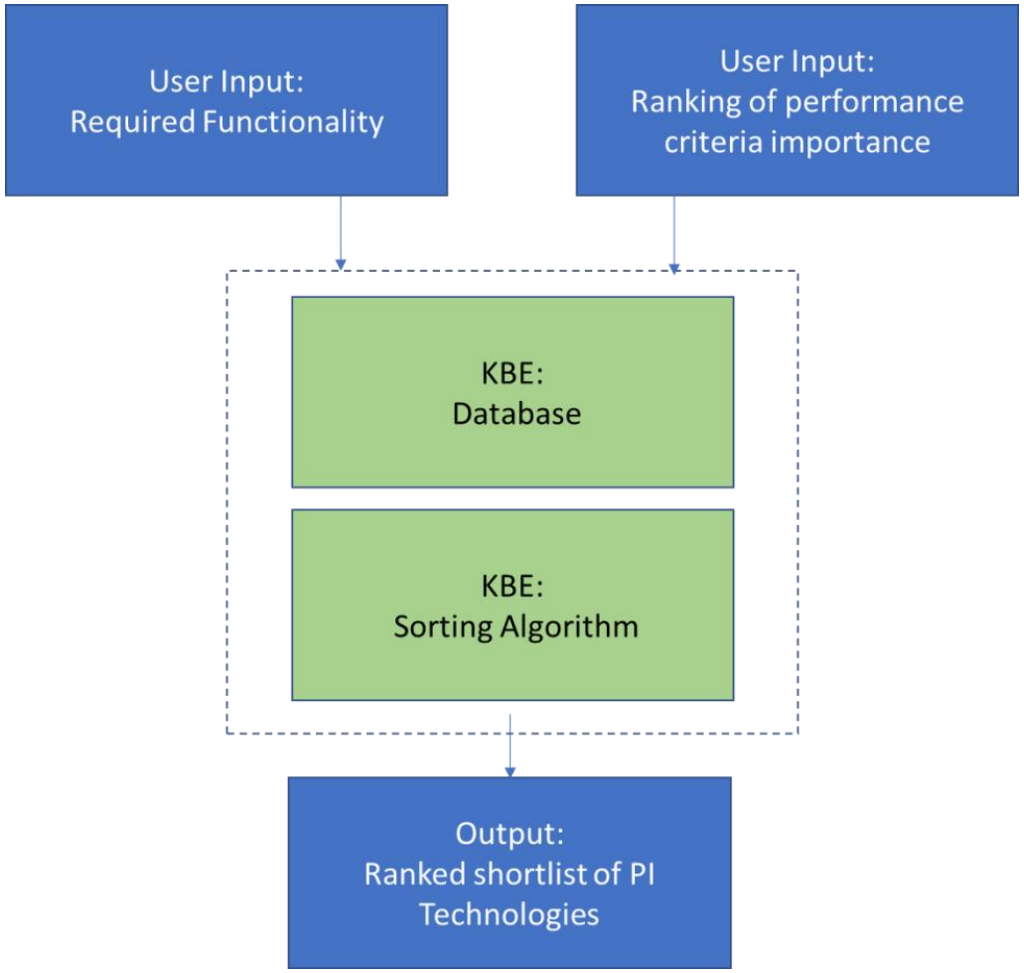
- Pharmaceutical Processing II (Drying)

- Chemicals with Solid Reagents (Reaction)

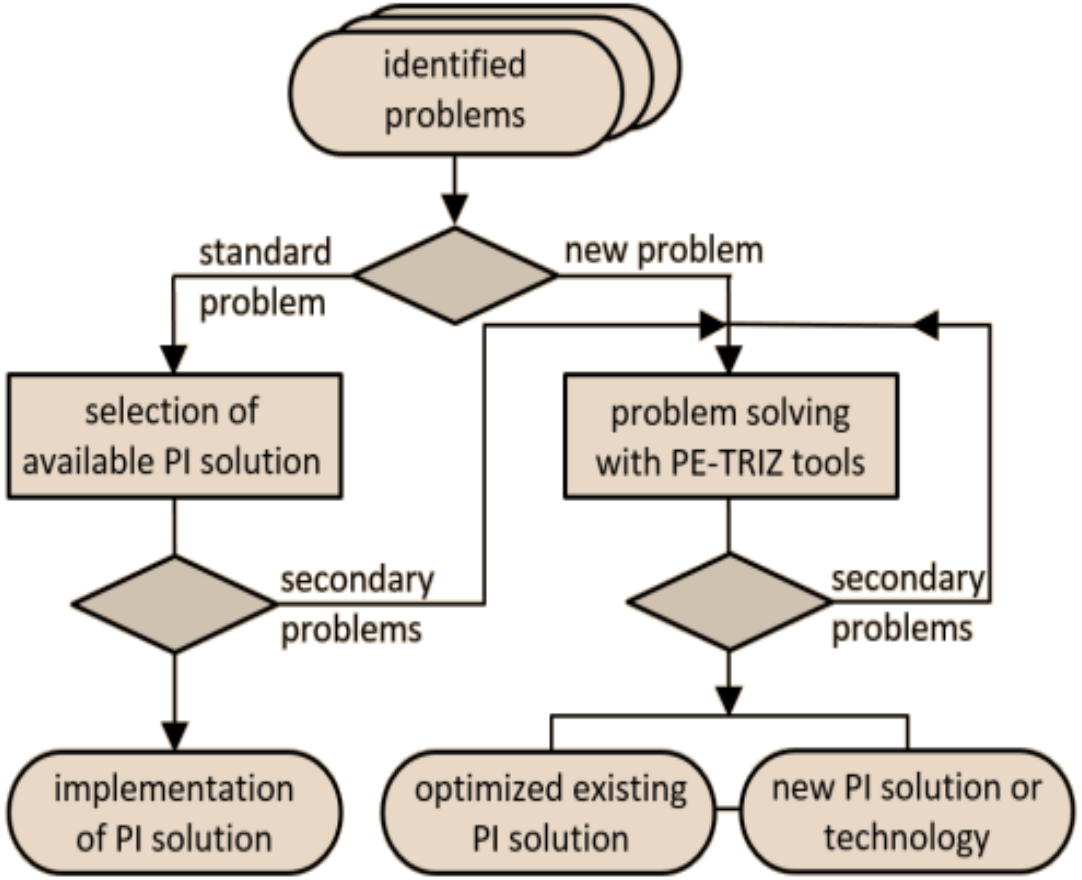
4. IbD Tools


Intensification Process Design
Customer Process Flowchart
Knowledge Engineering Database
PI Module Designer
Simulation Tools
PI Design
Computer Aided Innovation
Control & PAT Solutions
LCA/LCC
Analysis Tools

Knowledge-Based Engineering (KBE)



Computer Aided Innovation – TRIZ (Theory of Inventive Problem Solving)



Life Cycle Analysis (LCA)/Life Cycle Costing (LCC) Estimation Tool

User friendly	Questionnaires Default information.
Allow simplified online calculation	Internal formula / characterisation factors. Generic representative data
Allow gathering data for complete LCA	Function export/import LCA to be performed externally

Conventional process

- -Data collection
- -LCA – LCC performance
- -Hotspots detection

Intensified process

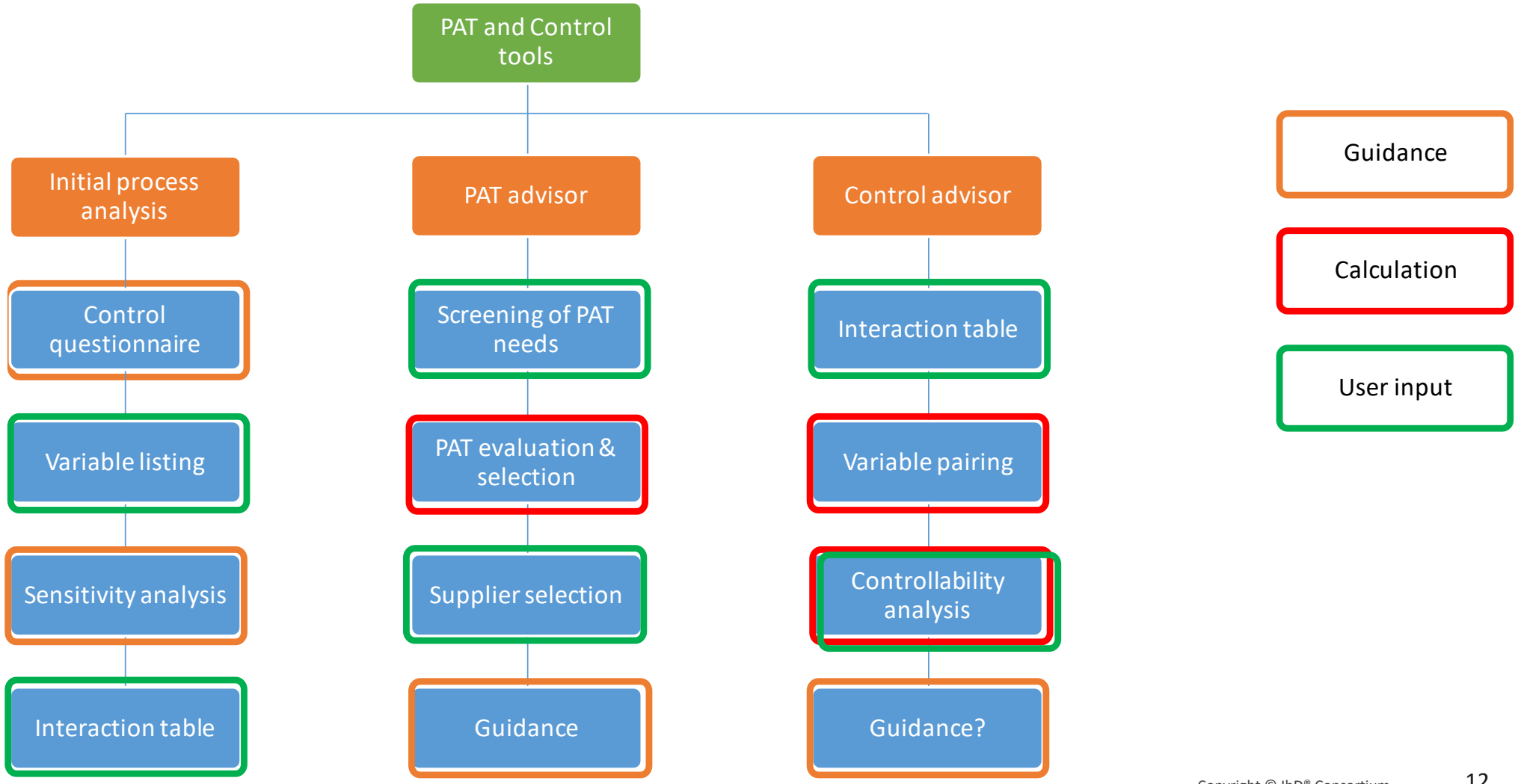
- -Data collection
- -LCA – LCC performance
- -Impacts comparison

Final report

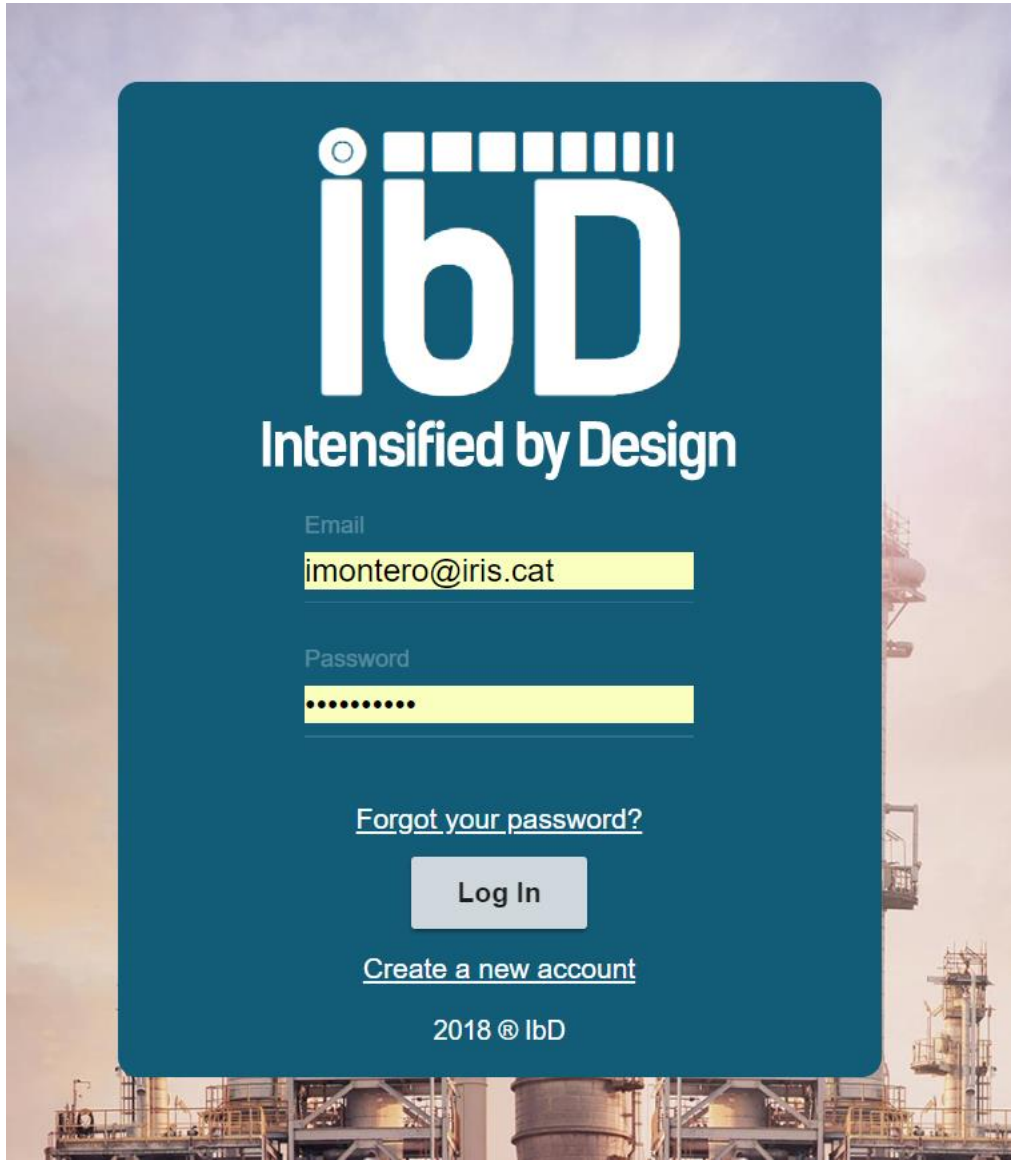
Results defined by process phase:

- Equipment
- Raw materials
- Operation
- Maintenance

PAT and Control Solutions for Process Intensification



4. IbD Platform



- IbD Platform Freemium Version is completed
- Available in: https://ibd.iris.cat/
- Launch Week 40
- OEMs & RTOs will add their PI and PAT techs into the e-platform.
- Users will design a PI solution, find the provider and/or purchase further detailed analyses.
- High potential in academia as standardisation tool in PI research and as advanced educational tool.

Thank you for listening.

Partners

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