DIGITAL TWIN INTERNAL LOGISTICS
AI AND ROBOTS TO SUPPORT OPERATORS

To allow dynamic management of internal logistics, the plant manager receives proposals for solutions and relevant decision-making aids to anticipate risks in crisis management and improve productivity.

SIMULATE
OPTIMISE
SUPPORT

ALTEN end-to-end support tailored to the business context

Simulate
- Scheduling
- Logistic flows
- Operators flows
- Tool and AGVs flows
- Factory control tower (performance measurement)

Optimise
- Real time flow supervision
- Automation of simulations (past, present and future)
- Supervised simulation using artificial intelligence and distributed Multi-Robot Task Allocation algorithms
- Optimisation research to find the best solutions for task allocation between human and machines
- Prescription of added-value logistics scenarios

Support the optimisation of internal logistics flows and the crisis management

- The plant manager receives analysis to understand and decide:
  - The plant performance and risks
  - The current crisis (if applicable), and the causes of failures
  - Possible measures and associated gains
- Operators and robots receive instructions to implement the new strategy selected by the pilot
- Effectiveness of prescriptions is measured, and the system learns from its experiences (Reinforcement Learning)
- Operators are guided in augmented reality to be trained or to carry out work instructions

ALTEN supports its customers' development strategies in the areas of innovation, R&D and technological information systems. Created more than 30 years ago, the Group has established itself as a world leader in Engineering and IT Services. Based in 30 countries, **ALTEN** currently has more than 54,100 employees all over the world.

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ALTEN SUPPORT FOR THE IMPLEMENTATION OF THE DIGITAL TWIN

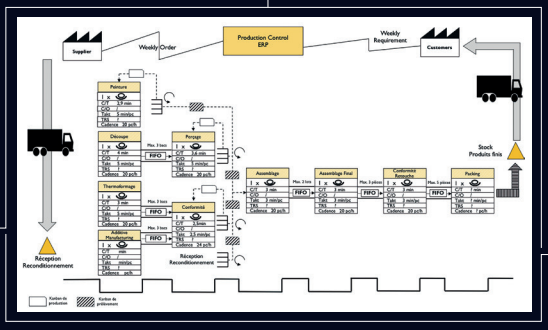
AUDIT
- Situation analysis
- Needs definition

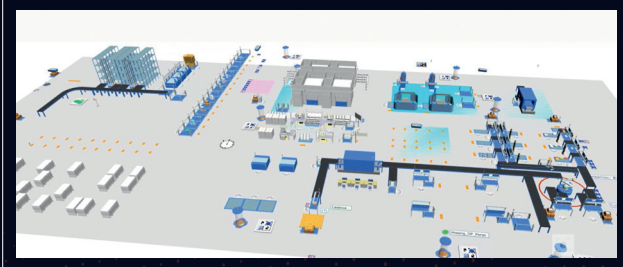
MODELLING
- As is
- Siemens tooling environment

ANALYSIS & SIMULATION
- Performance analysis
- Simulation of different cases (past, future or degraded)

OPTIMISATION
- Logistics flows
- Tools and AGVs flows
- Operators flows
- IT/OT connection

IMPLEMENTATION
- In the real factory
- With indicators and a cockpit/ plant control room





TO GO FURTHER
Multi-Robot Task Allocation (MRTA)

MRTA is the problem of optimally assigning a set of tasks to a set of robots, given certain constraints.

Our approach aims at optimising the performance of the fleet and the production system by taking into account:

- The centralised or distributed aspect (embedded in each of the robots) of these calculations
- The heterogeneous aspect of the fleet of robots, which may be of different brands and capacities of action
- The complex aspect of the tasks to be performed (scheduling of simple tasks with more complex tasks incorporating the robot/human cooperative dimension)

LEARN MORE

HUMAN AT THE HEART OF FACTORY 4.0

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