Optimizio
AN ASSYSTEM SOLUTION

SOLUTION SHEET

Optimizio*

A solution for optimising and increasing the reliability of complex plannings, making it possible to manage resources and constraints effectively and to support decision making

USE CASES

Engineering sequences

Construction or dismantling of complex installations

Unit shutdowns

Maintenance management (CMMS)

Industrial asset management

PROJECT BENEFITS

Reduction of inconsistencies or conflicts between tasks

Flexibility and simplicity of analysis when input data changes

Improved data visibility with the integration of KPIs (graphs showing milestone deadlines, scalable Gantt planning, etc.)

Decision support for planning and contingency management

CONTEXT & STAKES

Managing complex industrial infrastructures from construction to dismantling, including maintenance and operation, requires precise planning of works and activities, while coordinating the intervention of numerous actors and stakeholders in the project, with the use of resources that are often constrained (materials, time, budget, etc).

These complex projects can involve hundreds or even thousands of activities and interfaces to be managed, generating uncertainties in terms of planning, cost and quality of execution.

The major challenge is therefore to achieve the best possible planning and to control it while remaining agile regarding the uncertainties of any complex project.

THE SOLUTION

Depending on the issues and the complexity of the client's activities, Assystem's solution is available in two forms:

Optimizio*, a scheduling optimisation solution based on the latest AI technology. This solution is adapted to schedules:

• With a high level of complexity (up to 20,000 planning tasks, and 12 to 14 constraints)

• With a high level of recurrence (more than 10 schedules to make per year)

An offer to support the deployment of simulation and optimisation tools for existing schedules. This offer is aimed at complex schedules**:**

• With several thousand to ten thousand tasks

• With numerous constraints (co-activity issues, availability of limited or critical resources, availability of equipment, time constraints or template durations)

• With medium to high recurrence (several times a year, more than 10 schedules a year)

Our tools are flexible and can be easily integrated into existing IS environments.

OBJECTIVES

OPTIMISE the total duration of projects and thus reduce project deadlines

ADAPT to a wide variety of constraints

ENABLE dynamic planning that adapts to uncertainties once the project has started

PROVIDE relevant decision support tools

MANAGE complex project schedules with a large number of actors and activities

** Optimizio is an Assystem solution*

CHARACTERISTICS OF THE SOLUTION

Optimizio*

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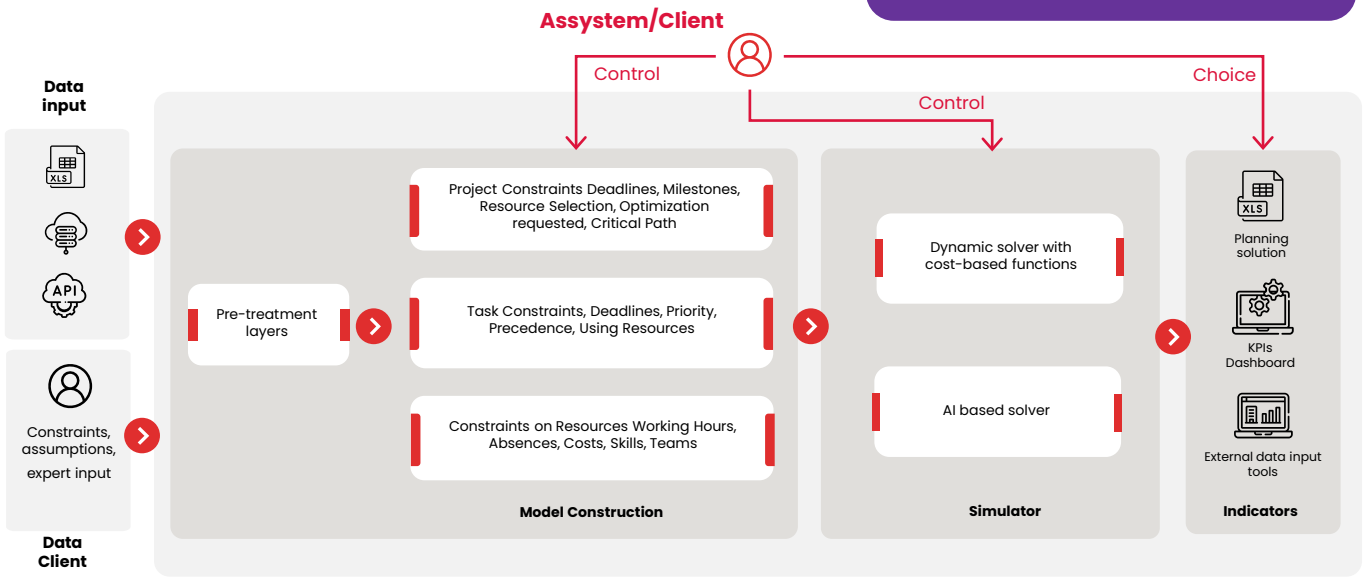
- Simulation of schedules from various input data structures (excel files, databases, XML files) and use of the best optimisation methods (metaheuristics, Artificial Intelligence). These solutions are developed in the Python programming language.
- Integration of various modular methods (metaheuristics, Monte Carlo, Genetic Algorithm) integrating Artificial Intelligence to take into account all the possible constraints of a project and their consequences and which adapts to potential unexpected events by rescheduling the tasks.
- Flexible customisation of the tool in terms of settings for each type of project, as well as client-specific rules and constraints.

TECHNICAL CHARACTERISTICS

- Operating system: Windows, Linux/Docker
- User platform: Web
- Deployment platform: On premise, Azure, AWS

PERFORMANCE

- Less than 5 minutes simulation time
- Flexibility and adaptation of the tool to specific client constraints
- Integration into standard business tools



CASE STUDY

Reliability of "unit outages"

Financial gains by optimising planning.

Decision support by anticipating and managing activities

The project concerns the reduction of the total duration of unit outage planning in a nuclear power plant.

Context. The maintenance of a nuclear power plant is highly complex, involving a very large number of tasks to be carried out, coactivity to be taken into account and safety, security and resource availability constraints. This high level of complexity can lead to difficulties in planning these activities and to delays in carrying out unit outages.

Solution. Assystem is supporting the client to implement a planning optimisation solution for unit outages. The solution carries out planning simulations taking into account all the constraints of the projects: water levels in the tank and the inner basin, state of the installation (reactor), installation conditions (ventilation, door opening, etc.), and management of the packaging space. It optimises the number of maintenance tasks that can be carried out simultaneously, taking into account the resources and precedence relations between the tasks (up to 15,000 optimised tasks).

Client benefits. Financial gains by optimising planning - Better visibility on project planning - Anticipation of activities using predictions - Better monitoring of project progress and decision support.

business@assystem.com

www.assystem.com

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