SOLIDEO

Paris 2024 Olympic Games

Project Management Office Implementation REX

Your Company Logo

Project Controls EXPO London, UK

About Me

I’m Consulting Director at Assystem.

+17 years experience in complex project management & digital transformation on Capital Projects.

I’m also the Technical Director of the PMO team on the SOLIDEO mission.

Habib Benhassine

Consulting Director Assystem

assystem

ECP

Project Controls EXPO London, UK

ASSYTEM : ENGINEERING, ENERGY & DIGITAL TRANSFORMATION

Assystem assists governments, owners, contractors and OEM to develop, deliver and operate critical and complex infrastructures mainly in Nuclear, Healthcare, Life Sciences, Transportation and Defence.

Assystem believes sustainable growth requires an energy mix favouring carbon free electricity. Nuclear power is the main reliable mid-term solution.

PROJECT MANAGEMENT & ENGINEERING

- Project Management
- Design
- System engineering
- Industrial control systems
- Siting & Permitting
- Consulting

COMPLIANCE, SAFETY & SECURITY

- Compliance
- Safety
- Security

DIGITAL & DATA

- Digital transformation
- Digital solutions

€ 500m*
revenue

More than
7,000*
employees

2nd
nuclear engineering company in the world

*Figures as of 30 June 2020

ECP : PROJECT MANAGEMENT EXPERTISE

Expert in Project Management, **ECP provides Consulting, Support, Implementation, Training, Change management, Expertise around PPM solutions** for a wide array of complex projects in France and International.

With 600 consultants, a sustained growth and a diversified sector positioning, ECP established itself as a leader in providing expertise in project management.

600p

A large and qualified workforce (80% engineers)

+50M€

A sustained growth, with a solid financial foundation

n°1

Leader on PMIS implementation services in France ***(Project Management Information Systems)***

SOLIDEO PROJECT #PARIS2024

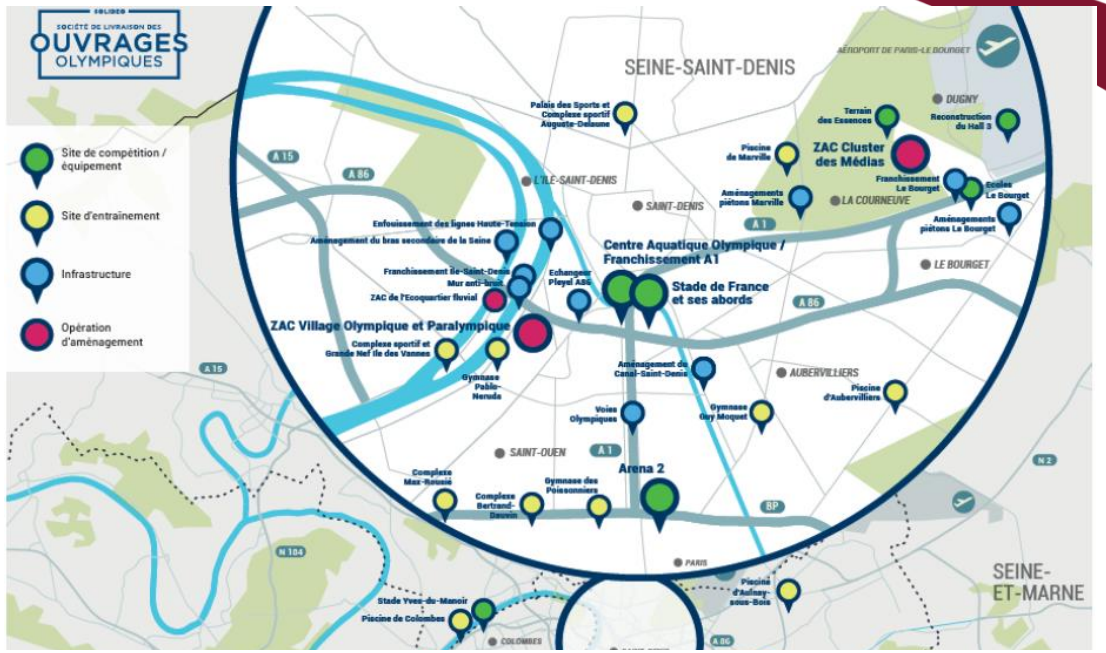
LARGE SCALE URBAN PROGRAM WITH HIGH STAKES

SOLIDEO is the **Olympic delivery authority for Paris 2024 Olympic Games**

SOLIDEO's mission is to **ensure the delivery of venues and infrastructures and the completion of redevelopment operations necessary for the Paris 2024 Games within the defined budget** and to create an ambitious, sustainable and exemplary heritage.

These **venues and infrastructures are conceived and designed to be converted from 2025 onwards into facilities, housing and offices**.

- **Raise** all public funds for financing the Olympic venues and infrastructures investment
- **Support** the public and private project managers in order to guarantee the project delivery within the plan, costs, deadlines, and also achieving ambitions
- **Overall project manager** for the Olympic and Paralympic Village urban development zone, the Media Cluster urban development zone and for other different infrastructures and facilities.



62
INFRASTRUCTURES

29
PROJECT MANAGERS

95 %
OF EXISTING INFRASTRUCTURES

2025
NEW NEIGHBOURHOODS FOR ALL

3.2 billion euros budget

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OLYMPIC VILLAGE KEY FIGURES

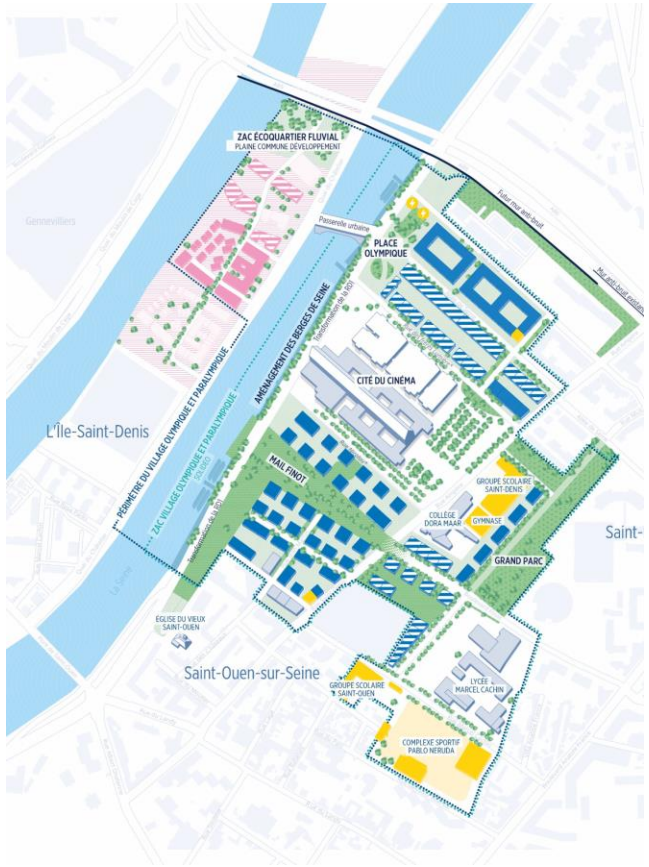
Located less than 5 minutes from the Stade de France, the Village is designed to facilitate the reception and travel of the athletes.
It will accommodate around 14,000 athletes and accompanying staff and families.

Saint-Ouen-sur-Seine and Saint-Denis

- 1,715 housing units
- 750 specific housing units
- 2 school groups and a new gymnasium
- Rehabilitation & extension of existing gymnasium
- 1 park of 2.5 ha
- 117,000 m² of business, offices and services
- 2,000 m² of local shops
- 2 nurseries with 30 cribs each

L'Île-Saint-Denis

- 320 family housing units
- 1 student residence with 142 rooms
- 1 urban park of 1.3 ha
- 1 hotel with 115 rooms
- 2 office buildings
- 1,850 m² of shops
- 1 water sports centre of 1,200 m²
- 1 Cité des Arts of 1,500m²



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LARGE SCALE URBAN PROGRAM WITH HIGH STAKES

SOLIDEO has entrusted Assystem with a PMO (Project Management Office) mission, the objective of which is to set up and operate an integrated collaborative project management tool and deploy robust project management processes

The scope of work is particularly complex due to

- The **multiplicity of projects**
- The **multiplicity of project owners**,
  - **internal** (Public Areas and Facilities teams)
  - **external** (promoters and other public project owners)
- The fact that all these project owners must **carry out their work within a very limited geographical scope**

Digital solutions to support Project Management processes & industrialize project monitoring

Centralized PMO in charge
of data integration, analysis & reporting

Scheduling & Risk Management processes
implementation on a monthly basis

Centralized Project Management Database for schedule & risks

Additional tools to **perform simulations & optimizations**

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SOFTWARE SUITE IMPLEMENTATION

- Short schedule for solution setup : 3 months
- **2 months implementation project**
- **1 month validation of the PM process**
- 4 PM Officers dedicated to process
- 4 IT consultants dedicated to implementation

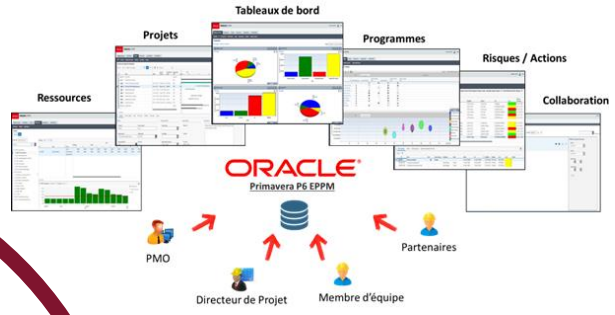
Primavera P6 EPPM Cloud

Program & Project Management

Interface Management

Risk Management

Progress Tracking



ORACLE
BI PUBLISHER

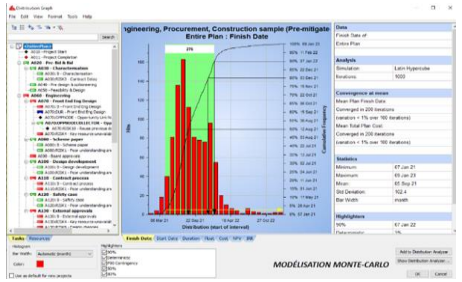
BI Publisher

Automatic Reporting
Powerpoint / Excel

KPIs tracking

Milestone trend analysis

ORACLE
RISK ANALYSIS

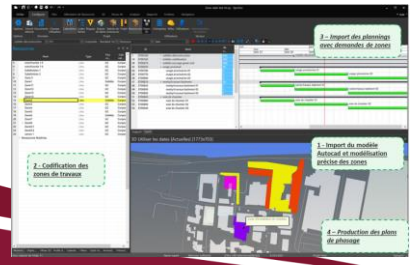


Primavera Risk Analysis

Monte Carlo Simulation

Schedule simulations
with P50 / P80

SYNCHRO 4D



Synchro 4D

Construction Site
Work Areas
clash identification

Phasing books

Optimizio

Construction Site
Work Areas
clashes resolution

Schedule optimization

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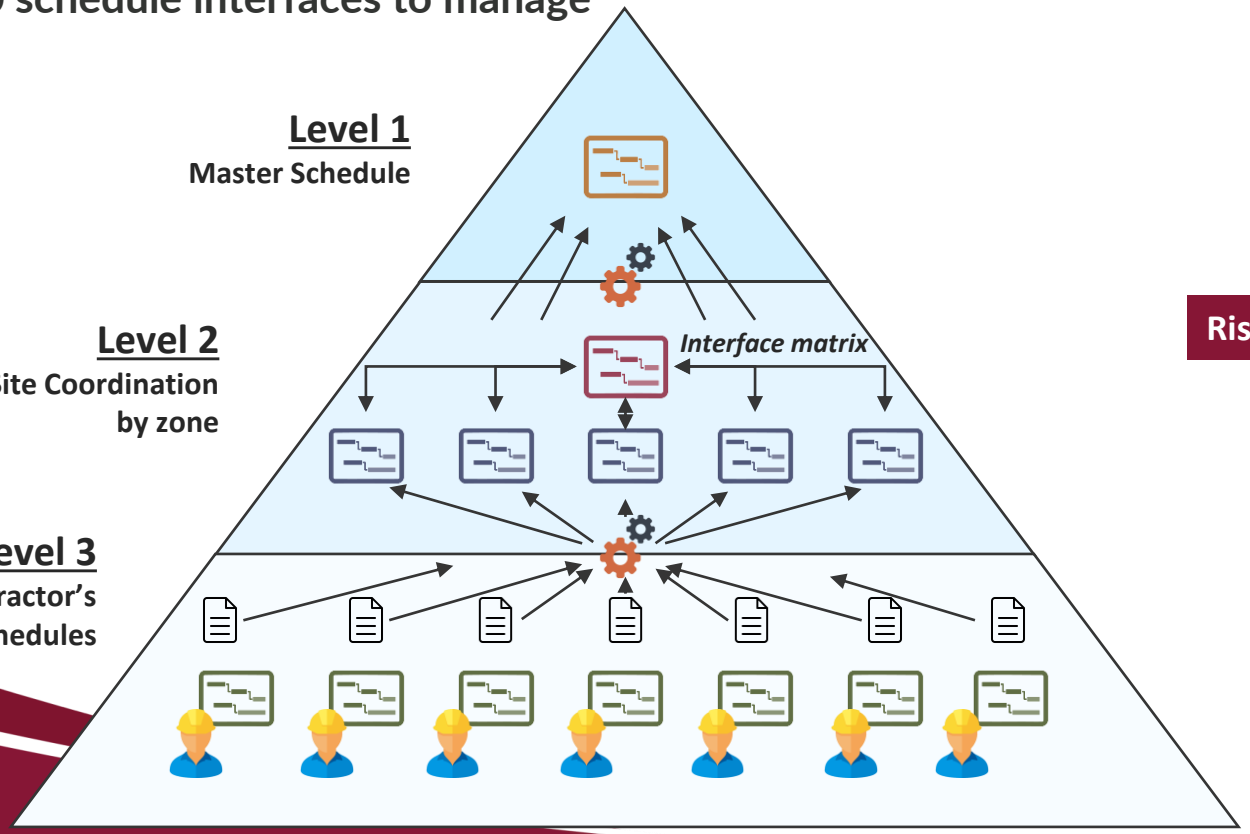
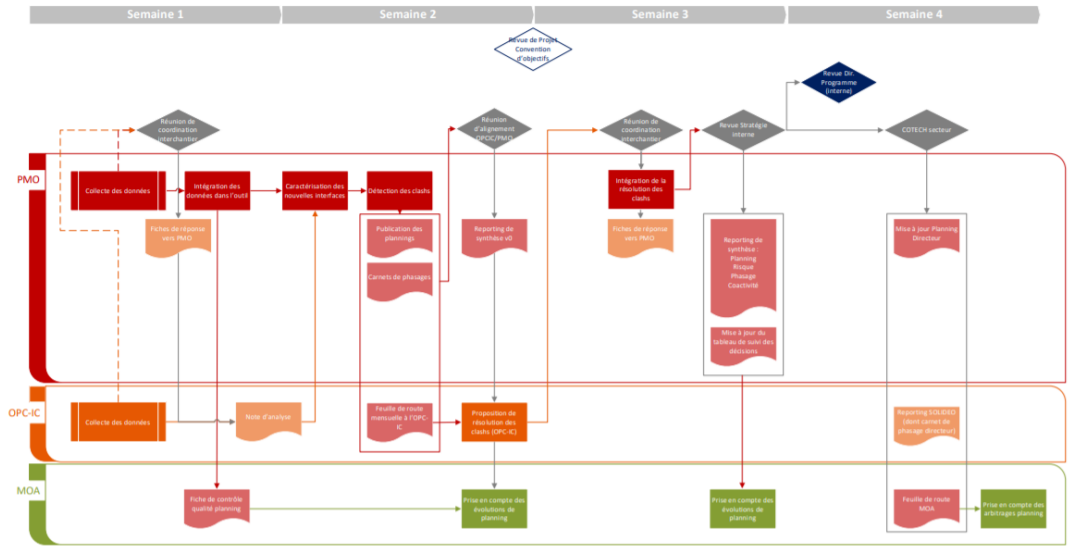
PROJECT & PROGRAM MANAGEMENT

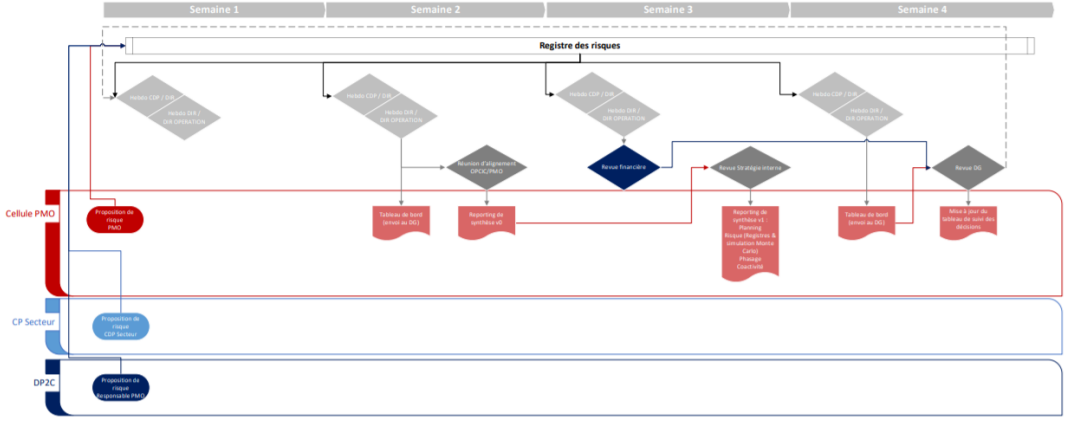
- **PMP definition with Schedule & Risk Management**
- **Data integration, analysis & simulation** on a monthly basis
- **+44 schedules with +10K tasks today,** more to come
- **~400 schedule interfaces to manage**



Schedule integration & clash identification process on a 4 weeks cycle



Risk management process on a 4 weeks cycle



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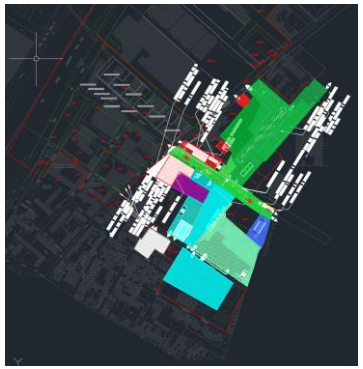
4D SCHEDULING PROCESS IMPLEMENTATION

1 DWG by sector

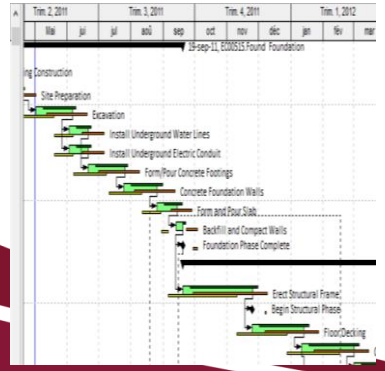


- Work areas are defined in 2D in Autocad with specific naming convention
- Each contractor details its work areas requests

1 DWG file in 2D

PMO team transform the 2D phasing in 3D model with all work areas

Multiple contractor schedules by sector

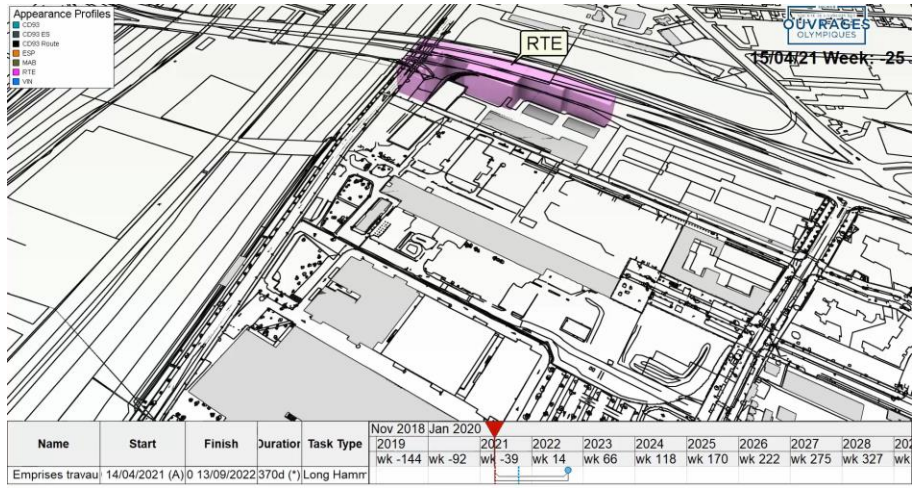


- Schedule inclure work areas requests as material resource assignments
- Work areas are assigned on enveloppe tasks

MS Project Schedule

PMO imports schedule updates with work areas requests

1 4D schedule by sector



- Consolidation of work areas requests
- Spatial coordination analysis and clash detection

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4D SCHEDULING PROCESS IMPLEMENTATION

BIM EP & PMP

Codification of the construction site work areas at sector level

Work areas requests from schedules (P6 ORACLE)

Update constractor's schedules (P6 ORACLE)

Integration of schedule & 3d data

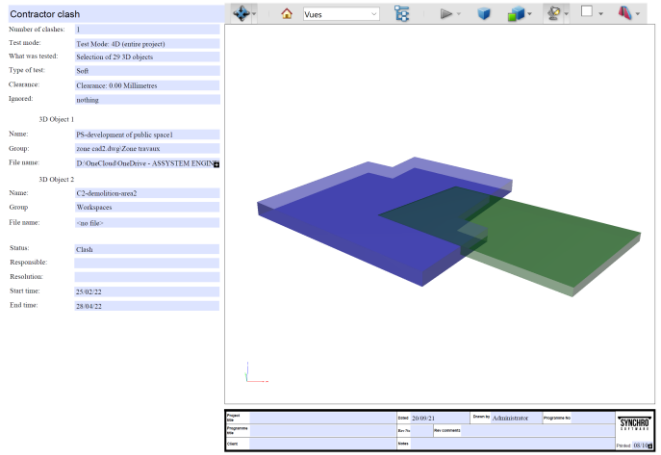
2D to 3D model of each sector work areas (AUTODESK)

Automatic assignment of 3d models to work areas requests in schedules

Identification of all potential work areas interfaces (work areas constraints)

identification of spatial coordination clashes

Co-Activity Clash Report



OPTIMIZIO

Identification of contractor's schedule optimization scenarios

Proposition for updated schedule with new work areas assignment dates

Validation of the resolution

Recommendation on rescheduling of sector operations

Autocad

Primavera P6

Synchro 4D

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SCHEDULE OPTIMIZATION

- The challenge for SOLIDEO is to identify and assess quickly schedule optimization scenarios
- OPTIMIZIO, Assystem's schedule optimization tool, is the solution used to perform this task

OPTIMIZIO

- Ensure alignment with target scheduling process
- Support the PMO team by providing a quick way to identify schedule optimization scenarios

Challenge Input Data

Visualize data : Using a series of indicators, identify input data quality

Inconsistencies : Identify all data inconsistencies that would make impossible the identification of an optimized schedule

Analysis : Analyze the clean data sets

Simulate & Optimize

Quick : Be able to process a large quantity of data quickly without relying on heavy calculation infrastructure

Conflict resolution : Be able to propose optimized schedules without any conflict

Tracking : Identify the root cause of delays and their effects

Post simulation analysis : Recommend schedule optimizations and resource allocation improvement plan

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SCHEDULE OPTIMIZATION

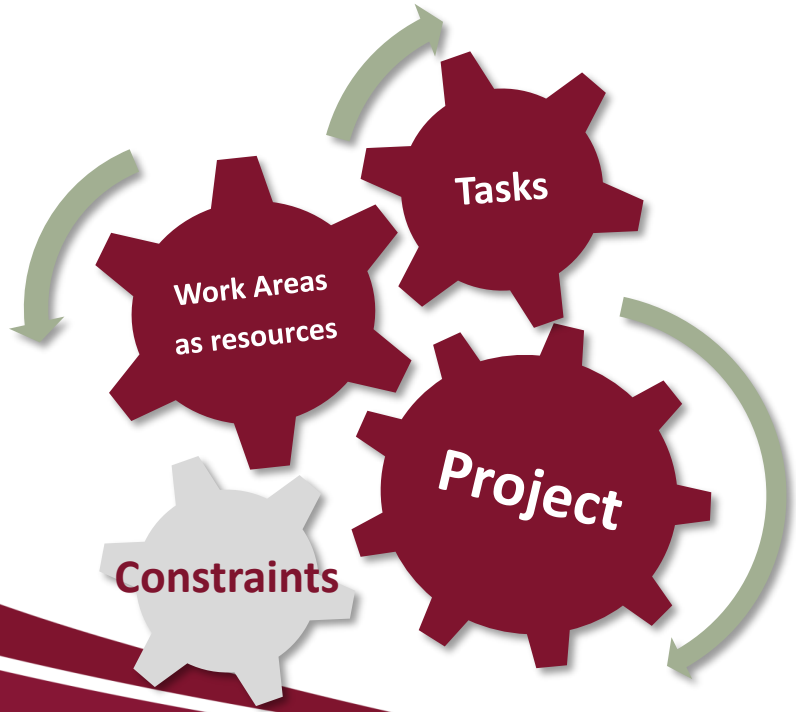
Project Schedule

- Tasks
- Relationships (FS, SS, FF, SF)

+ Site physical constraints

OUR APPROACH :

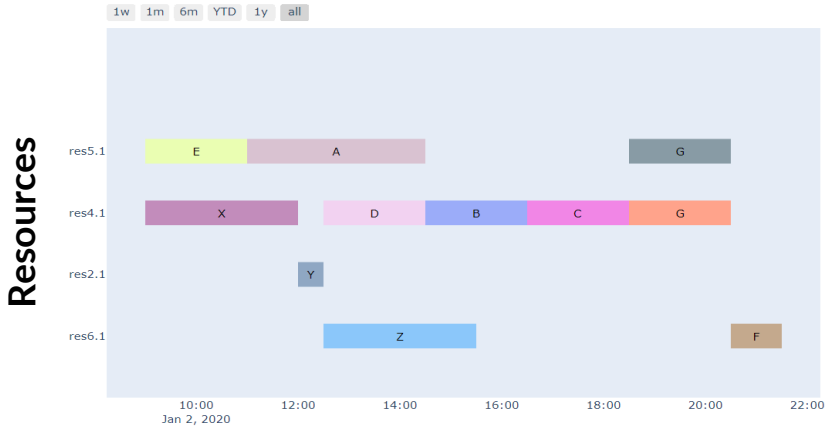
A rule engine using a heuristic (for RCPSP problems) which is flexible in order to adjust to the various constraints but also **precise and fast**



Resource
Constrained
Project
Scheduling
Problem
(RCPSP)

NP-Hard problem:
No optimal solution is possible in a polynomial-time

Schedule



Time

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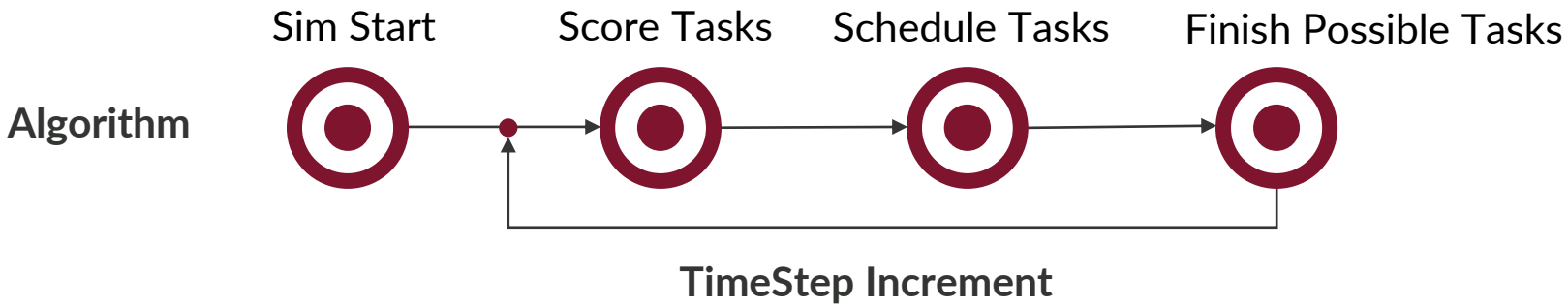
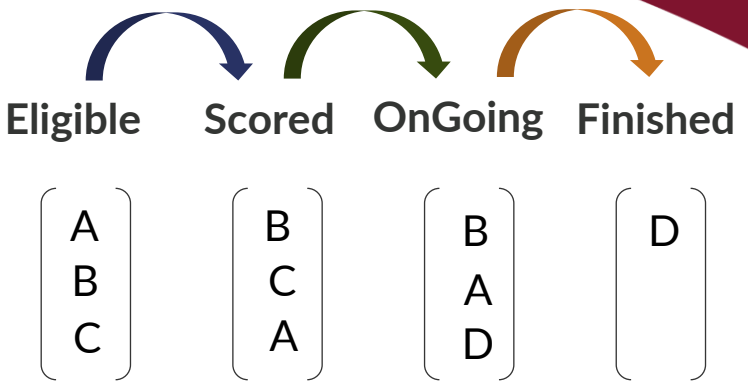
SCHEDULE OPTIMIZATION





Dynamic Task Score = Critical Constraints: **Precedence Satisfaction** + **Workspace Availability** + **Site Constraints** + w_1 User-defined Priority + w_2 Positive or Negative margin to task deadline + w_3 Positive or Negative margin to Project or Milestone deadline

Main challenge met during implementation :

- *Schedule quality : support negative lags for project optimization (soft contraints)*
- *Optimization of work areas allocation on **enveloppe tasks***

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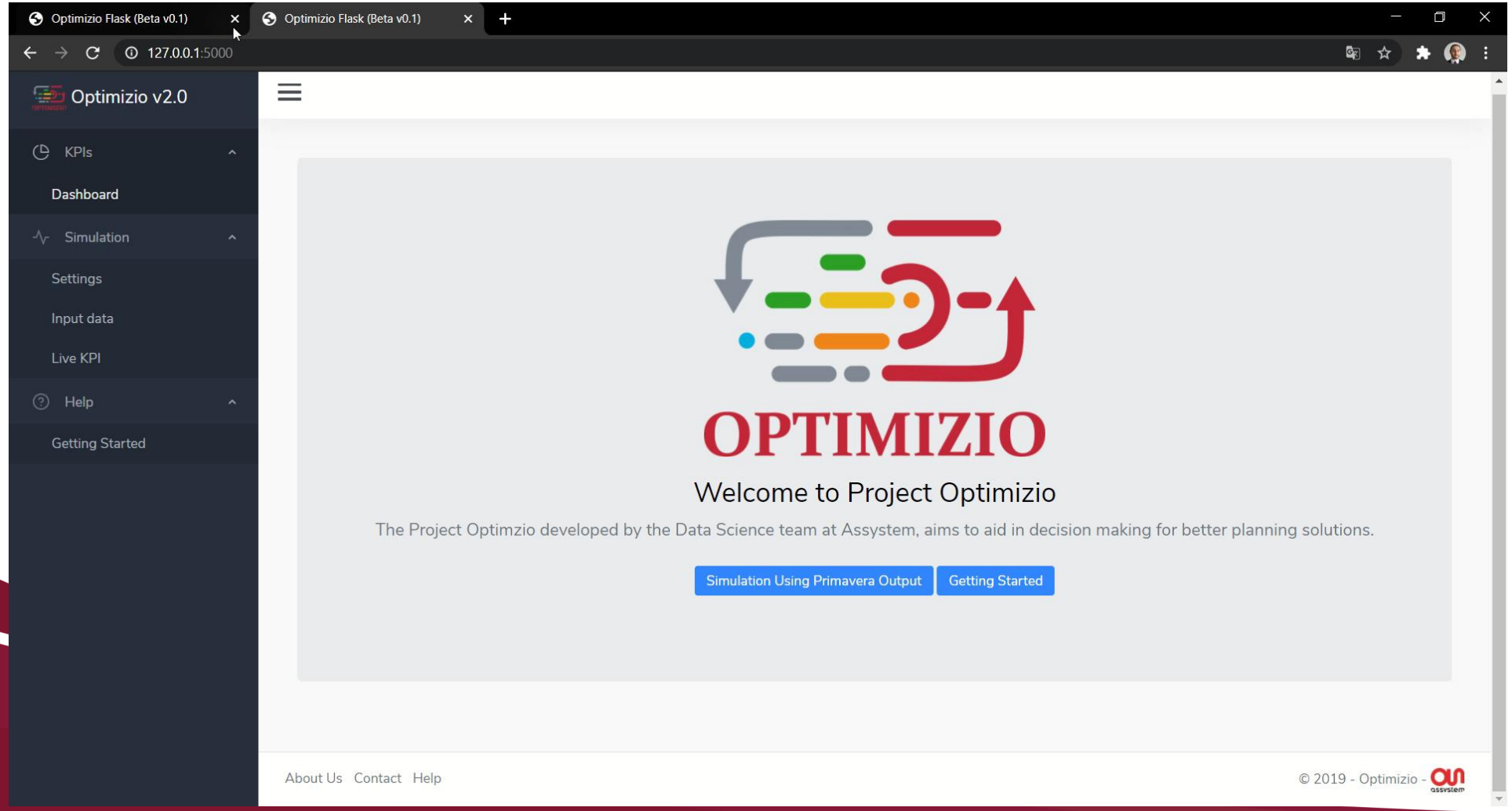
SCHEDULE OPTIMIZATION PROCESS



1. **Import schedules from Primavera P6**
2. **Import data with site works areas physical constraints**
3. **Simulation laucnh**
4. **Assess results in Synchro & P6**

Benefits :

- Quick customization of complex business rules (excel based model)
- Quick simulation < 5 min for +2K taks
- Integration with P6 & Synchro

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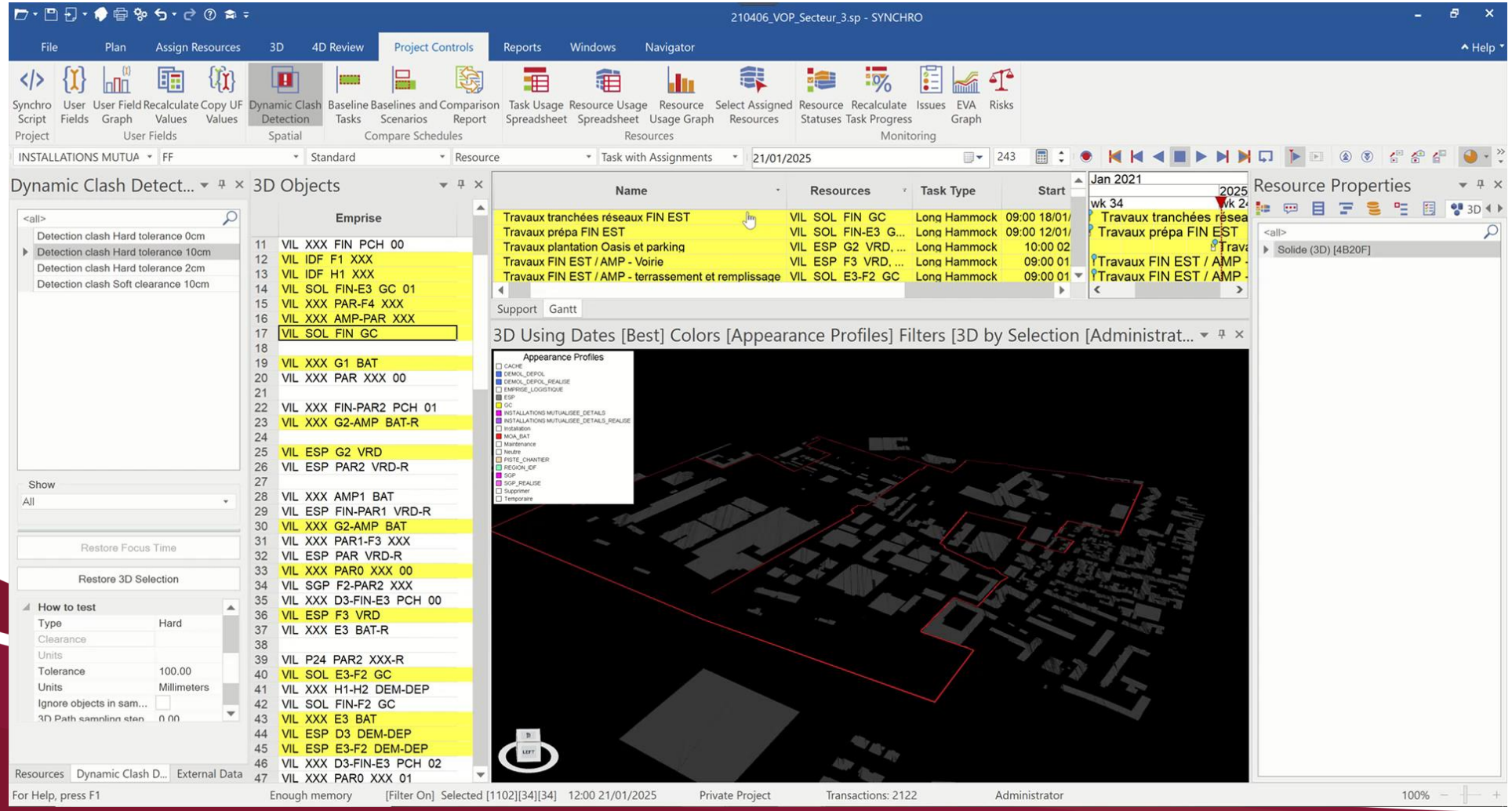
SCHEDULE OPTIMIZATION PROCESS



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CONCLUSION

Start of PMO in Jan 2021 with a quick implementation approach (3 months) to set up tools & processes & be able to build a robust critical path of the complete program

Interfaces modelling using a milestones matrix to manage the schedules dependencies

- *Definition of a schedule clutch mechanism*
- *200 interfaces to manage today and up to 400 interfaces in total*

Rigourous approach with significant cultural shift, from SOLIDEO to contractors and EPC teams

- *Moving from project schedules using Excel & MS Project to Project Management Information System in the Cloud*
- *Moving from Static 2D phasing books to schedules with work areas requests and 4D scheduling*

Challenge to improve overall input data quality from the project managers and contractors,

- *Concise scheduling specifications & requirements post contractual phase*
- *Continuous improvment approach (KPIs to measure schedule quality)*

First results following implementation :

- *Monte-carlo reports*
- *Automated xls & ppt reporting*
- *Identification of clashes in 4D*
- *First simulations using Optimizio*

Q & A

THANK YOU

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