Leveraging the Digital Revolution for Industrial Performance

A Step Change for A320 Nose Section

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Aircraft Architecture & Integration
September 2019

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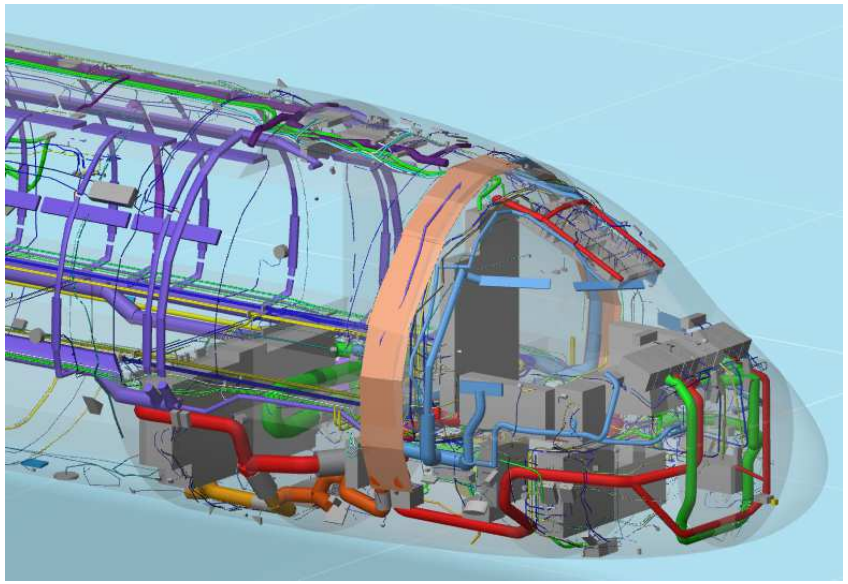
1- The Challenge

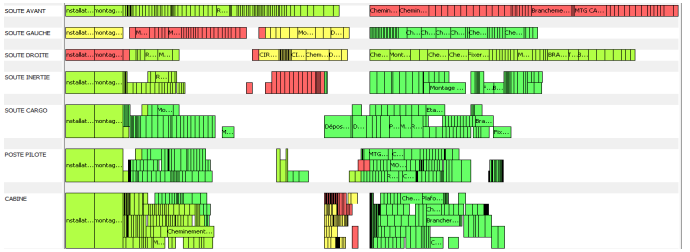
Further improve **Industrial Performance** with existing **Industrial Means**



Identifying **aircraft evolutions**
improving **fit for assembly**

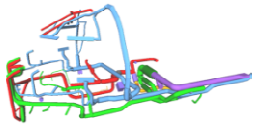
Optimising Industrial Process

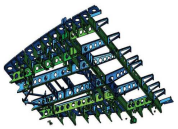
2- The Global Approach

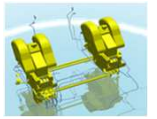


Digitalisation and Modelling

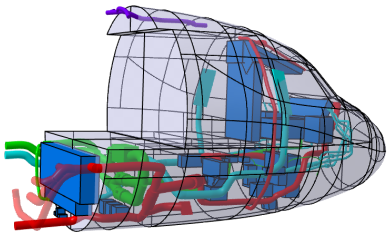
- Assembly Workflow Optimisation
- Bottle Necks Identification

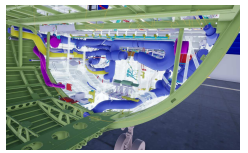






Aircraft Evolutions Design





Fit for Assembly Criteria Definition

Fit for Assembly Assessment

3 – Digitalisation and Modelling

Data Model creation

Routing
Digitalisation

SAP extraction

500 routings
2000 tasks

Manufacturing Technical Constraints definition

Operation **duration** distribution at routing level

PERT Microsoft Project

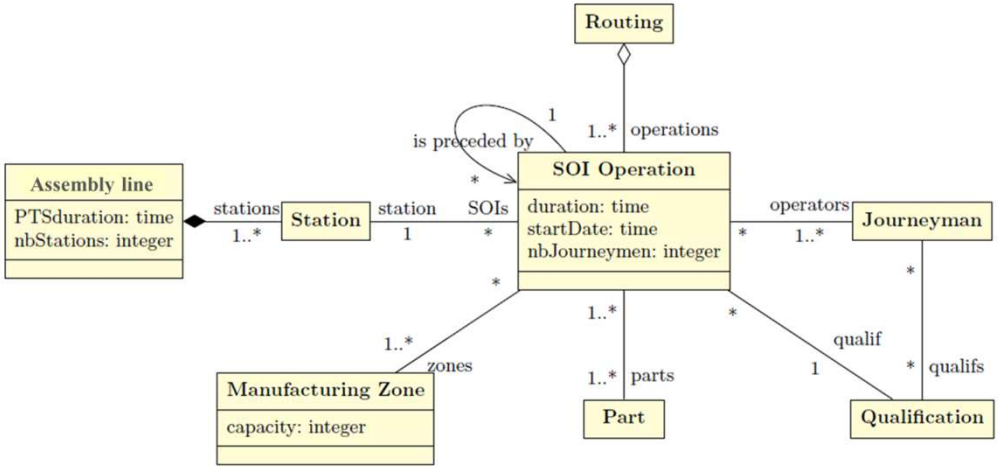
200 Technical Constraints

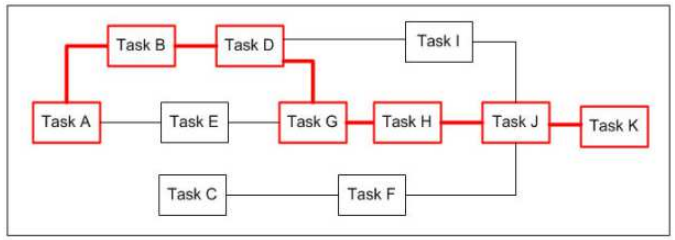
Operation sequence Modelling

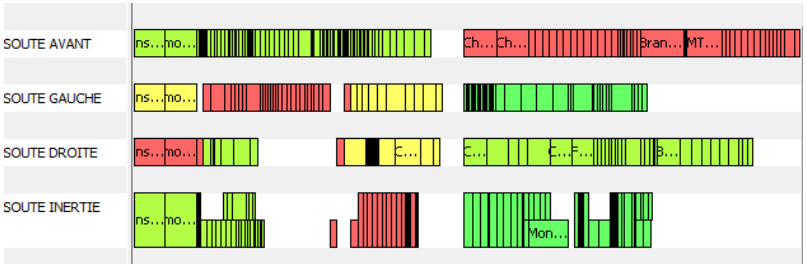
Incell modeler

ONERA
THE FRENCH AEROSPACE LAB

InCell
RCSP optimisation library







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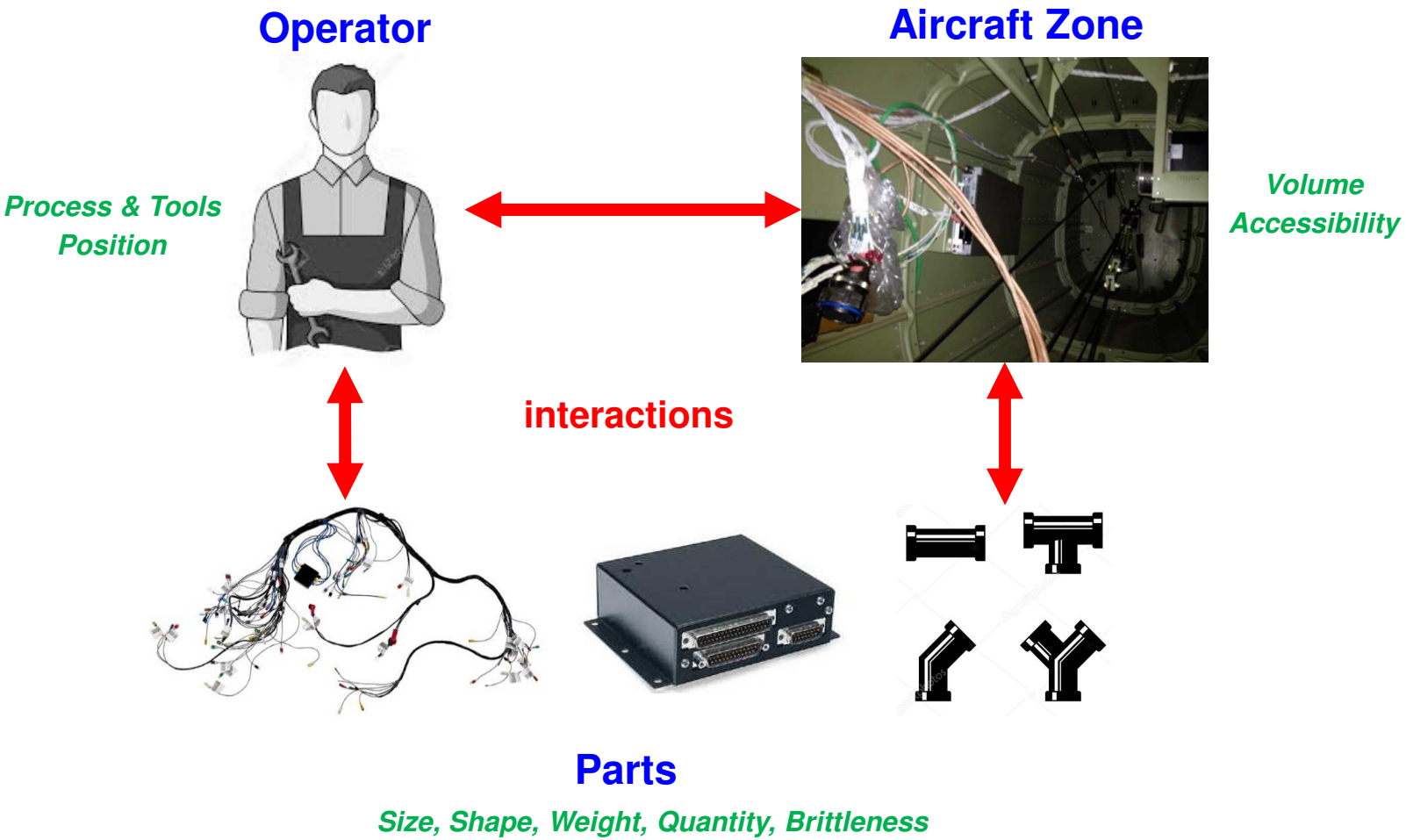
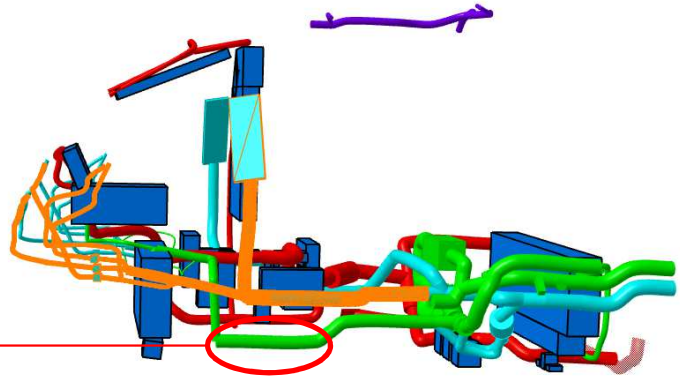
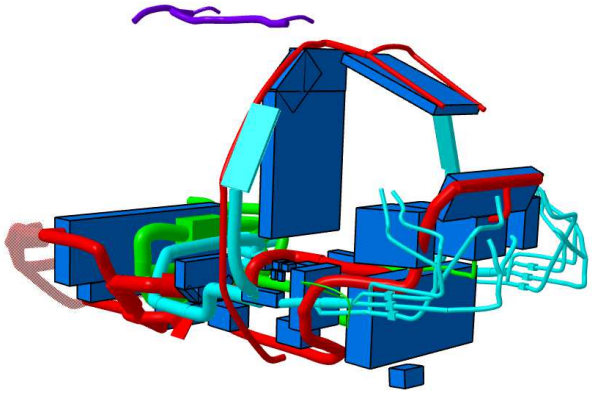
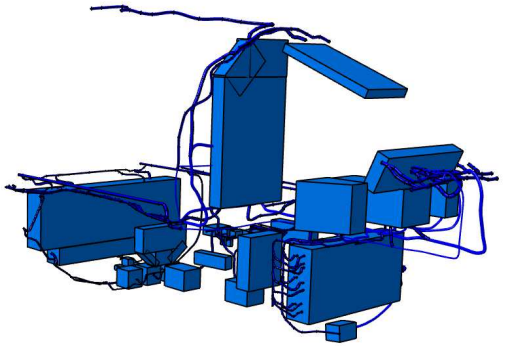
4- Fit for Assembly Assessment



4- Fit for Assembly Assessment





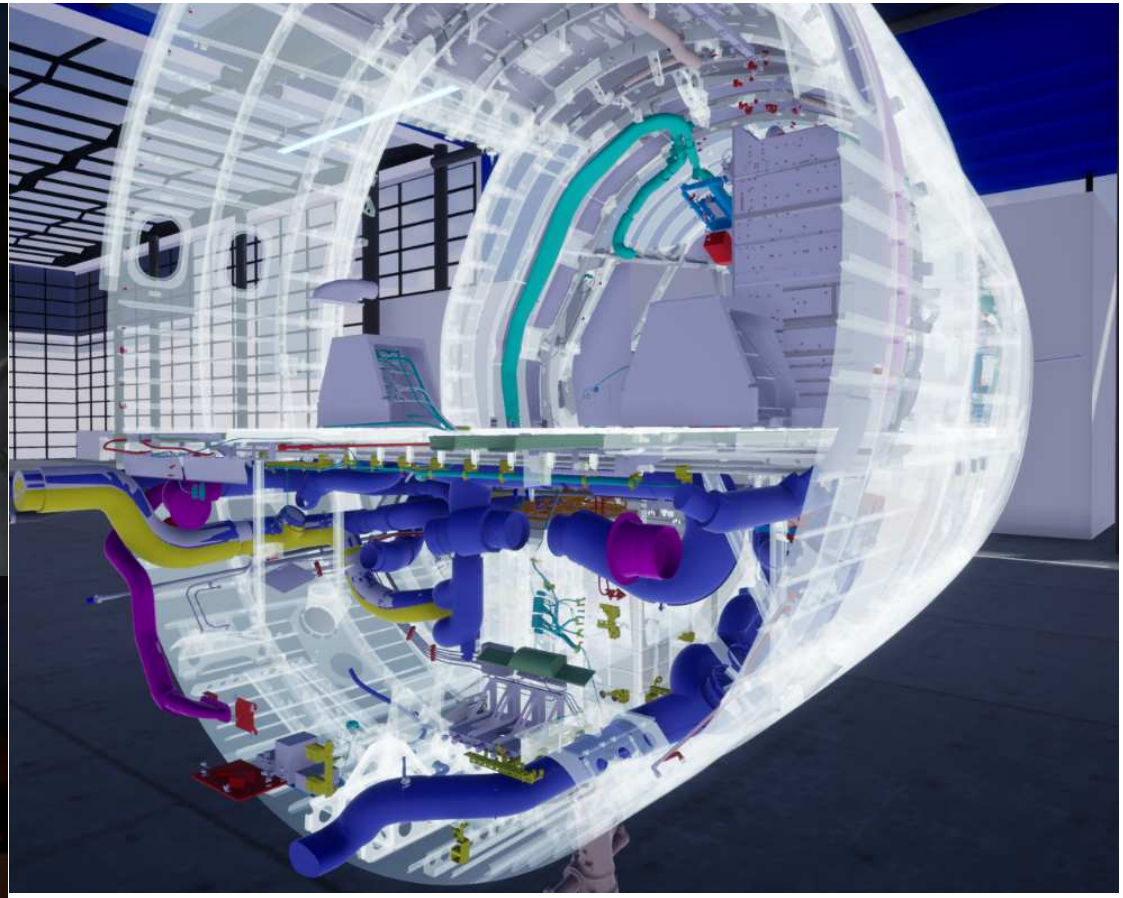


Interface				Ergonomics				Assembly		Component	
Part	Type	Module IN	Module OUT	Working Area	Zone	Access	Working Space Size	Variety of Tools	Process	Fragility	Average piece score
A.2.1											
A.2.2											

Product Architectural Design Guidelines

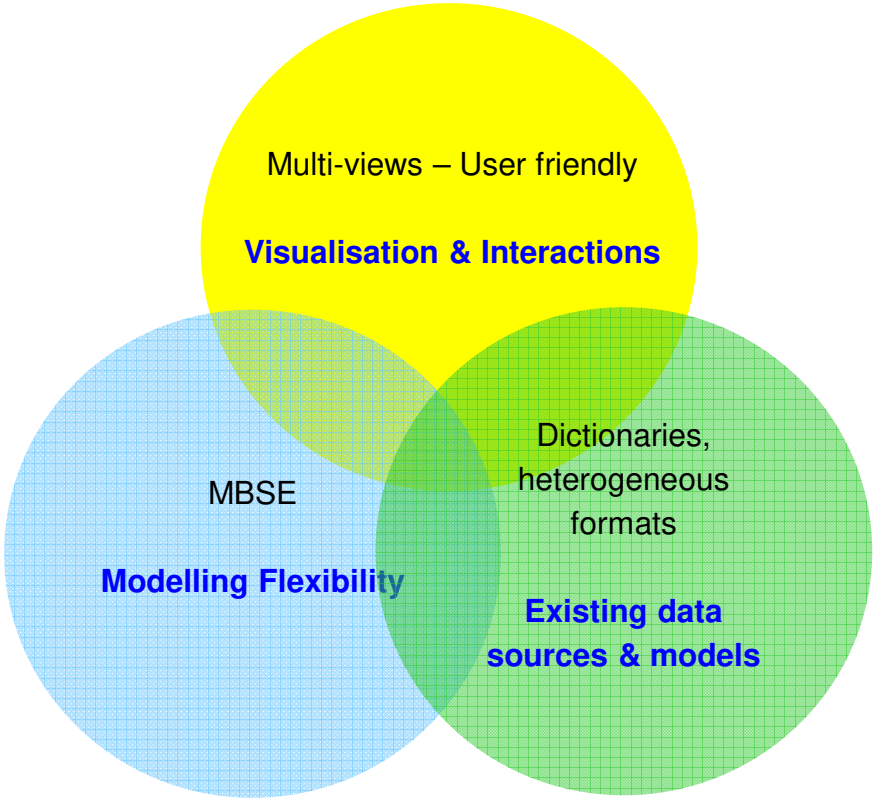
5- Aircraft Evolutions

Design Means – Virtual Reality



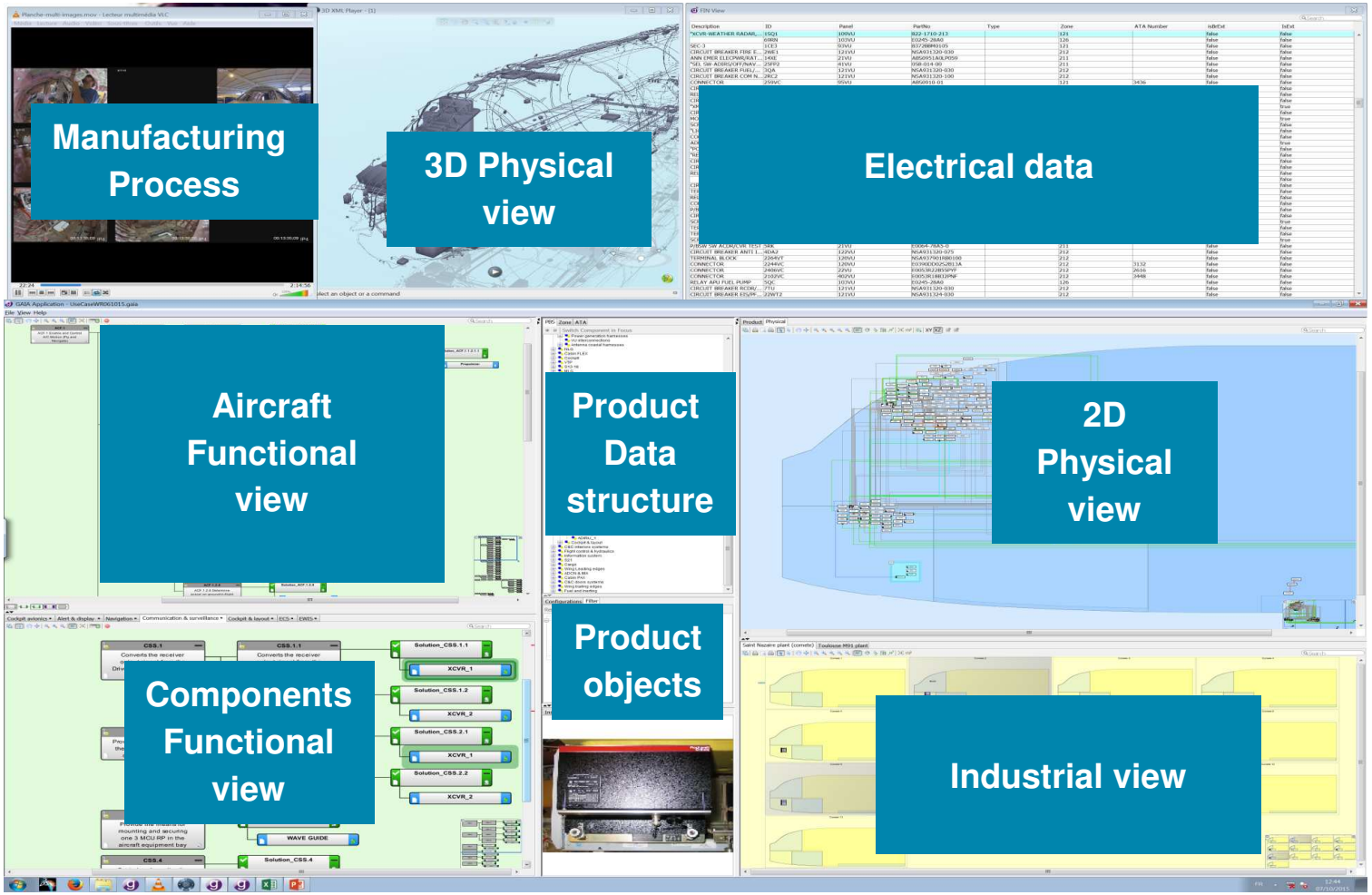
5- Aircraft Evolutions

Architect Cockpit



5- Aircraft Evolutions

Architect Cockpit



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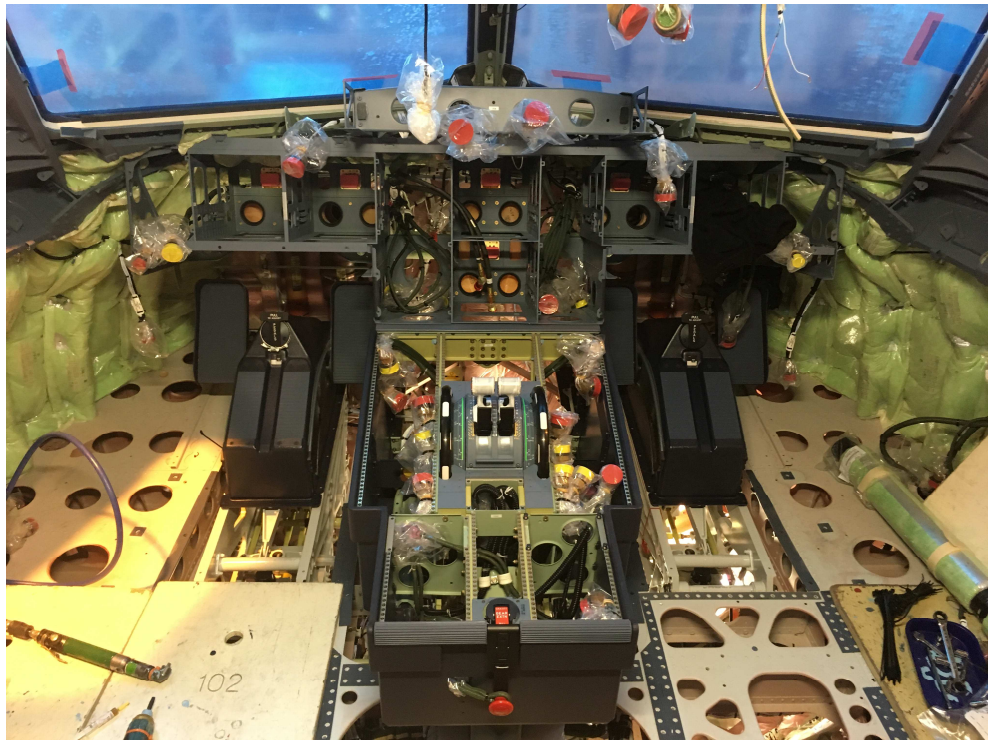
5- Aircraft Evolutions

Main Instrument Panel Module

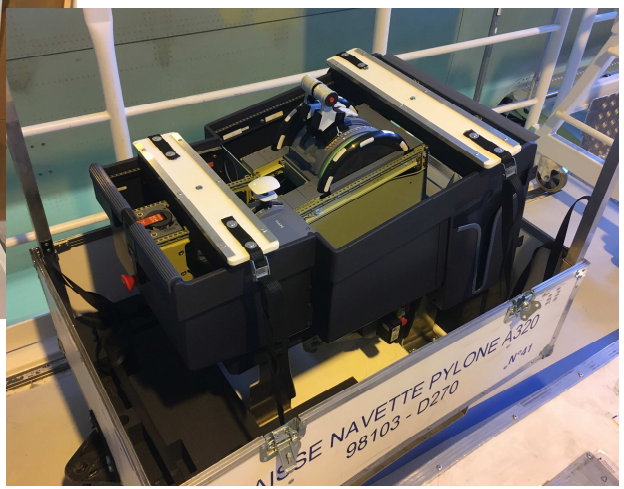
Current Baseline



Instruments Panel

Harness

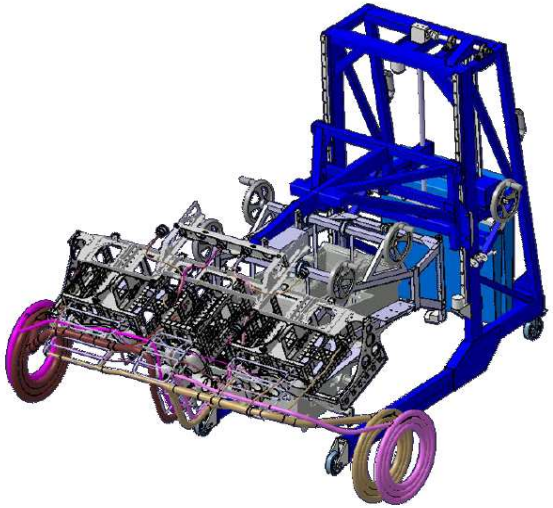
Central Pedestal



5- Aircraft Evolutions

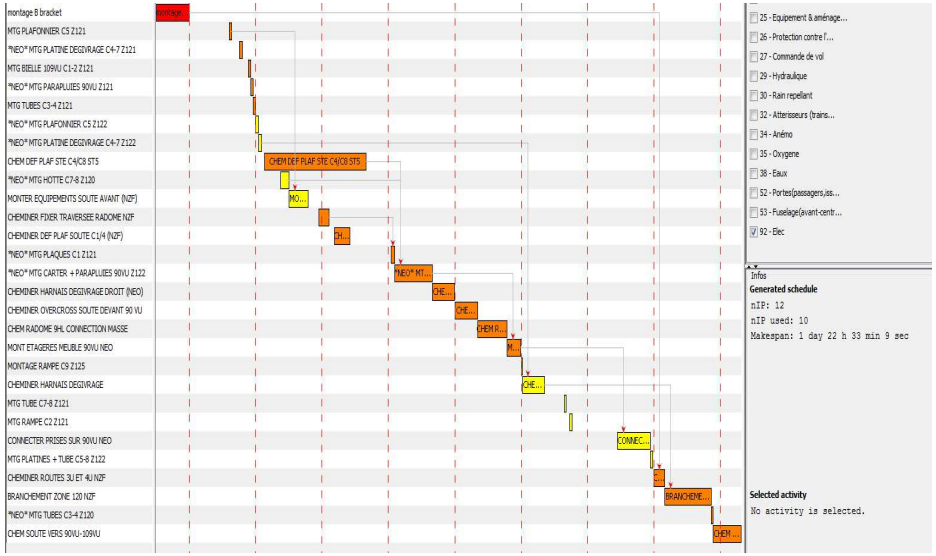
Main Instrument Panel Module

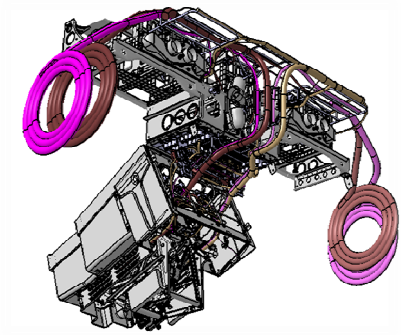
New Baseline



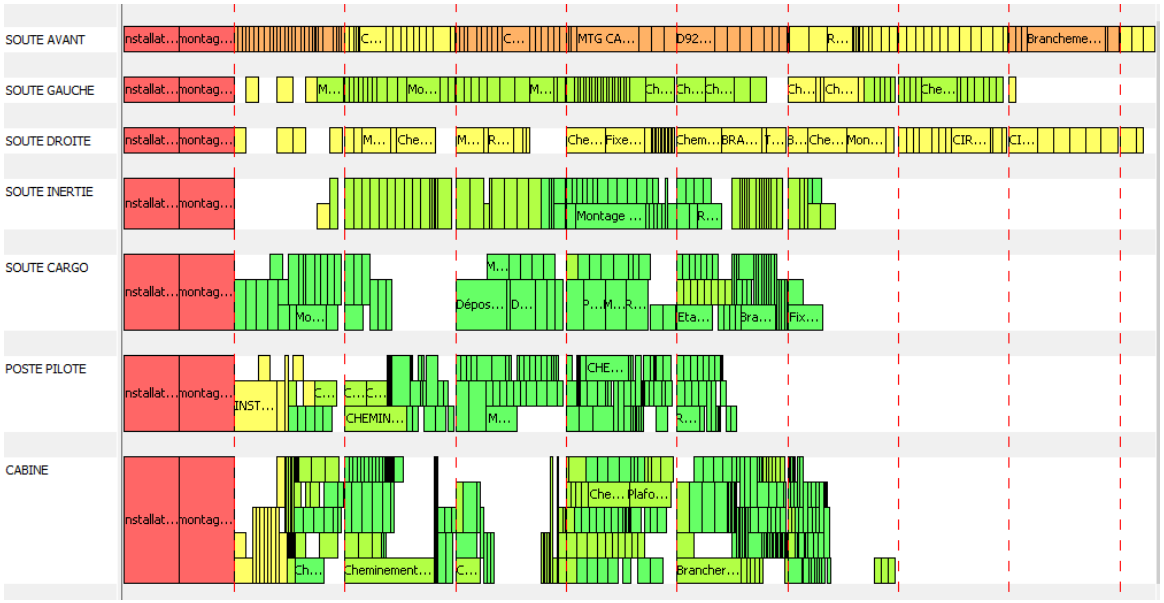
6- Assembly Sequence Optimisation

Concept Assessment v.s. Industrial Performance





- Assembly Lead Time saving: 1 station over 10
- Assembly Duration: 1 week (10s computation)



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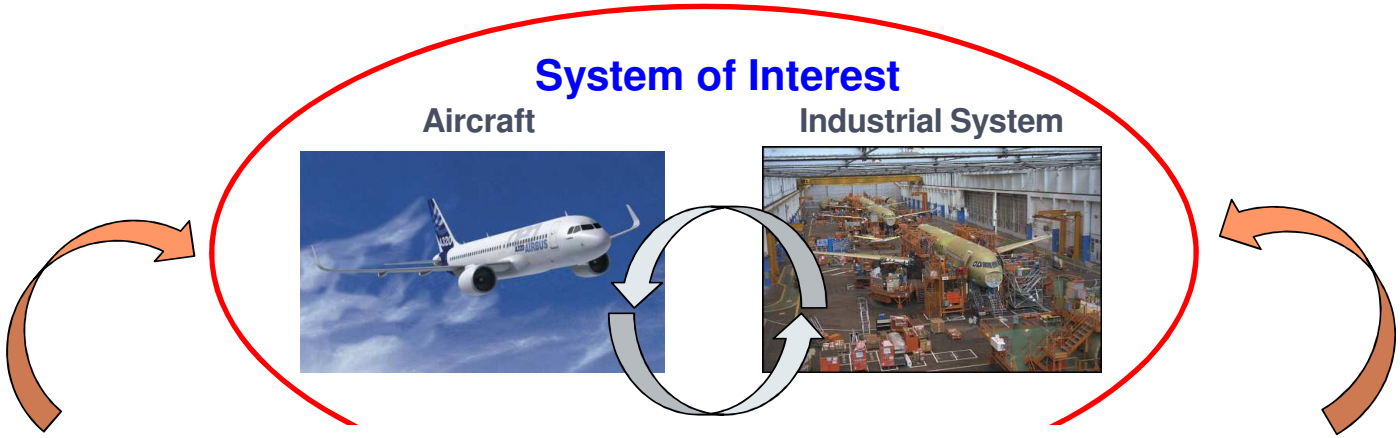
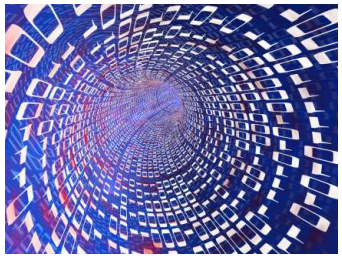
7- Conclusion





“Digitalisation” is a key enabler

Models, knowhow, quick access to information

Co-Conception

Right balance between aircraft / industrial performances

New competences

Multi-criteria optimisation methods

Find the most convenient solution

Thank you…

Questions ?

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