

# **Data-Centric Framework for Digital Twin Development of an Aircraft System**

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# **1. RESEARCH MOTIVATION**

Twin

- With the rapid digitalisation in commercial aircraft industries, emergence of Digital Twin (DT) ۲ is significant as it can fulfil the urgent need of data-driven optimisations in existing products, operations and services
- Considering the complexity of the systems and multidisciplinary data in an aircraft, ulletdevelopment and implementation of DT is challenging
- The research is intended to develop a data-centric framework to enable the creation of a ulletfully representative DT for aircraft system

### 2. AIM & OBJECTIVES

To develop a data-centric framework to enable the creation of Digital Twin (DT) for aircraft system



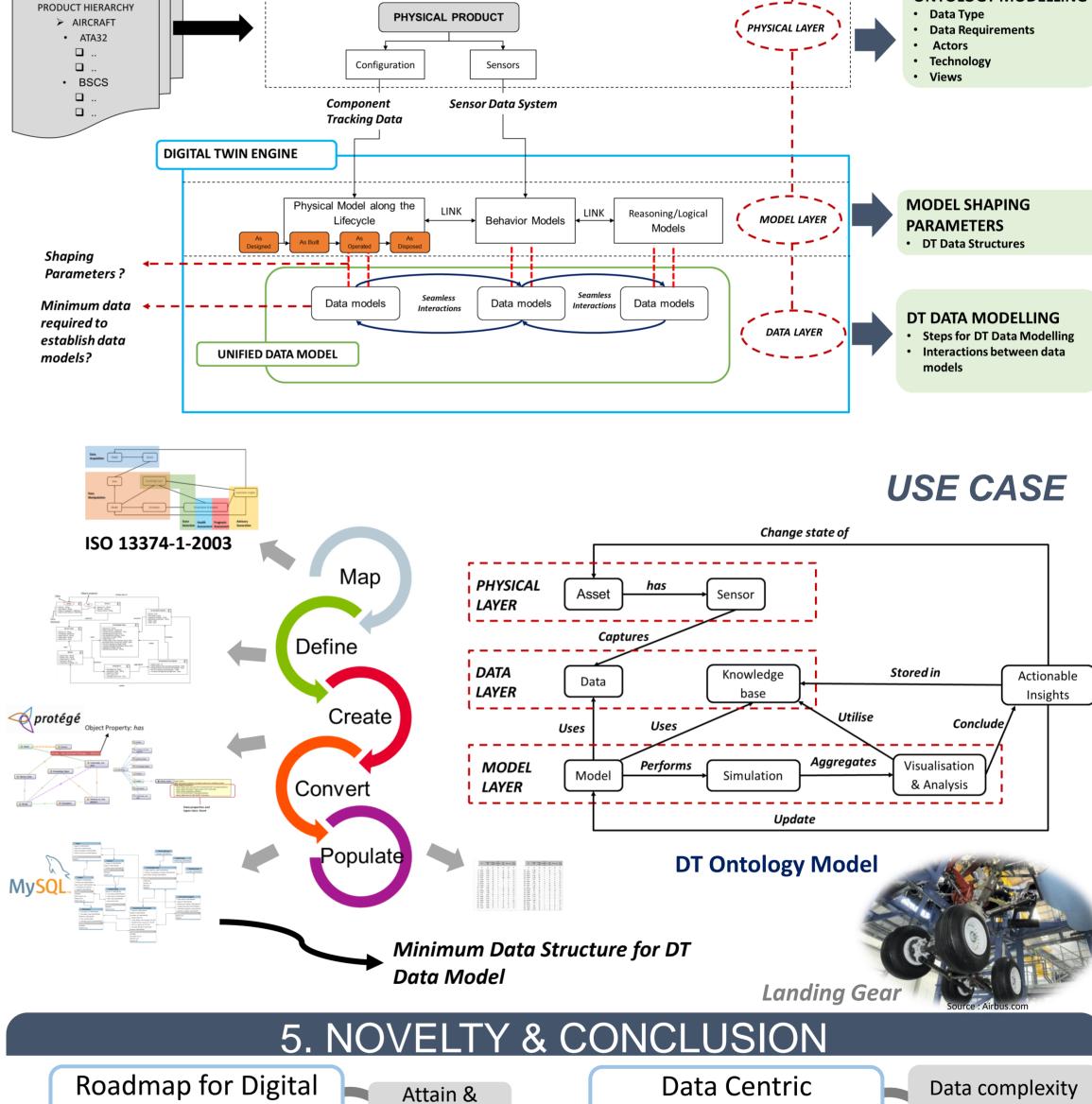
#### 4. FRAMEWORK

3 essential components of DT

**ONTOLOGY MODELLING** 

#### **Objectives:**

- Understand the current practices and state-ofthe-art in managing DT
- Clarify the concept of DT within the scope of the lacksquarecommercial aircraft industry
- Identify the key phases and data elements for DT ۲ in commercial aircraft industry
- Framework to Develop а optimise data • management for DT for an aircraft system
- Validate the framework with real life case studies  $\bullet$ and expert opinions



## 3. METHODOLOGY

- Problem statement foundation
- Existing literature & gap analysis
- DT application: data-centric challenges & missing opportunities

• Engage stakeholders

- Accessing the current state
- Knowledge development

Requirement identification

- Digital twin engine development
- Integration Framewor



Validate

Literature

Conceptual

-sation

- Feeding digital twin engine with real datasets
- Expert validation
- Framework improvement
- Boundary definition

Approach Conclusion Data modelling for DT can bridge the gap Semantics is a significant element for DT of multidisciplinary data and present IM data management infrastructure. • Metadata is as important as real data for A minimum data structure is essential for DT highly scalable DT data modelling

Adopt

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simplification

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