EASA
European Union Aviation Safety Agency

EASA-FAA AM Workshop:

EASA AI Roadmap - challenges and opportunities for use of AI in Aviation

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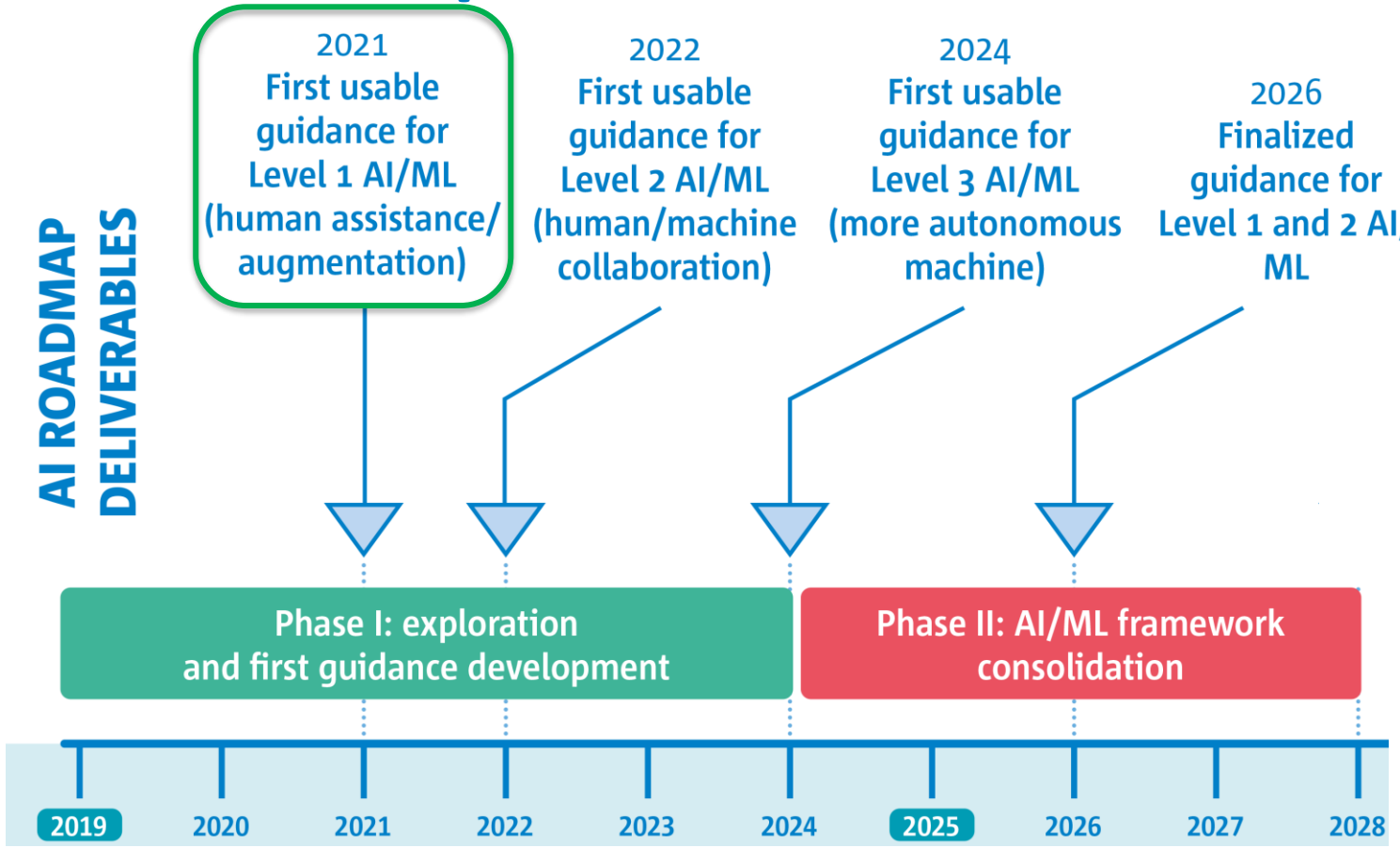
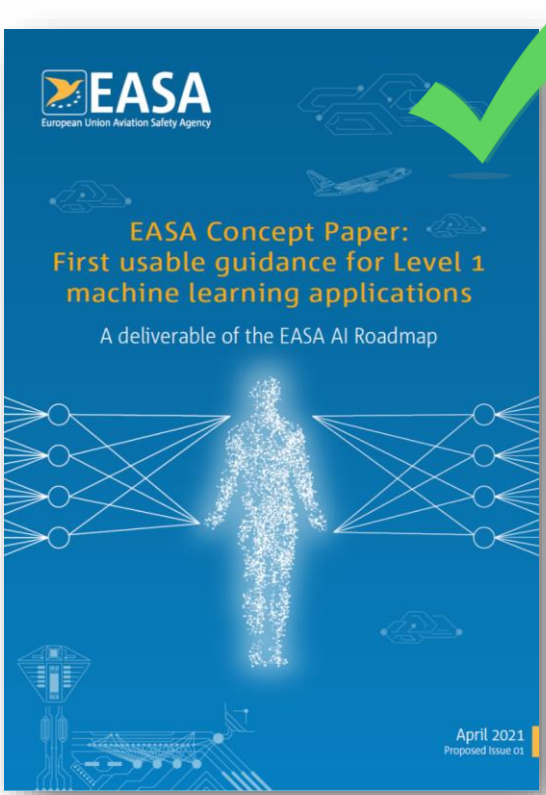
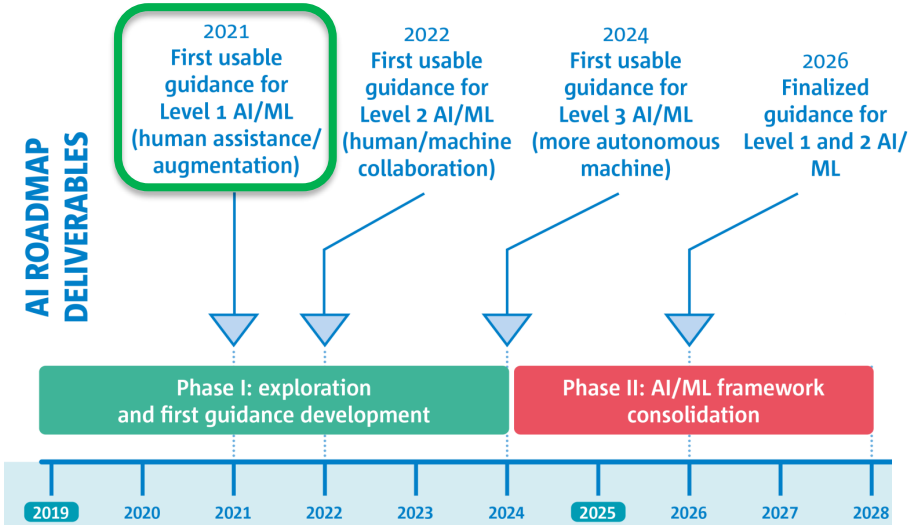
EASA AI Roadmap timeframe and milestones



EASA Level 1 AI guidance was published for consultation!



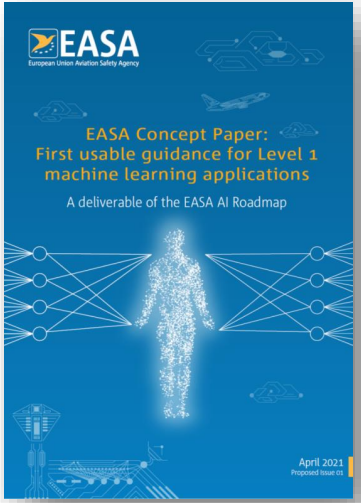


- EASA concept paper for Level 1 AI guidance has been released on 21.04.2021
- For a public consultation of 10 weeks until 30.06.2021

Scope and Objectives

- The scope is focused on an initial set of AI/ML techniques
  - Safety-related or environmental protection applications
  - Covering non-adaptive supervised learning
  - Guidelines will be enriched with other advanced techniques, in line with future updates of the EASA AI Roadmap.

- The goal of this document is twofold:
  - To allow applicants to have an early visibility on the possible expectations of EASA with respect to the implementation of AI/ML solutions.
  - To establish a baseline for Level 1 AI applications that will be further refined for Level 2 and Level 3 AI applications.

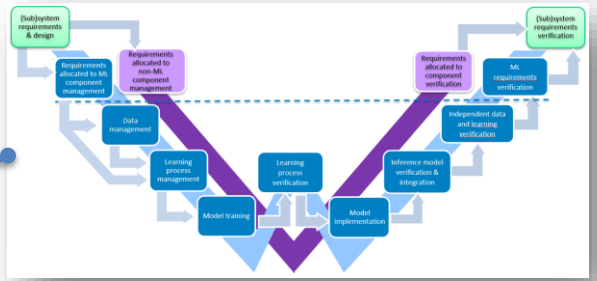


First usable guidance overview

EASA Trustworthy AI building-blocks

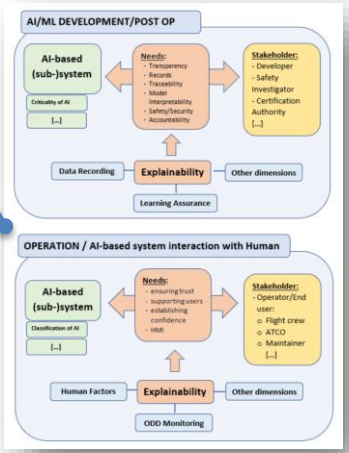
AI Trustworthiness Analysis

- Learning Assurance
- AI Explainability
- AI Safety Risk Mitigation



EC Ethical Guidelines

- Accountability
- Technical robustness and safety
- Oversight
- Privacy and data governance
- Non discrimination and fairness
- Transparency
- Societal and environmental well being



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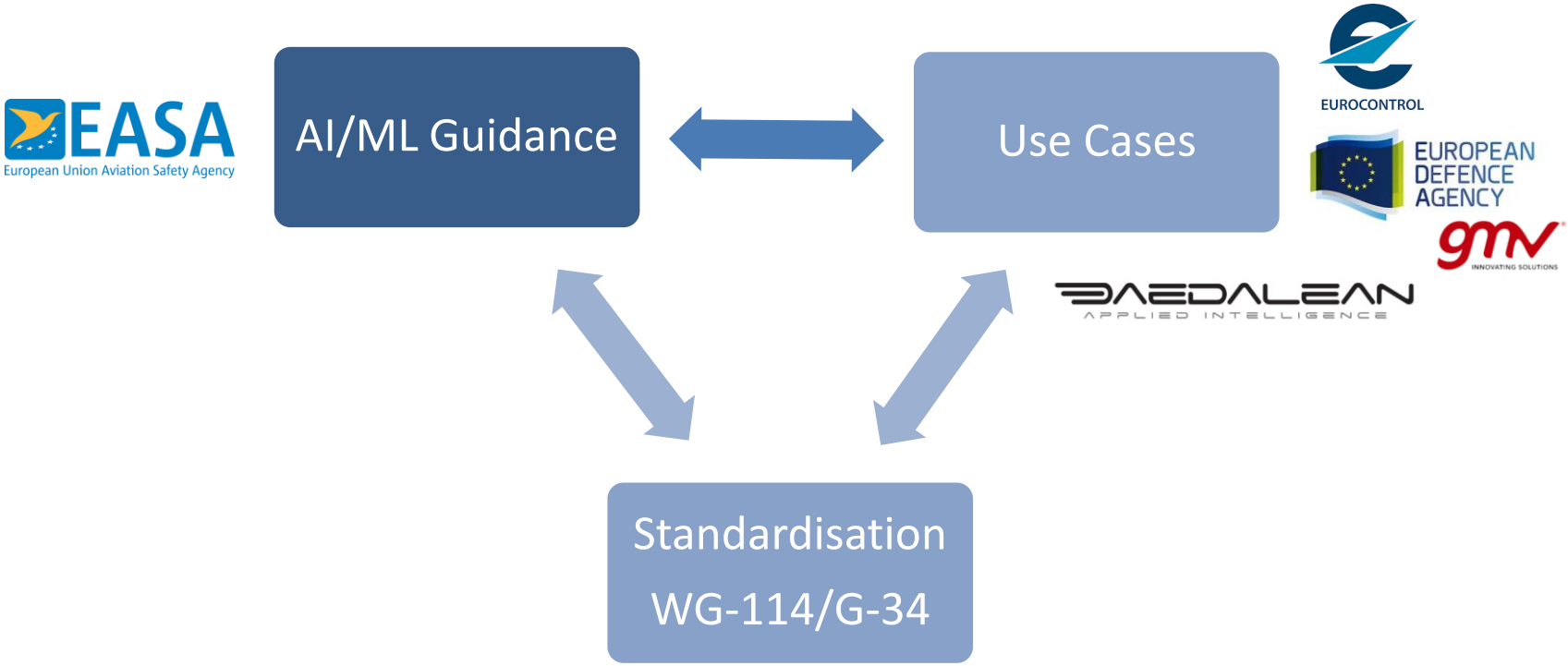
AI classification scheme

EASA AI Roadmap AI Level	High level function/task allocated to the (sub)systems
Level 1A Human augmentation	Automation support to information acquisition
	Automation support to information analysis
Level 1B Human assistance	Automation support to decision-making
Level 2 Human-AI collaboration	Overseen automatic decision-making
	Overseen automatic action implementation
Level 3A More autonomous AI	Overridable automatic decision-making
	Overridable automatic action implementation
Level 3B Autonomous AI	Non-overridable automatic decision-making
	Non-overridable automatic action implementation

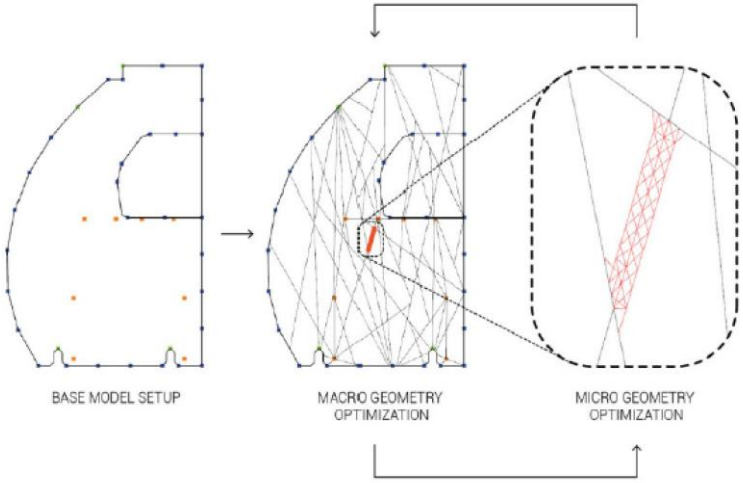
Table 1 — EASA AI typology and definitions

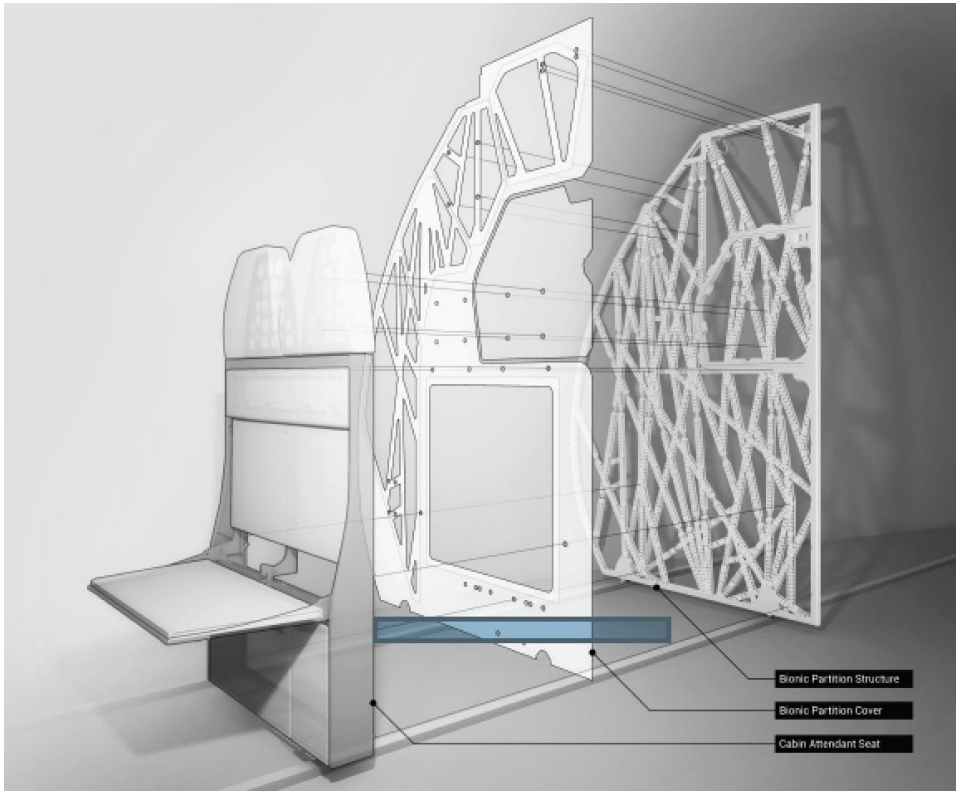
Exercising the AI Guidance with use cases



Use case - Generative design coupled with AM

- → Novel bionic partition for Airbus A 320 cabin interiors
- → Result is 45 per cent (30 kg) lighter than current designs



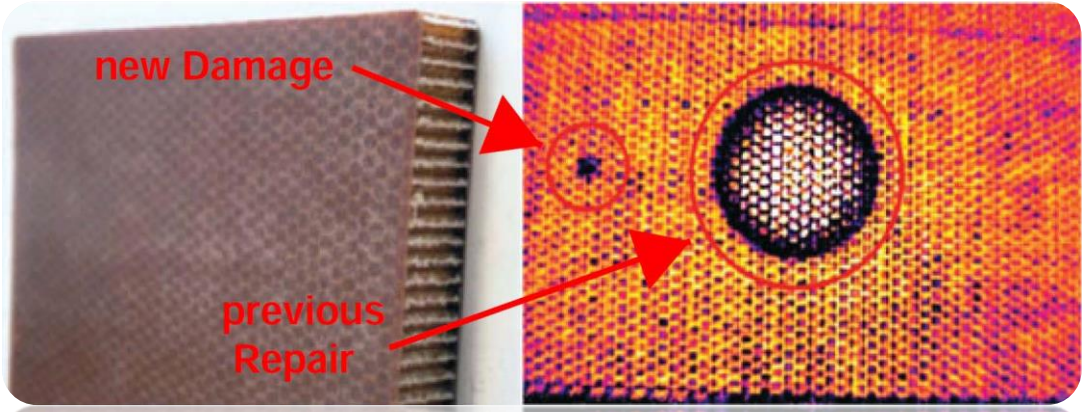


Source: GENERATIVE DESIGN: ADVANCED DESIGN OPTIMIZATION PROCESSES FOR AERONAUTICAL APPLICATIONS, S. Bagassi et al., ICAS 2016

Use case – Non destructive inspection/testing

- Recognising damage shown on digital pictures would be a typical application of AI

- The ML algorithm and the training datasets depend on the different types of structures and damages to be evaluated.



Optical and thermographic image of a GFRP (Glass fiber reinforced plastic) sandwich panel

Source: EASA concept paper : First usable guidance for Level 1 machine learning applications, proposed issue 01, 2021

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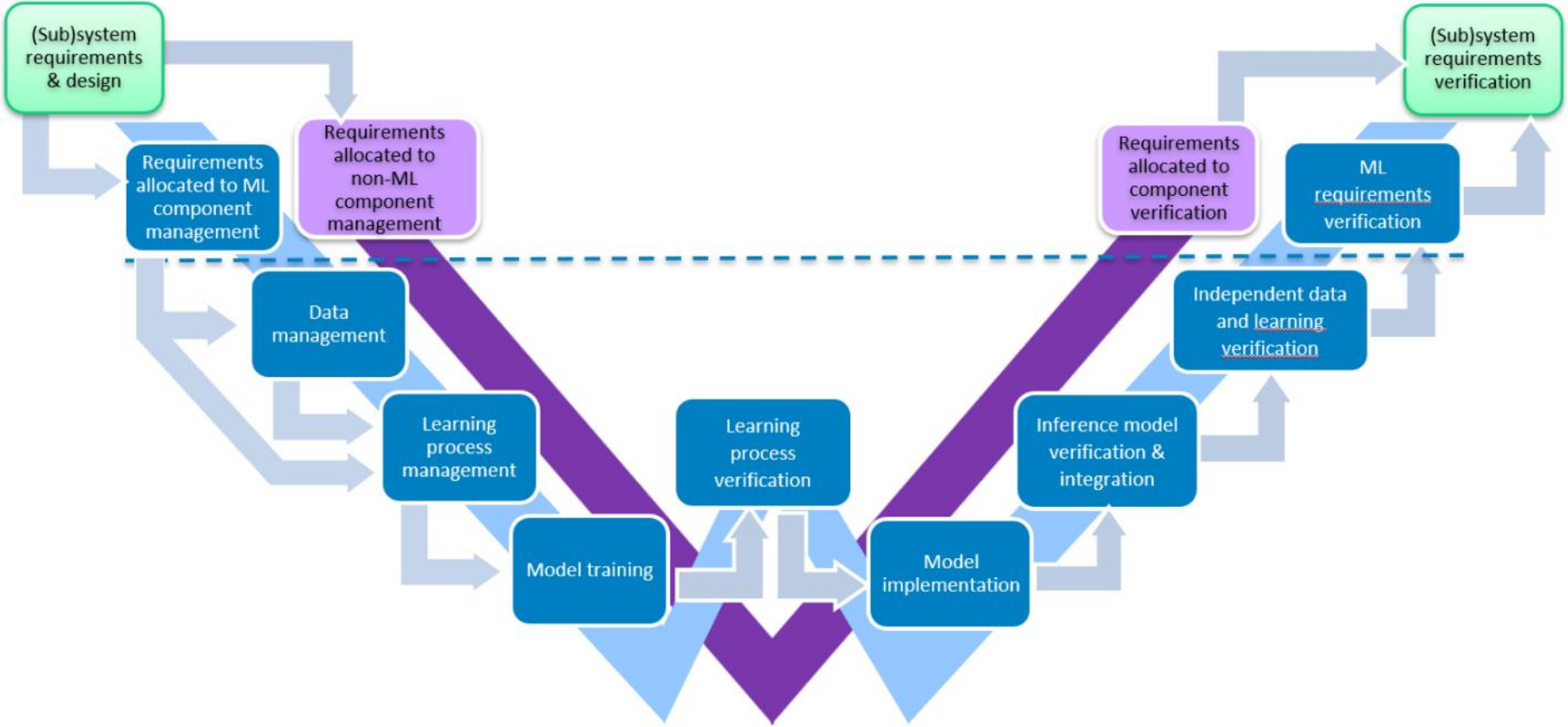
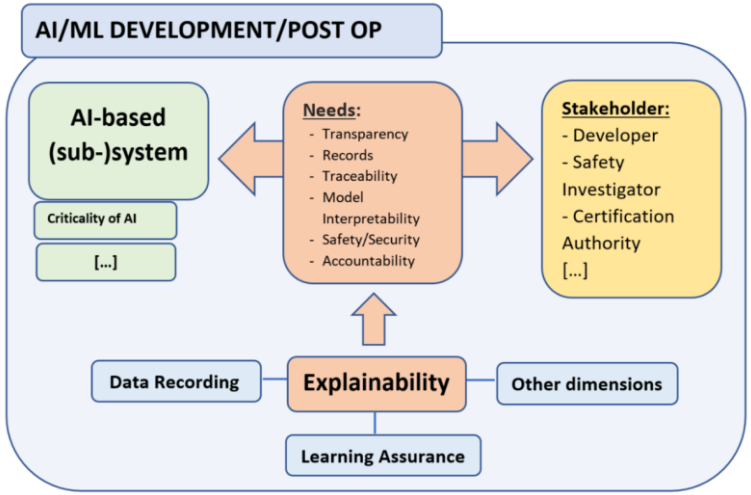
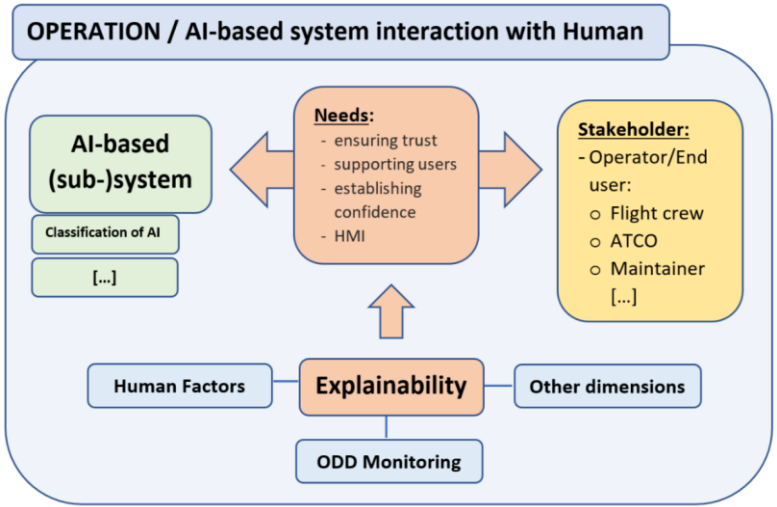
Thank you for your attention!

Any question?

Please contact us: ai@easa.europa.eu

Learning Assurance W-shaped process



AI Explainability – Overview

AI Explainability: *Capability to provide human with understandable and relevant information on how an AI/ML application is coming to its results.*