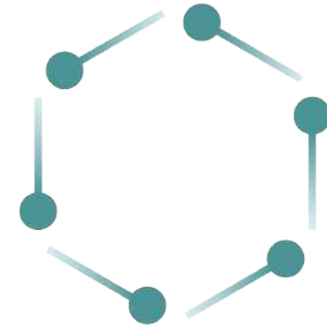


From Prediction to Action:

—

Integrating an Unstable Approach Prediction Tool for Stabilized Approach Assistance

Haiku – Ai in Aviation
27/06/23



SafeTeam



Funded by
the European Union

Under project number
101069877

Case Study Overview

01

D3.2 Overview



	2022						2023						2024						2025																				
	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun			
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36			
	Phase I												Phase II																										
WP1 Management	MS1 MS2											MS3 MS4													MS5						MS6								MS7
WP1 Management																																							
1.1 Project Management Plan and DMP																																							
1.2 Final project report																																							
WP2 Novel Approach to Human Factors, safety and resilience																																							
2.1 Design principles for digital assistants and HF assessment r																																							
2.2 Human performance and automation integration report																																							
WP3 Case studies technology																																							
3.1 Human factors design principles for an en-route digital assi																																							
3.2 Human factors design principles for a stabilised approach of																																							
3.3 Human factors design principles for Evidence Based Training																																							
WP4 Case studies demonstrations																																							
4.1 Human-machine collaboration in en-route operations																																							
4.2 Human-machine collaboration in destabilised approaches																																							
4.3 Human-machine collaboration in Evidence Based Training																																							
WP5 Organisational and Regulatory preparedness																																							
5.1 Bow-Tie analysis for AI case studies																																							
5.2 Regulatory cohesion for digital assistants Implementation																																							
WP6 Dissemination and Exploitation																																							
6.1 Communication, dissemination and exploitation plan																																							
6.2 Final communication, dissemination and exploitation repor																																							

D3.2

Objectives

Define a case study for the Stabilized Approach Digital Assistant, taking into account the following aspects:

- **Operational** - user perspective - expected use, challenge to solve, requirements
- **Technological** - TRL, data, targeted autonomy, AI performance (explainability, accuracy, recall...)
- **Human factors** - HMI, responsibilities distribution, safe teaming



D4.2

Outlook

Implement the case study in the Research Simulator, including:

- Simulator exercises with pilots
- Human performance evaluation based on monitoring framework from WP2
- Safety/Resilience Impact evaluation in a relevant environment



Case Study Assets

Machine Learning Model

02

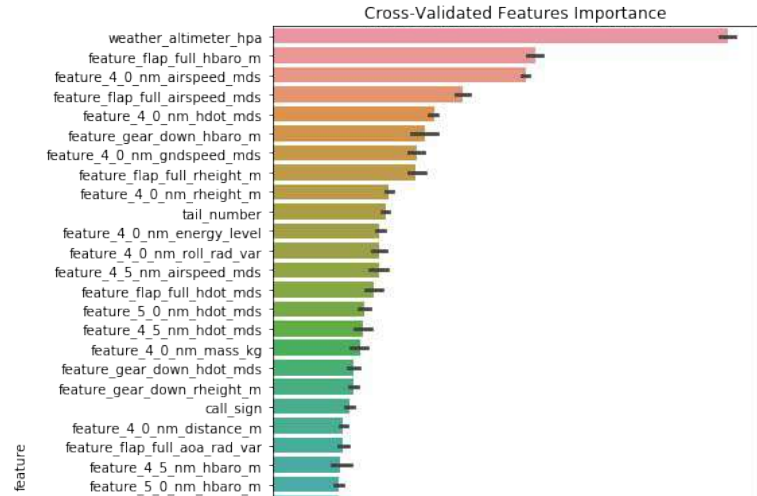
SafeClouds.eu Results

static Prediction

Two possible machine-learning strategies were investigated

- Static prediction at 4NM from RWY threshold
- Features are computed from 10NM – 4NM in 0.5NM steps
- Prediction Quality:

Class	Precision	Recall
Not UA	0.97	1.00
UA	0.85	0.53



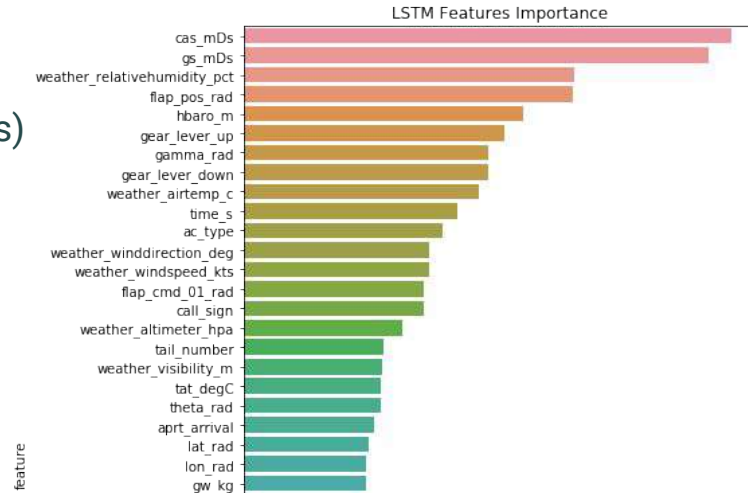
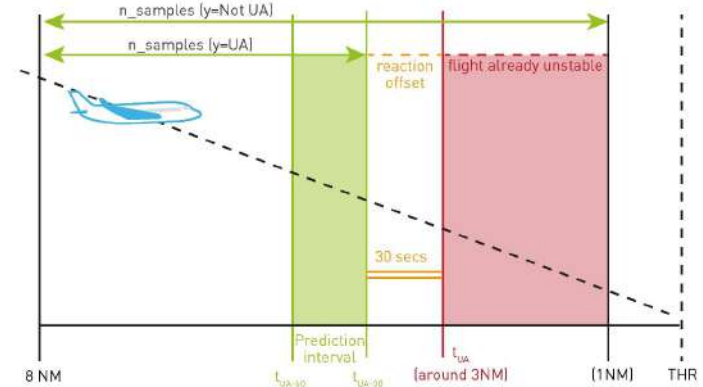
SafeClouds.eu Results

dynamic Prediction

Two possible machine-learning strategies were investigated

- Dynamic prediction - providing the likelihood of an UA within 30s prior to the event
- Uses QAR time series data as input (no preprocessed features)
- Prediction Quality

Class	Precision	Recall
Not UA	1.00	0.94
UA	0.77	0.98



Case Study Definition

03

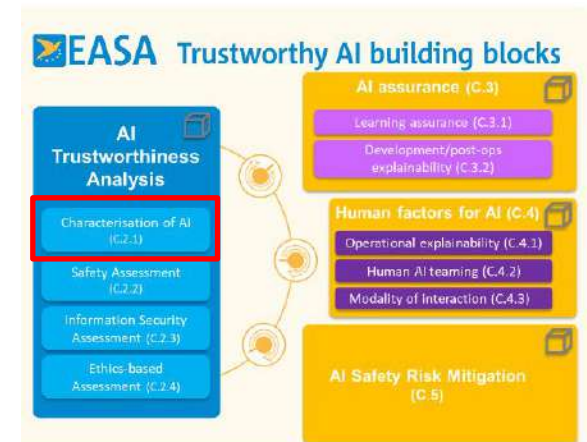
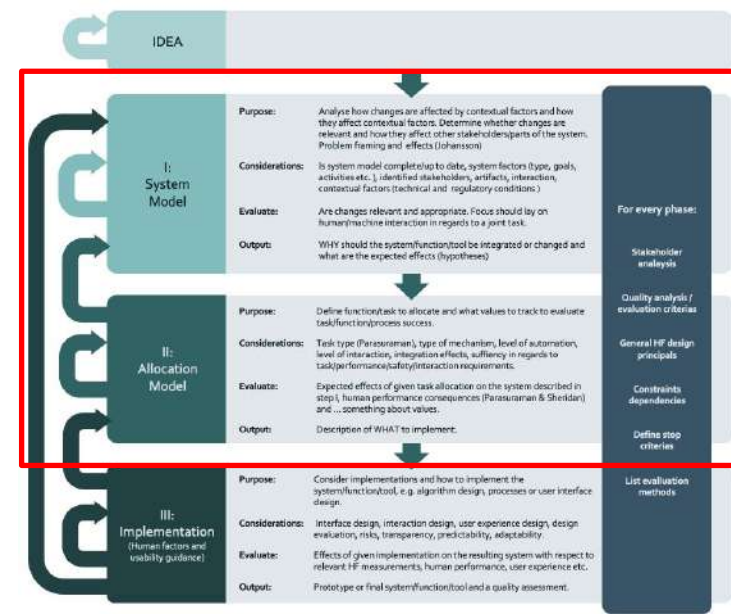
Methodology

SafeTEAM Design Principles and HF Assessment:

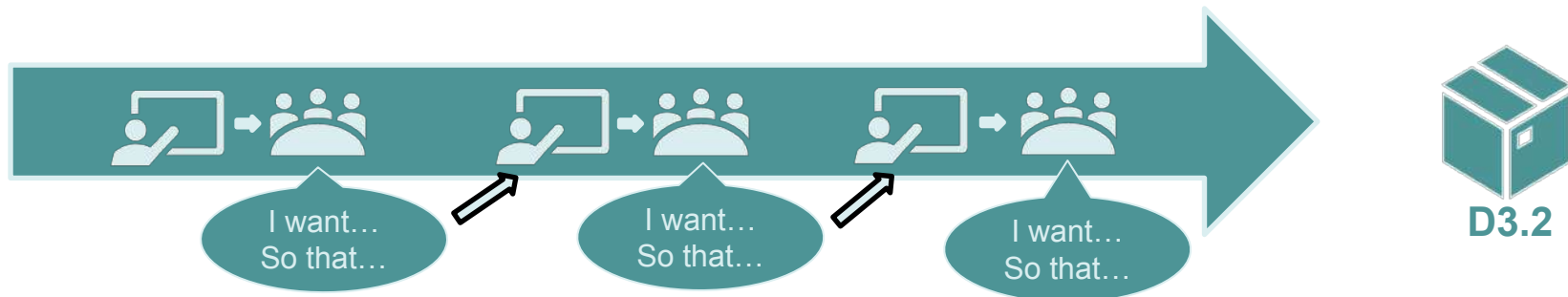
- develop digital assistants from **Idea** to **Implementation**

EASA Guidance on AI: Trustworthy AI building blocks:

- Objectives for Characterisation of Ai
- Initial Concept of Operation for the Stabilized Approach
Digital Assistant Case Study



Workshops with Stakeholders



In each workshop, we structured the question into the categories:

- General
- Operation
- HMI
- Machine Learning



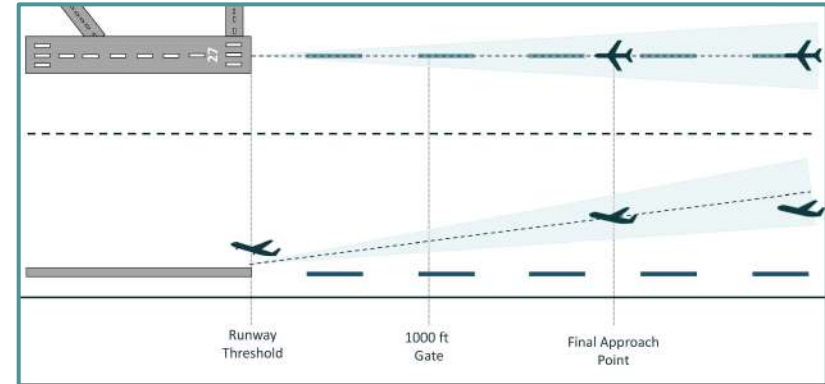
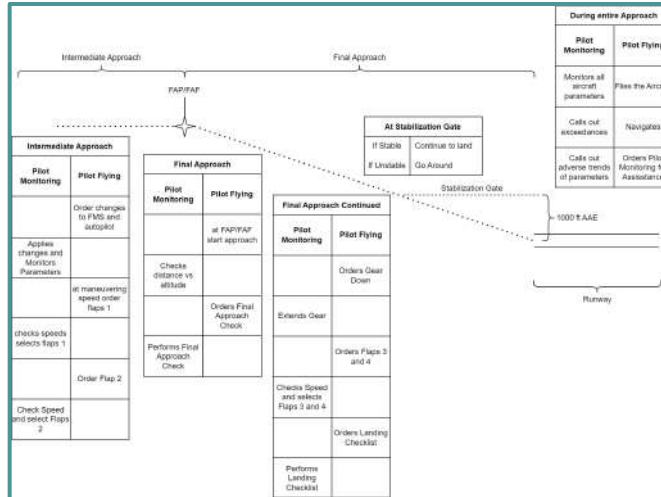
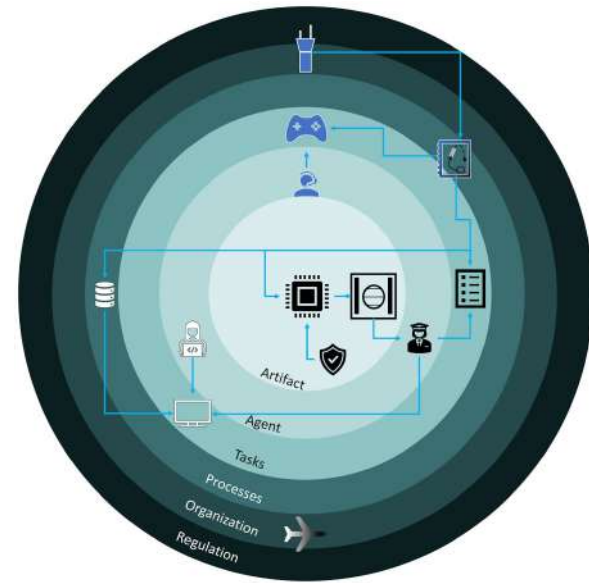
Stakeholders' feedback:

- expectations/benefits
- expected negative impacts
- domain knowledge
- boundaries of the envisioned digital assistant

Understanding Existing System

The system model contains information on the system:

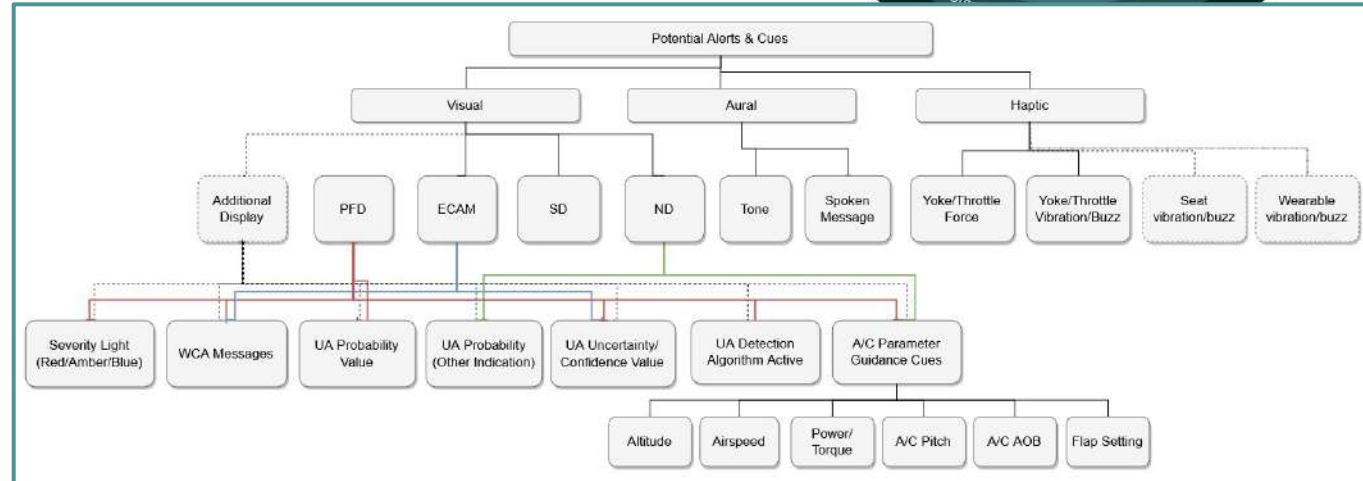
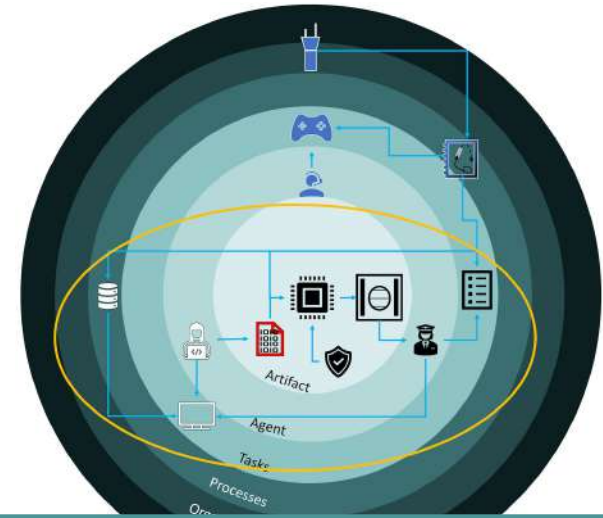
- **boundaries**
- stakeholders
- processes
- **tasks**
- agents
- artifacts



How does the AI change the System ?

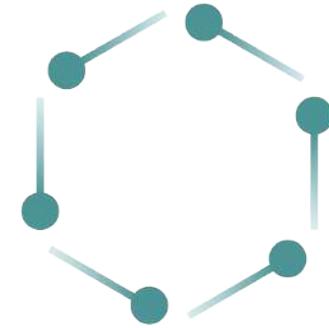
- What risks do we impose?
- What design proposals could mitigate these risks?
- What are the user requirements?

□ D3.2 Case Study Definition



Questions?

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SafeTeam



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