



PICTURE

PERCEVAL

Will we find the Holy Grail of training...

...by bringing facts and metrics to Evidence Based Training?

www.thalesgroup.com

PERCEVAL (R&T) PROJECT OBJECTIVE

Validate a **tooled approach to Evidence Based Training**, for pilots and air traffic controllers, bringing together tech, science and operational expertise, with the sponsorship of French National Aviation Authority, DGAC

« Increase safety & reduce instructor workload
by introducing facts and metrics »



Evidence Based Training, EBT

NEW TRAINING PARADIGM

COMPETENCES & OBSERVED BEHAVIOUR

Teamwork, communication, situational awareness, decision making,...

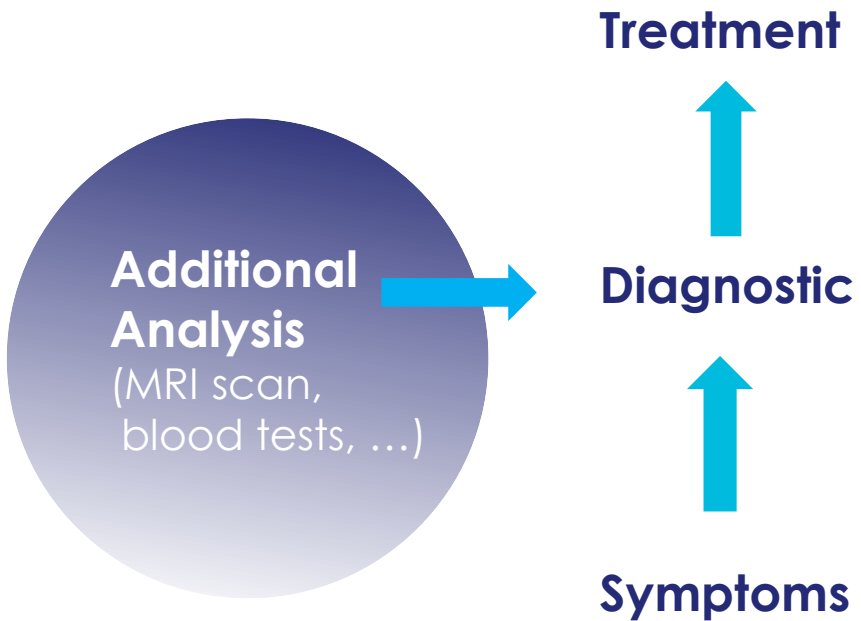
Instructor Training KEY STONE



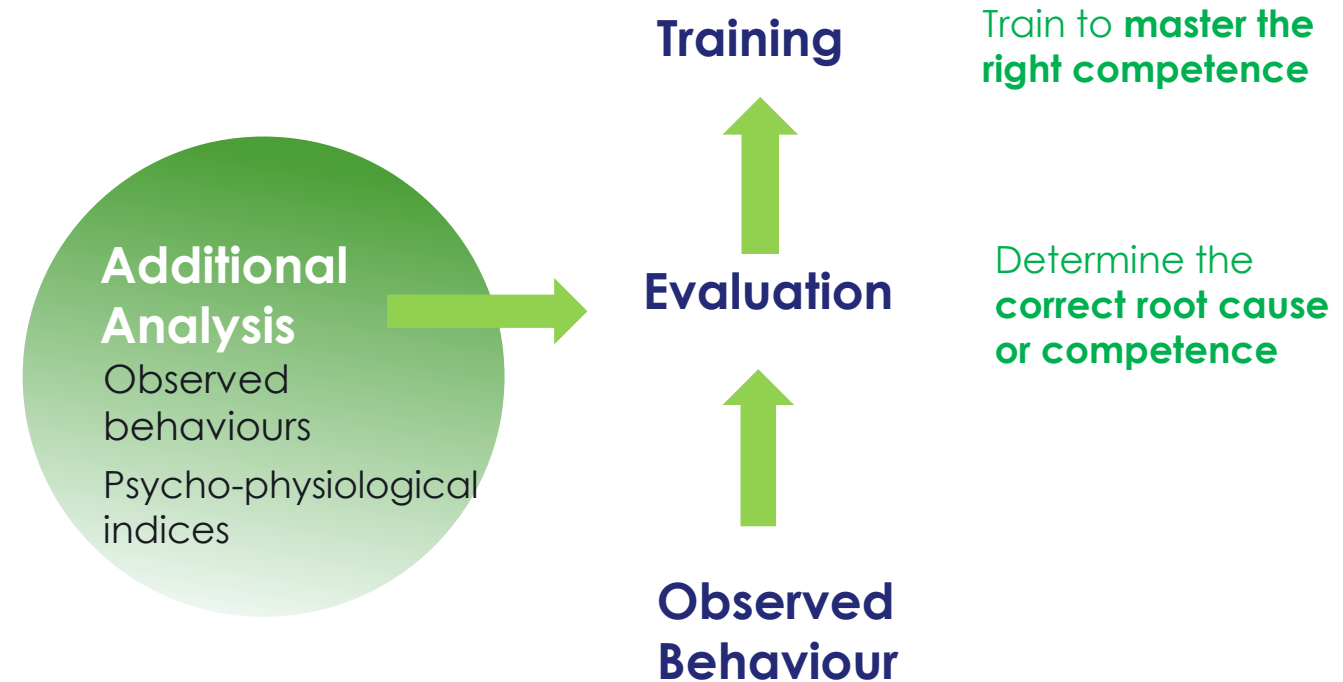
Observation is
subjective & partial

Improving the acuity of the instructor

The doctor and the patient



The instructor and the crew



APP

Behaviour
Analysis & Restitution

THE VALUE Supports
the instructor evaluation
with timely data and
analysis



DATA
CAPTURE

ENABLER : DATA
Multimodal data acquisition
from crew & « aircraft »

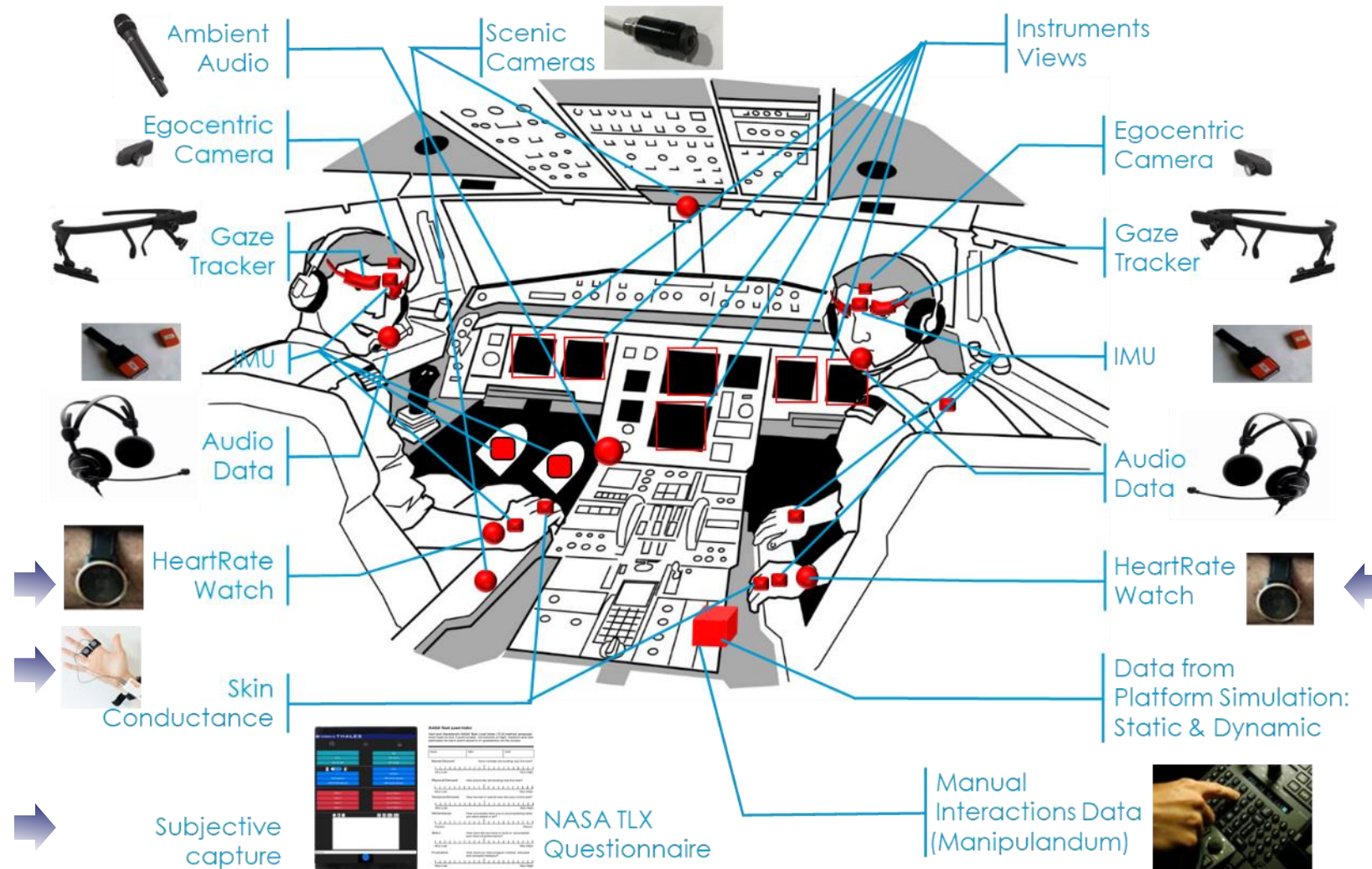
APPLICATION

- Training context
- Cognitive indicators
- Behaviour evaluation
- « Observables » detection
 - Action sequences
 - Crew interaction

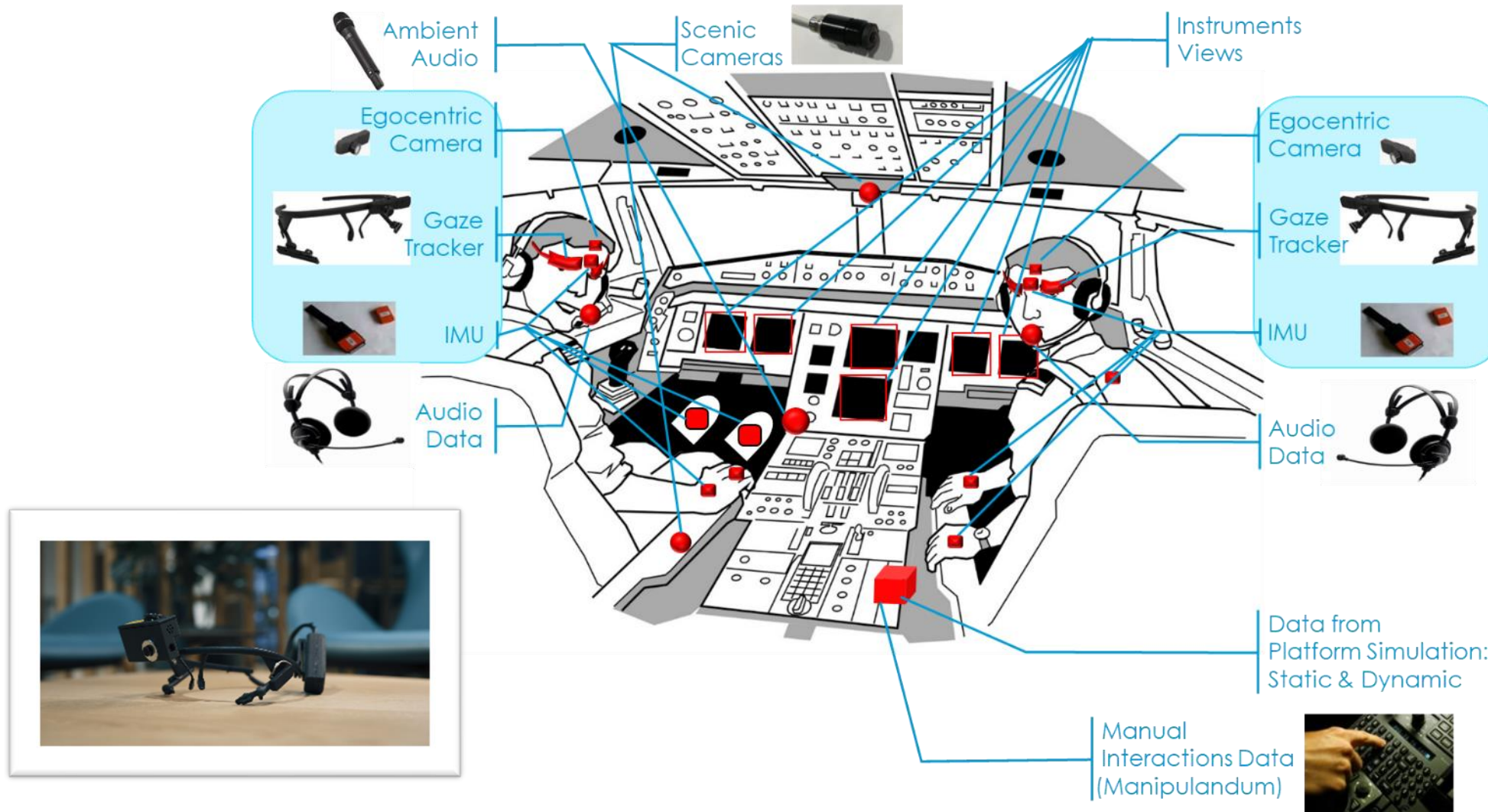
DATA CAPTURE

- Speech, gaze, touch
non intrusive
- Aircraft state
- Flight context






Full experimental set up – data recording for model construction



What the crew notices



Overview of workstreams and use cases

<p>Concept & tool development in support of EBT</p>		<p>First version of tool set for acquiring (data capture) and analyzing observed behaviors of pilots and operators. Understand & define the concepts of use for the different scenarios</p> <p><i>Instructor workshops – discussions and interviews – tech development</i></p>
<p>Crew training of pilots /FNPT</p>		<p>Adapt and deploy tool set for FNPT A320 simulator and the use case of crew training, skills assessment and learning.</p> <p><i>Experimental runs with cockpit crews</i></p>
<p>Recurrent training of pilots /FFS</p>		<p>Adapt and deploy tool set for FFS A330 simulator and the use case of recurrent training and longitudinal monitoring of pilots.</p> <p><i>Experimental runs with cockpit crews</i></p>
<p>Initial training of pilots /FNPT</p>		<p>Adapt and deploy tool set for FNPT A320 simulator and the use case of initial training and learning level assessment.</p> <p><i>Experimental runs with first time learner pilots</i></p>
<p>Training of air traffic controllers /ATC simulator</p>		<p>Adapt concept and tool set to training of air traffic controllers (CA) and deploy on the ATC simulator.</p> <p><i>Experimental runs with air traffic controllers</i></p>

Recording session – two pilots 4h night session



1st Restitution and Analysis

The screenshot displays a flight simulation interface for a "Demo session". It features three main camera views on the left: a top-down view of the cockpit instrument panel, a front-facing view of the cockpit showing three pilots, and a rear view of the cockpit. The central part of the interface shows a large, detailed view of the cockpit's instrument panel and control systems. On the right side, there is a panel titled "Observed Behaviours" which lists several events with timestamps and status indicators (green for good points, red for bad points or timeouts). The events include:

- "Confirm" (0:01:53) - Good point.
- Seq6.2: Appropriate call 'Confirmed', Correct phraseology and Sufficient voice volume by PF. (0:01:53) - Good point.
- PF visual circuit: ND and PFD but without ECAM completed within every 15s. Timeout (0:01:54) - Bad point.
- "Off" (0:01:55) - Good point.
- Seq6.3: Appropriate call 'Engine Master 1, OFF', Correct phraseology and Sufficient voice volume by PM. (0:01:55) - Good point.
- PF visual circuit: ND and PFD but without ECAM completed within every 15s. Good point, visual check on PFD and NAV by PF OK within 15 seconds. (0:01:56) - Good point.
- Seq6.4: PM to look at the Engine Master within 4 seconds. Timeout (0:01:57) - Bad point.
- PF visual circuit: ND and PFD but without ECAM completed within every 15s. Good point, visual check on PFD and NAV by PF OK within 15 seconds. (0:01:58) - Good point.

At the bottom of the interface, there is a timeline bar with various icons and a play button, indicating the progression of the session.

Results

> Non intrusive data capture OK: everything on the data capture side is up, running and functioning

Gaze tracking precision 1-2 degrees, picks up gaze « anywhere » in cockpit; Represents with trails and high lights the instrument regarded

Voice analysis of cockpit crew, air traffic controllers; who says what, when

Manipulandum: what is touched, actioned and when

Data, video, audio: correlated, timestamped and synchronized

> Analysis of crew action sequences OK: Analysis, in context, of cockpit crew multimodal action sequences to correctly assess observed behaviours

« in context »: Training Scenario/exercise, Aircraft state, flight sequences, environment form the back drop against which the above is analysed

> « Observable behaviours »/ « Competences » with Explainable AI OK

Preliminary results

Acceptability

> Pilot comfort: ongoing with head gear, initial results positive (limited number of participants!)

Prototype; light weight, works well with glasses, no discomfort after 4h, does not impede fringe vision (sides, up/down)

> ATOs preparing dossiers to DGAC: objective to ensure « no impact » on simulator certification; same for airline on training course.

Preparatory work and discussions OK

What's next?

Experimental runs set to start in earnest

- > Continuing on acceptability / regulatory
- > Cognitive indices work to follow

News on the above towards the end of the year

GET INVOLVED !

PERCEVAL Online Community

Join the discussion via [PERCEVAL LANDING PAGE](#)

GETTING PRACTICAL; with « The Tester » Perceval Breakout Stream:

Integrating into Instructor workflow – efforts published in the Instructor « test » tool: interactive and based on prerecorded data

Test & give your view! The floor is yours...

Contact

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PERCEVAL

Landing page



<https://lnkd.in/ejf762hD>