

A close-up profile of a pilot wearing a helmet and headset, looking out of a cockpit window. In the background, a fighter jet is flying against a blue sky. The overall lighting is cool and blue-toned.

Increasing Training Efficiency through Automated Learner Performance Evaluation

Robert Siegfried, Torsten Müller, Wilhelmine Dohmen
2023 NMSG Symposium

About Aditerna

Aditerna is a team of professionals specialized in data analytics and mission-critical information management systems.

Serving government and military customers since 2010, Aditerna offers consulting services and tools for managing simulation environments and generating insight into complex data sets.

Key projects (related to this briefing)



US Naval Aviation "FOX TWO"



EDIDP "VireTS"

Selected customers



“We don't rise to the level of our expectations; we fall to the level of our training.”

(Archilochus, c. 680 – c. 645 BC)



Recommended Scenario Adaptations

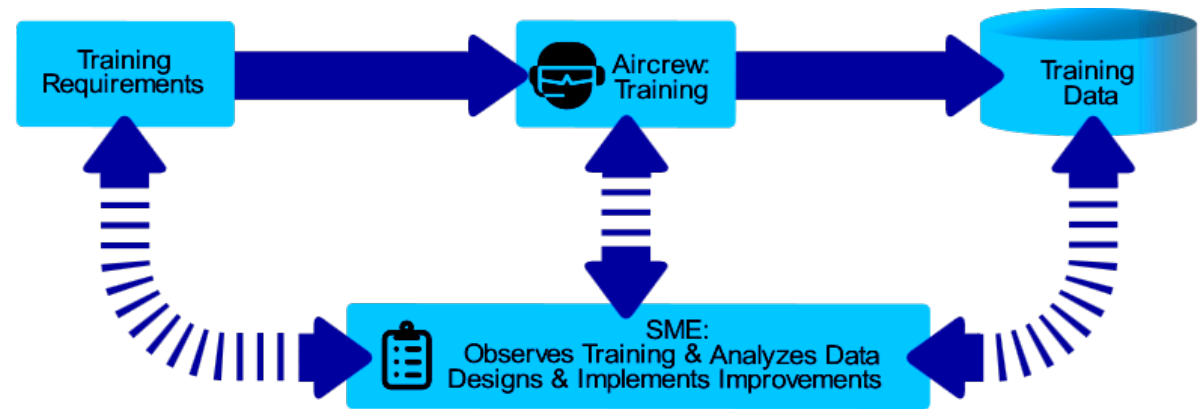
- Side Wind
- Engine Failure

- Side Wind
- Engine Failure



Current challenges in training assessment

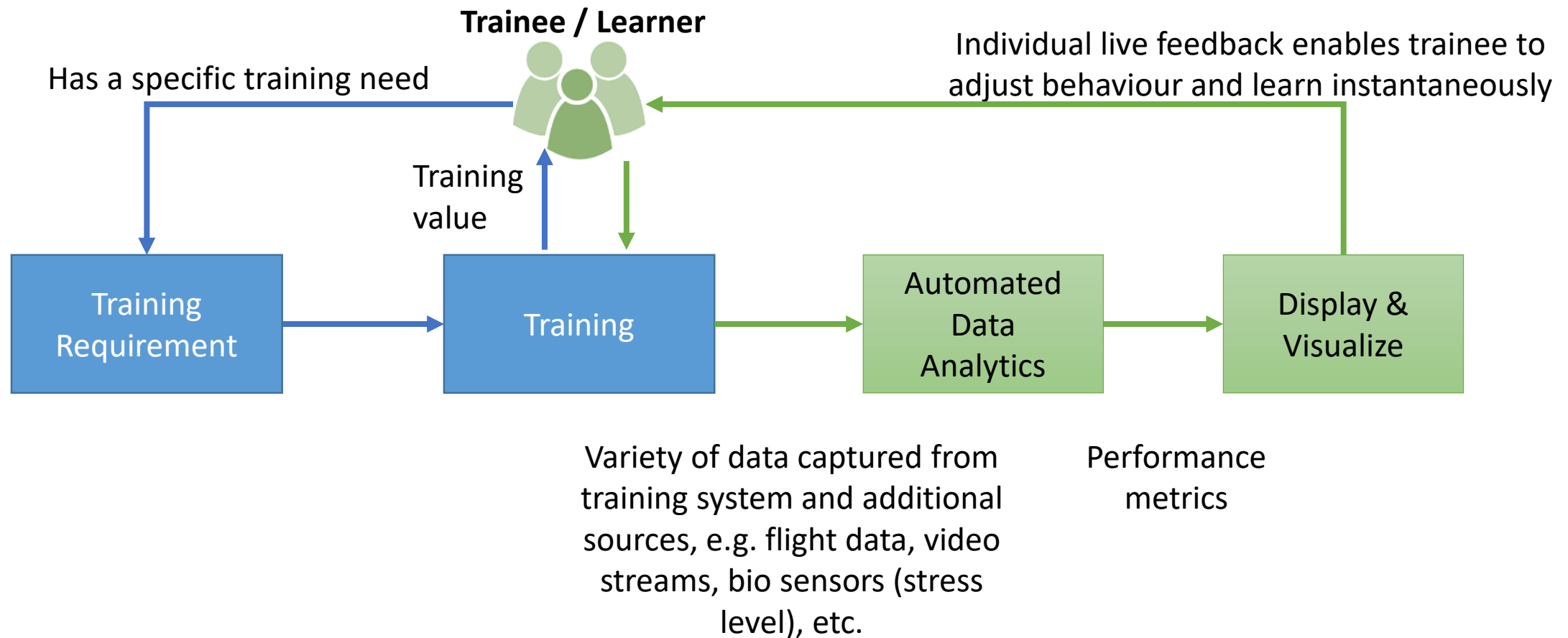
- Increasing data volumes: increasing magnitude and complexity of reviews and assessments
- Insufficient automation: dependence on availability of suitably qualified and experienced personnel
- Scarcity of expert personnel: less training opportunities and assessment available
- Varying qualifications, experience, background etc. of instructors: risk of subjective training assessment
- Varying quality, scope, documentation etc. of training assessments: limited comparability
- Complexity of including additional information: risk of information not getting (fully) integrated
- Stronger focus on soft skills and more social elements in simulation trainings: pure reliance on quantitative metrics and automated assessments yields little success, yet hybrid approaches not fully developed



AUTOMATED PERFORMANCE ASSESSMENT

Automated evaluation of training performance through advanced algorithms, analytics, and machine learning minimizes bias while enabling real-time feedback to optimize outcomes and resource allocation.

Establishing a better feedback loop



Automated Performance Assessment - Main objectives

Support instructors

- Provide objective, data-driven feedback on trainee's performance
- Resource Optimization: Automate routine tasks

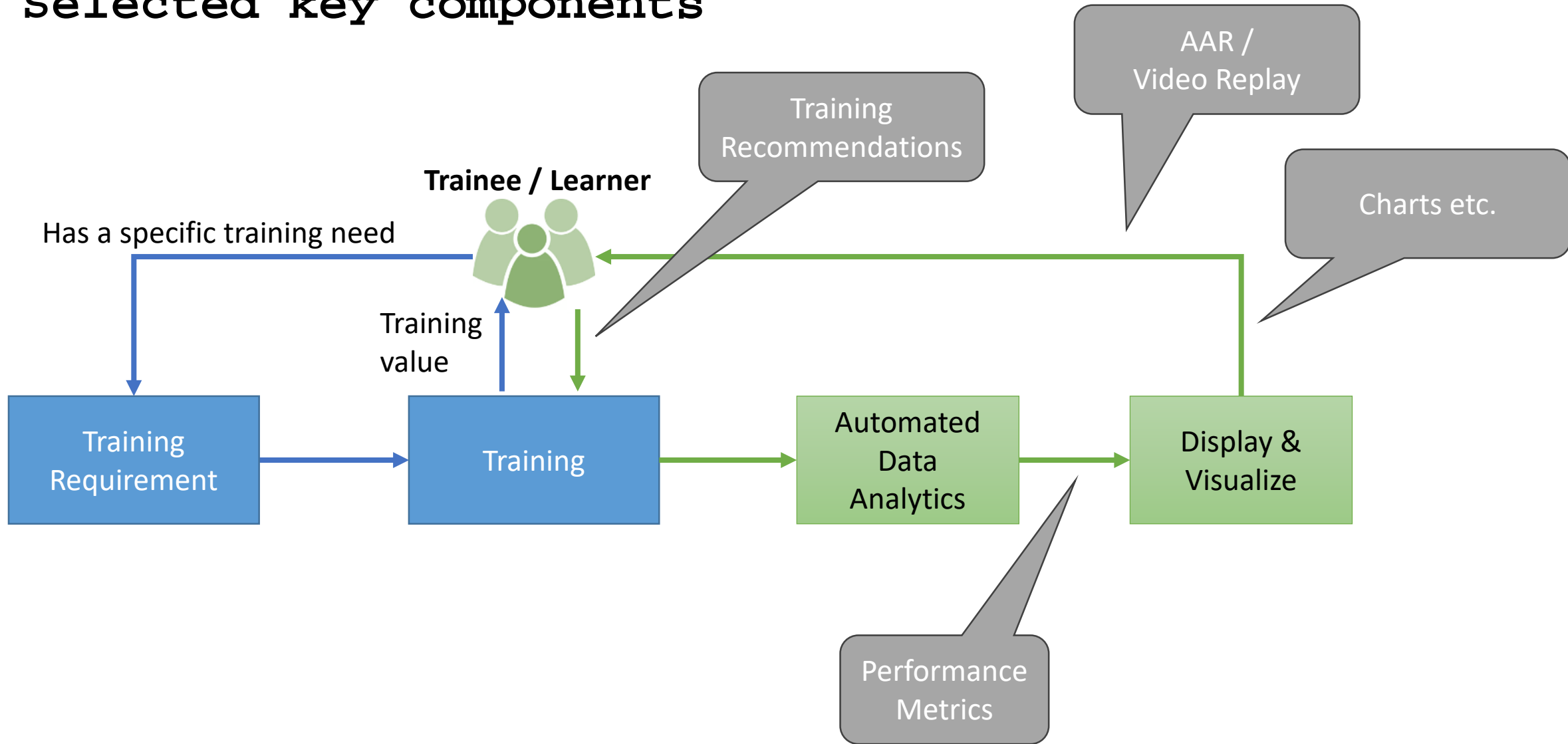
Support trainees

- Enable trainees to assess training results with or without instructor present
- Realtime feedback enables dynamic and responsive training environment to match trainee's proficiency

Improve training

- Long-term tracking of performance/development over time
- Continuous improvement, i.e. leveraging collected data for iterative refinement of training programs
- Standardization of performance metrics across diverse training programs: more reliable evaluation
- Scalability to accommodate small or larger numbers of trainees, or adapting more complex training scenarios

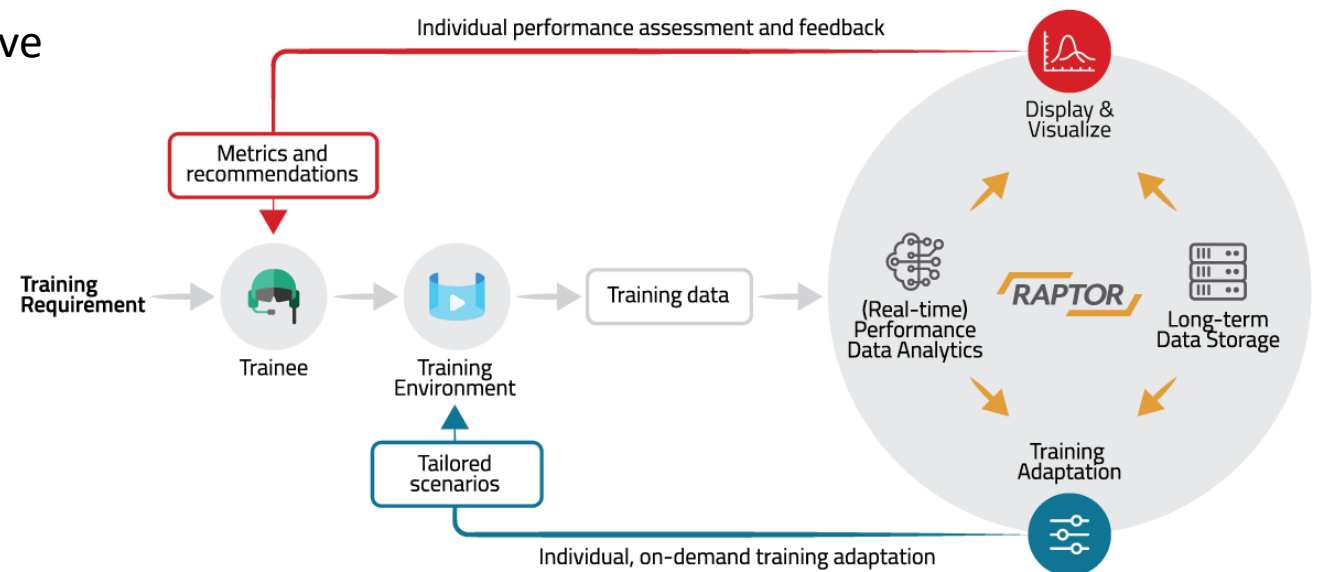
Selected key components



Market Overview

A variety of tools have been developed to serve needs similar to those addressed by Automated Performance Assessment. These tools offer a range of functionalities, from real-time performance metrics to advanced analytics and simulation-based training assessments. Some of these tools and notable efforts include:

- Generalized Intelligent Framework for Tutoring (GIFT)
- Air Force (USAF) Secure Live Virtual Constructive Advanced Training Environment (SLATE)
- Cervus XCaliber for marksmanship training
- Aptima Learning Analytics
- Aditerna RAPTOR



Current and future developments

Individual training

- Integration of Biosensors
- Real-time Assessment and Adaptive Training
- Spatial Analysis (where applicable)
- ...


Team Training

- Motion Profiles
- Communication Analysis (patterns, frequency, ...)
- ...

Assessment of larger groups (e.g., 4-ship, company, ...)

Key Observations

- Highly active field
- Lots of great ideas are explored
- Enormous potential
- Often disconnected analyses instead of integrated assessment
- Availability (and quality!) of data is key



Social competence may well determine whether a particular mission succeeds or fails. That means that in training and evaluation the empowerment of instructors and learners should have the same relevance as the optimization of technology.

Thank you

For further information and inquiries, please feel free to reach out.



Dr. Robert Siegfried
Aditerna GmbH
Managing Director, M&S Lead
+49 160 736 7329
robert.siegfried@aditerna.de



Torsten Müller
Aditerna GmbH
Managing Director
torsten.mueller@aditerna.de



Wilhelmine E. Dohmen
Aditerna GmbH
Product Owner
wilhelmine.dohmen@aditerna.de

