Revolutionary Trends in Military Training
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Foundational Principles of Next-Generation Training

- Competency based, not time based -- Progress with student understanding

- On-Demand, On-Command Availability -- Learning available any time and place

- Self-directed learning should be encouraged -- Learners learn best when they are in charge of their own journey

- Self-directed learners should rise to the top -- Our systems should identify and reward "aggressive learners"

Source: Roberson & Stafford, "Redesigned Air Force Continuum of Learning," AU Press, 2017
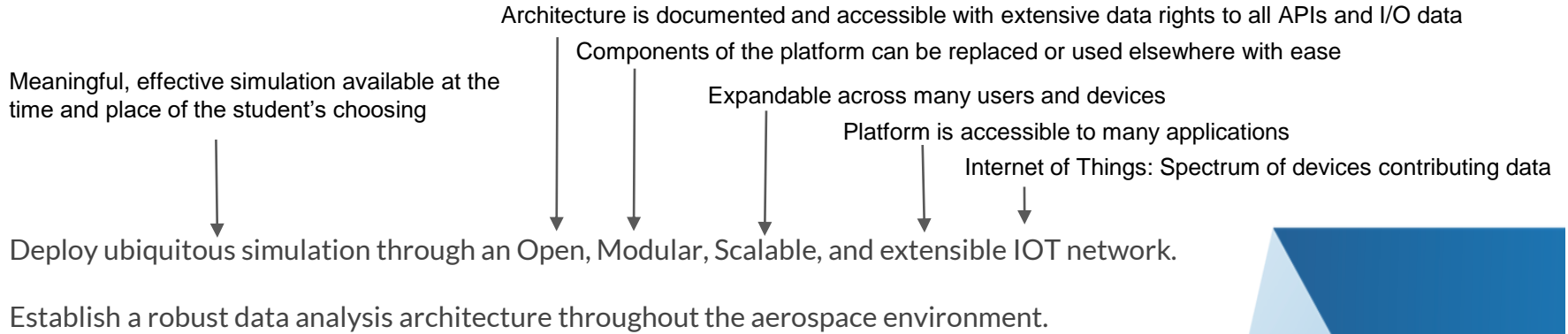
3 Meta Trends Revolutionizing Training

- XR Technologies and Commercial Gaming Engines:
    - Collapse the cost of meaningful simulation

- Scalable Computing (cloud):
    - Data easily shared and accessible
    - Computational limitations largely a thing of the past

- Machine Learning and Artificial Intelligence:
    - Surface key insights
    - Reduce instructor burden
    - Analyze student, instructor and systemic performance

Goal

Architecture is documented and accessible with extensive data rights to all APIs and I/O data

Components of the platform can be replaced or used elsewhere with ease

Meaningful, effective simulation available at the time and place of the student's choosing

Expandable across many users and devices

Platform is accessible to many applications

Internet of Things: Spectrum of devices contributing data

Deploy ubiquitous simulation through an Open, Modular, Scalable, and extensible IOT network.

Establish a robust data analysis architecture throughout the aerospace environment.
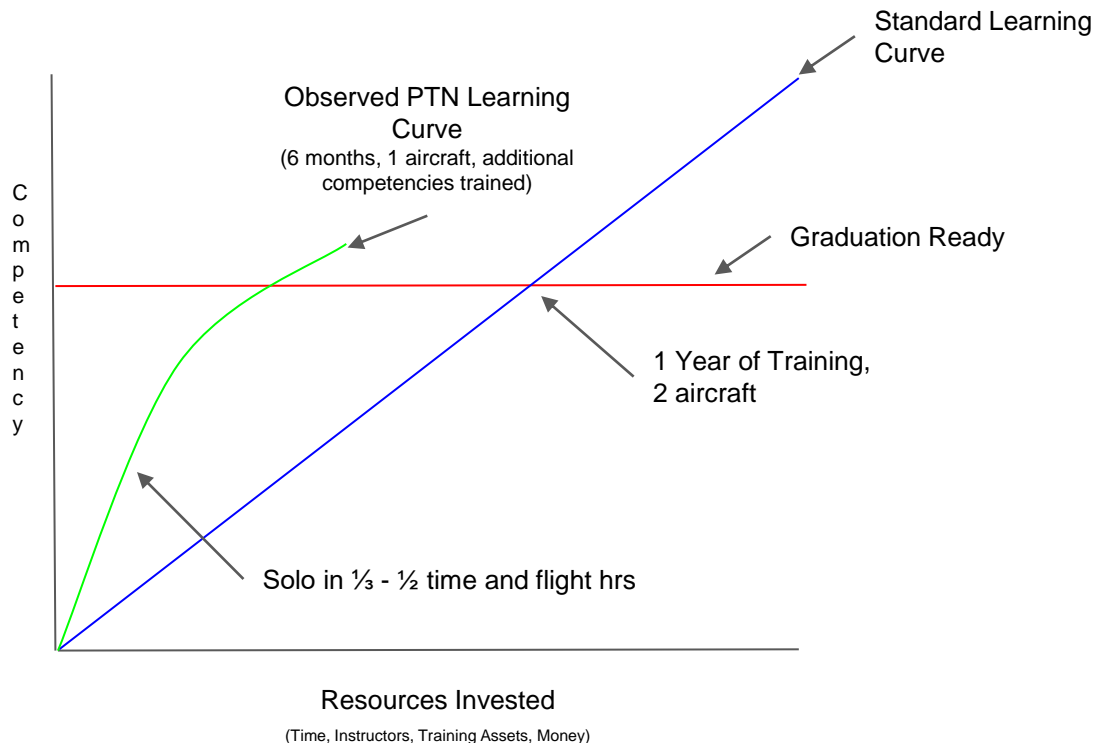
Problem Overview

Challenge:
- USAF pilot production is 80% of requirement and unscalable
- Chronic retention issues have eroded experience of the force
- Pilot training remains set on industrial, time-based model (hrs flown=quality)

Opportunity:
- Leverage proven adult learning techniques
- Modernize training tools

Future Growth:
- Open, extensible system
- Detailed tracking of student, instructor performance
- Data architecture to advance learning science

Standard Learning Curve

Observed PTN Learning Curve
(6 months, 1 aircraft, additional competencies trained)

Graduation Ready

1 Year of Training, 2 aircraft

Solo in ⅓ - ½ time and flight hrs

Competency

Resources Invested
(Time, Instructors, Training Assets, Money)

Joint Immersive Training System

An Immersive Environment for Military Aviation Training

Program Objectives

- **Scalable, production-ready solution for UPT 2.5**
- **Establish common architecture for future efforts**

Industry Partners:

- **Vertex Solutions --** Hardware, software, logistics
- **Google --** Scalable computing infrastructure, ATO
- **CAE --** LMS, competency mapping, adaptive syllabus
- **Discovery Machine --** Autonomous Flight Instructo

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