Technology Innovation & TXT Development in Aerospace & Aviation

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Milan, April 19th 2018

Mission & Markets

> TXT e-solutions is an international, specialized provider of engineering software solutions supporting customers in high-tech markets in their mission- and business-critical core processes and throughout their product lifecycles.

Aerospace & Aviation

Product development, customer engineering, manufacturing and aircraft operations

Automotive & Transport

On-board software and systems
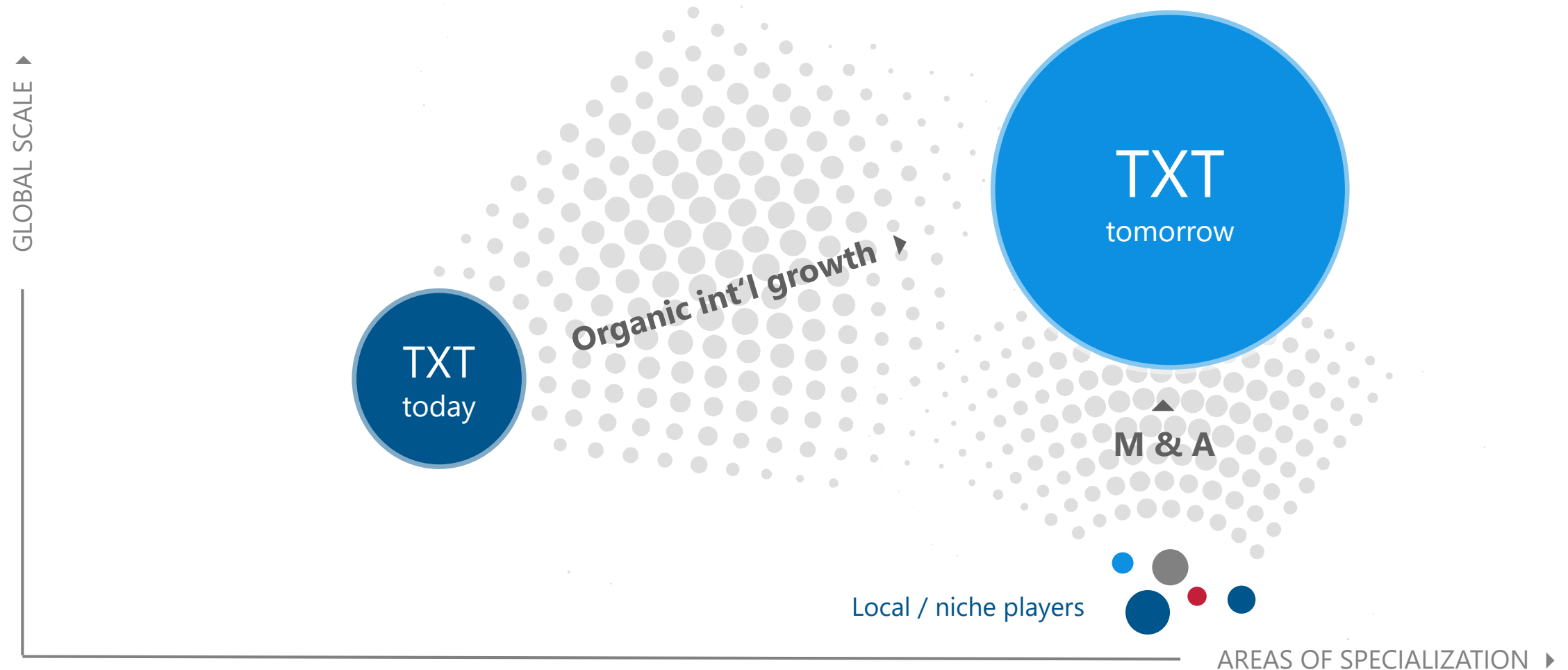
Banking & Finance

Independent testing, verification and validation of core applications and software quality services

Company Vision – Where We Are Headed

TXT

Specialization in **multiple high-value areas** across our target industries value chain, and ability to serve customers locally, yet on a global scale

GLOBAL SCALE

TXT today

Organic int'l growth

TXT tomorrow

M & A

Local / niche players

AREAS OF SPECIALIZATION

Aircraft OEMs

- AIRBUS
- BOEING
- COMAC
- EMBRAER
- LEONARDO
- ATR
- BOMBARDIER
- Eurofighter Typhoon
- MITSUBISHI AIRCRAFT CORPORATION
- SAAB TECHNOLOGIES
- SUKHOI
- Fokker
- GKN AEROSPACE
- superjet INTERNATIONAL — An Alenia Aermacchi and Sukhoi Company
- BAE SYSTEMS
- PILATUS
- IRKUT ИРКУТ

1st Tier Suppliers & MRO Providers

- SAFRAN AEROSPACE · DEFENCE · SECURITY
- Rolls-Royce
- REISER SIMULATION · TRAINING
- AIRFRANCE INDUSTRIES / KLM Engineering & Maintenance
- LEONARDO
- LIEBHERR
- GE Aviation
- Avio Aero — A GE Aviation Business
- TURKISH TECHNIC
- AVIAGE SYSTEMS — A GE AND AVIC PARTNERSHIP
- Secondo Mona
- UTC Aerospace Systems
- SR Technics
- RECARO
- Innovint AIRCRAFT INTERIOR
- PAUSTIAN AIRTEX
- Ui Expert Interior Solutions
- ROAND TECHNO

Fleet Operators, Lessors & Consultants

- Lufthansa
- DELTA
- ETIHAD AIRWAYS ABU DHABI
- Emirates
- HAWAIIAN AIRLINES
- QATAR AIRWAYS
- CATHAY PACIFIC
- FINNAIR
- brussels airlines
- Lufthansa CityLine
- GE Capital Aviation Services
- AERCAP
- NETJETS
- BOC AVIATION
- SWISS
- Austrian
- AirDolomiti
- ICELANDAIR
- Lufthansa Consulting
- AVITAS
- MDA
- EXPRESSJET
- ARMÉE DE L'AIR
- Air transat

Deep Engineering Knowledge Across The Aircraft Lifecycle & Value Chain

TXT

Preliminary Design & Evaluation	On-board Software	Product Configuration	Digital Manufacturing	Training & Simulation	Flight Operations

Product Development	Customer Engineering & Manufacturing	Aircraft Operations

- **Breadth** and **Depth**: focus on high-value niches, but understand the whole picture
- **Industry** and **Technology** expertise: **Engineering Services**, backed by **Software Assets**
- **Flexible** engagements models, with **turn-key engagements** weighting ¾ of total

Virtual & Augmented Reality in Aerospace & Aviation

From advanced training applications to innovation in aircraft's cabin configuration

Pacelab WEAVR

New Platform for rapid development & deployment of **Virtual Training** and **Operations Support** applications

Pacelab Cabin

Evolution of existing **product capabilities** with real-time Augmented Reality visualization

Virtual Training and Operation Support

DIGITAL TRANSFORMATION

From training manuals to interactive learning environments

"... a trusted and highly know-ledgeable partner in the software development for training systems."

ALBERTO CERIOTTI

Former Head of Training and Helicopter Support Systems, AgustaWestland

EASA - NPA 2014-22

"... it appears that any of the following training tools, or any combination of them, may be used: [,..] virtual reality; augmented reality; [...]."

PACELAB WEAVR, THE DIGITAL TRANSFORMERS

Designed according to EASA standards for Maintenance Training & Maintenance Operations

(Part 147 & Part 145)

Virtual Training Solutions | One Set Of Technical Data, Many Applications

Riding the **DIGITAL TRANSFORMATION** of Aerospace: get the most out of your most valuable assets and turn your **technical** and **procedural** knowledge into state-of-the-art **virtual training** and **operations support solutions**

DIGITAL TRANSFORMATION
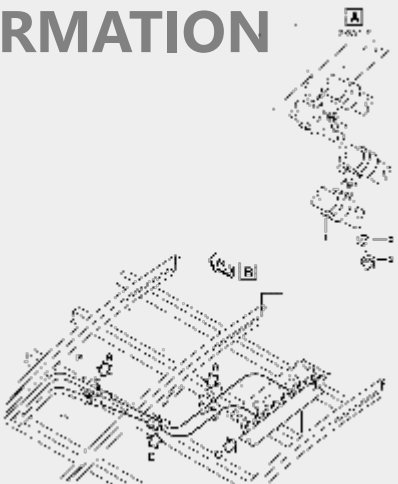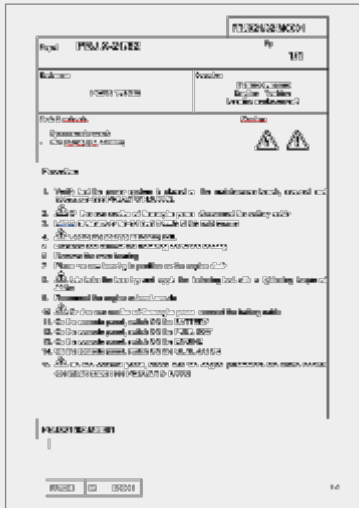
3D models
Technical publications
Troubleshooting procedures
Systems descriptions

TRAINING

OPERATIONS

VR & AR solutions
Training real-world scenarios in zero-risk environments

AR & VR solutions
On-the-spot, on-the job support for technicians

Pacelab WEAVR

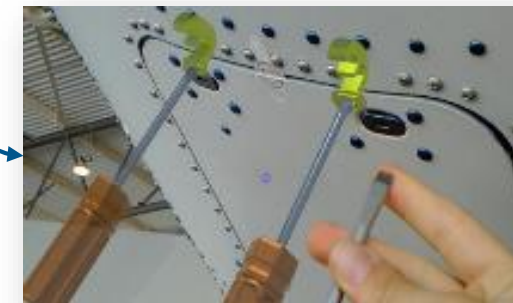Write once, **LEARN** everywhere

Running on — unity

Write once, **ACT** everywhere

Cloud

Virtual Learning (PCs, Tablets, Smartphones)

TXT
iOS

Immersive "Learn by doing" (VR wearable devices)

VR
VIVE   oculus

AR
AR

Hololens   Smart-glasses

Training on the job and Operations support
(AR-enabledTablets & Smartphones; wearable devices)

B
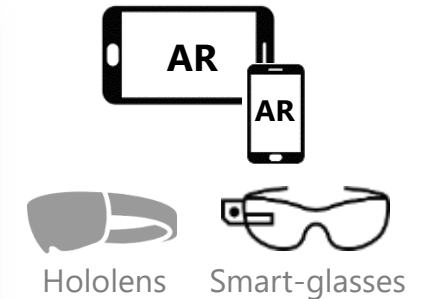
From Virtual Learning, to Training on the Job, to Operations Support

**PC/Tablet Computer-based Training:
non-immersive Virtual Training**

Immersive Virtual Reality

**Training on the Job & Operations Support
with Augmented (Mixed) Reality**

Leveraging Hololens & Mixed Reality in Aircraft Cabin Configuration

The Airbus and Boeing Use Cases

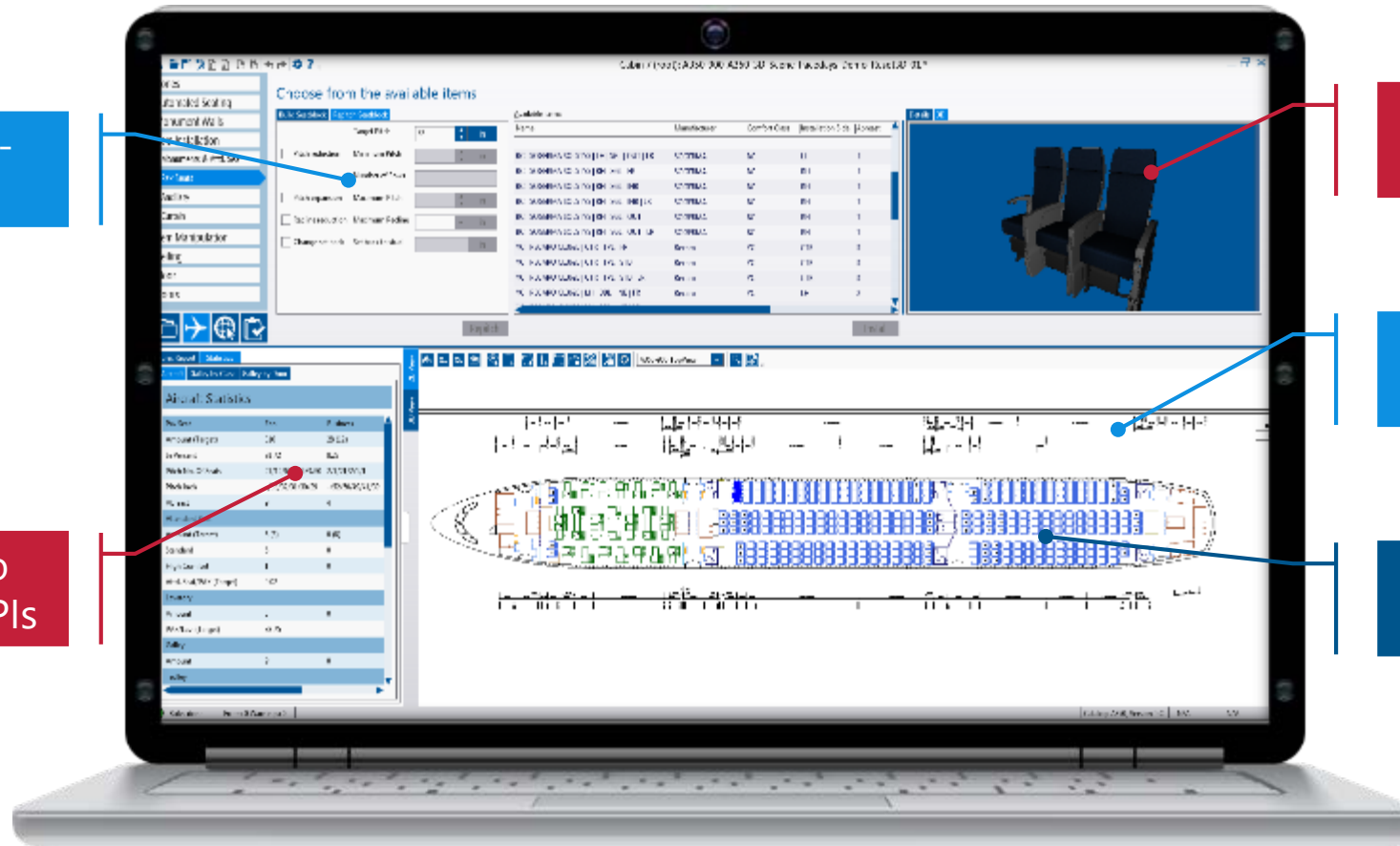| AIRCRAFT OEMs | AIRLINES | CONSULTANTS |

Introduction to Pacelab Cabin

Support catalog-based selection

Visual support for selecting options

LOPA optimization & drawing generation

Instant access to key statistics & KPIs
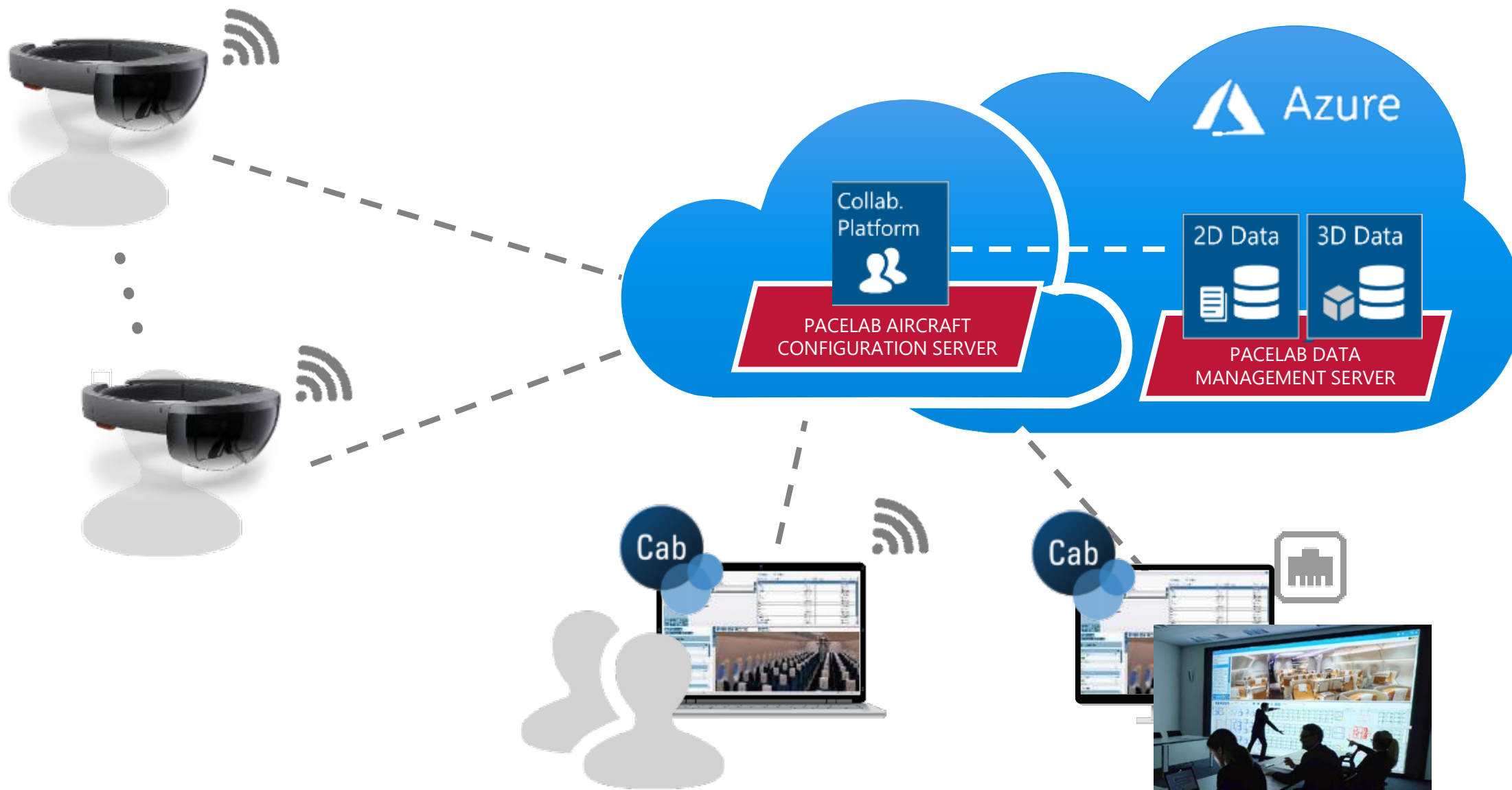
Rules engine based check & validation

Installed in the
A350 XWB Customer Definition Centre
in Hamburg for a life-size display of the cabin

Desktop Size Collaboration

Pacelab Cabin | Mixed Reality Aircraft Configuration & Collaboration

1 VIRTUAL INTERACTIVE ELEMENT (LUGGAGE COMPARTMENTS)

2 PHYSICAL MOCK-UP

3 VIRTUAL INTERACTIVE ELEMENT (PASSENGER SEATS)

REALTIME UPDATE FROM PACELAB CABIN

Mixed Reality Collaboration

Boeing Use Case

Airbus Use Case

Aircraft EXPO interiors

– Hamburg, Germany

– April 10-12

ZAL Zentrum für Angewandte Luftfahrtforschung

– Hamburg, Germany

– April 13

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