AREA

Augmented Reality for Enterprise Alliance

Augmented Reality for Enterprise Alliance

Step-by-Step Guide to Defining an Enterprise AR Use Case

Introduction

Defining Enterprise AR Use Cases

The AREA and its members are developing high-quality content that form the basis of a more precise and fruitful dialogue around AR.

- Enterprise Augmented Reality (AR) is a technology and industry filled with hype, the AREA seeks to provide factual, neutral and relevant information about the tools available, application possibilities, methods of implementation and return on investment.
- The first and most important step for Enterprise is to clearly define and create a shared agreement of the **business problem** (use case) AR will solve.
- This presentation, with supporting documents, provides a step-by-step guide to creating an AR Use Case, including all the content and supporting information.
- The AREA AR Use Case Template can be developed by an individual, but the AREA recommends co-creation by a cross functional team to ensure all viewpoints are considered.

Objectives

Defining Enterprise AR Use Cases

1. Define and refine an enterprise AR Use Case (and requirements) of interest to you / your company ***in a structured manner***

2. Ensure you have considered and captured all relevant details pertaining to the AR Use Case

3. Use the framework to share the detailed AR Use Case internally (and if required) externally to gain feedback and signoff

4. Utilize the framework and definition to support business case and internal justification to invest in AR

Enterprises…

Some of the current challenges…

- Unable to find vendor-neutral information
- No place to register AR-related needs (to a number of suppliers)
- Difficult to see what's gone before (e.g. RFPs, etc.)
- Difficult to plan implementation roadmaps

Providers…

Some of the current challenges…

- Difficult to access AR-ready customers
- Lack of awareness of other opportunities within the AR sector
- **Limited understanding of customer requirements**

Why is it important to solve real business problems?

Defining Enterprise AR Use Cases

1. Ensure Return on Investment

2. Easier to measure value

3. Helps prioritising features for system selection

4. Use Cases can be written in business language that all stakeholders can understand

Check out this video
What is a AR Use Case
and why is it important?

Typical use case definition…

Defining Enterprise AR Use Cases

Inspection (Medical)
Description
AR-assisted inspection systems display relevant medical & dental records on demand by health care workers and overlays digital information on the patient for evaluation and decision support.
AR Technologies
AR-assisted medical inspection uses any technology for authoring, detection, recognition and rendering. Display options for AR-assisted medical inspection that permit the professional to use both hands are highly preferred. The user interface for AR-assisted medical inspection can be speech recognition, gesture recognition, eye-gaze recognition or touchscreen.
Integration of AR-assisted medical inspection with patient record management technologies and systems is highly desirable.
Advanced medical inspection systems using Augmented Reality can support the professional in unfamiliar procedures or cases with remote expert interaction and feedback with integrated video conferencing and collaboration tools.
Benefits
•Rapid and consistent access by all medical and healthcare professionals to most current records, instructions, policies or modules
•Reduced risk of delays in evaluating conditions due to lack of familiarity
•Increased safety for healthcare professionals when performing their tasks
•Reduced risk of errors in evaluation, inspection and diagnosis
•Capture conditions of patient at the time of inspection and stores the data in the patient record
Organizations
Health care organizations operating in hospitals, private clinics, and other health care facilities.
Users
Health care professionals.
Examples
•Display of medical records for patient screening by emergency medical technicians
•Real time diagnostic or clinical inspection with nurses and physicians concurrently focusing on the same patient while pointing to regions or structures of interest
•Generation of ultrasound images of tumors by medical technicians with a scanner and conversion into 3D for viewing on an AR-enabled device as part of pre-surgery evaluation

Commentary

- Numerous **use cases** have been defined

But…

- They are high level
- Not linked to any other artefacts (case studies, etc.)
- No linkage to commercial offerings
- No connection to detailed requirements

- "How do I make this use case refer to my **precise need**?"
- "How do I **develop a solution** for this use case?"
- "How can I confirm that my solution **supports this use case** end to end?"

- ***Not actionable***

Using the Template

Defining Enterprise AR Use Cases

Link to Template

AREA AR Use Case Template

Overview of use case
Provide a provide a brief description of the use case

What is the industry to which the use case applies?
Select all that apply.

- Architecture, Construction and Engineering
- Automotive
- Aviation and Aerospace
- Chemical
- Emergency Response
- Education
- Farming
- Government
- Industrial Equipment
- Logistics
- Manufacturing
- Marine
- Medical
- Metals & Mining
- Oil & Gas
- Power & Energy
- Smart Cities
- Telecommunications
- Transportation
- Utilities

What is the 'setting'?
Where does this use case take place?

- Engineering Development
- User operations
- Factory
- Sales & Marketing
- Field operations

Problem statement
What are the problems/risks/challenges that this use case seeks to address?

Current Process *(optional)*
Provide a clear and concise description how this task is performed today (describe what skills and/or tools are needed and the complexity/duration of the task).

AR-enabled Process
Provide a clear and concise description how would this task be performed with the use of AR.

Benefits from use of AR
How is the task improved or the problems mitigated with the use of AR?

Digital assets
What digital data is required for or assists this use case (e.g. 3D models, drawings, documents)

Environment
Describe the physical objects (machines, buildings, etc.)

Personas
What are the human roles in this use case? (e.g. "Field Service Technician")

Stakeholders
Who has a vested interest in the successful adoption of this use case? (e.g. VP of Engineering)

External Links or Examples
Please provide public links or examples of this use case.

Requirements

Please list the requirements needed to support this use case. Consider needs such as:

- Security
- Safety
- Authoring
- Privacy
- System integration
- Content re-use and delivery
- IoT
- Navigation
- Navigation
- User interaction
- Data presentation
- Digital UI
- Device needs
- Performance
- Automation
- Data needs
- Digital twin

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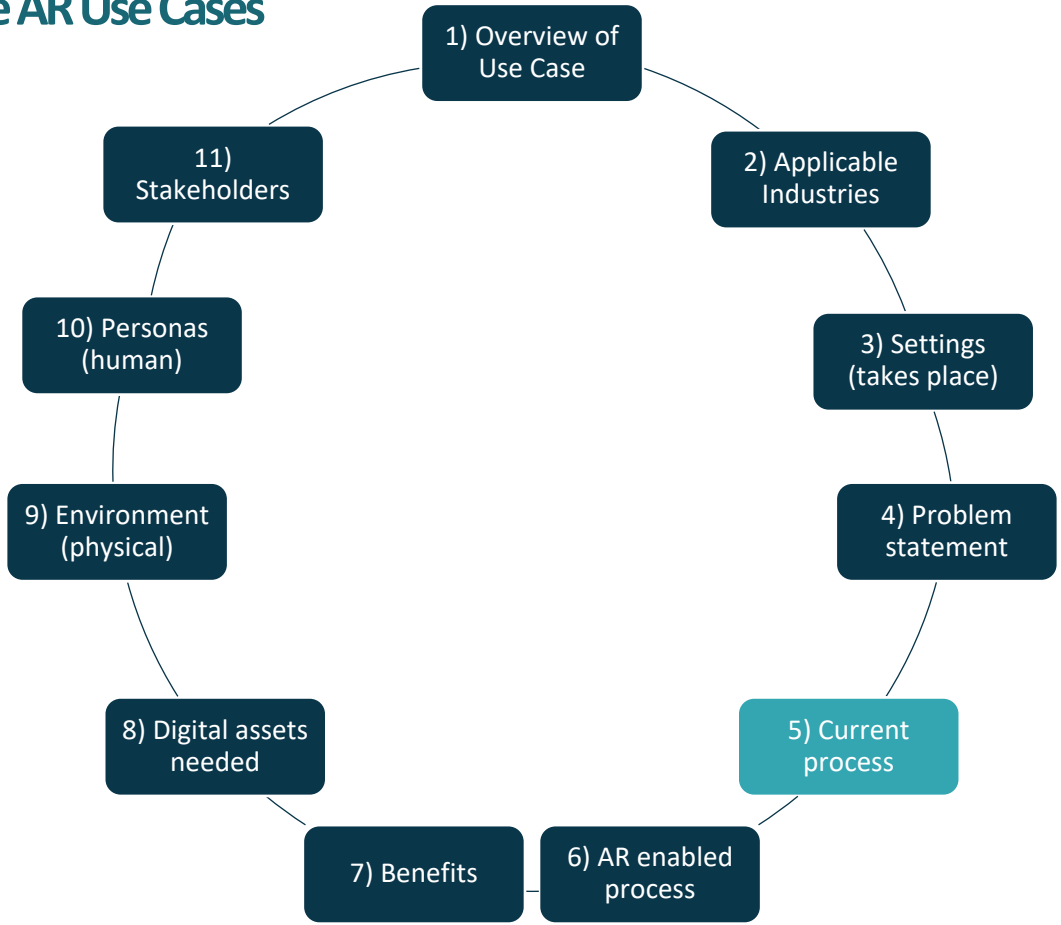
Defining Enterprise AR Use Cases



Current AR Use Cases

Defining Enterprise AR Use Cases

Assembly	Collaboration	Guidance
Inspection	Maintenance	Navigation
Remote Assistance	Simulation	Situational Awareness
Training / Education	Marketing and Sales	Visualization
Virtual User Interface		

Industries

- Architecture, Construction and Engineering
- Automotive
- Aviation and Aerospace
- Chemical
- Emergency Response
- Education
- Farming
- Government
- Industrial Equipment
- Logistics
- Manufacturing
- Marine
- Medical
- Metals & Mining
- Oil & Gas
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- Smart Cities
- Telecommunications
- Transportation
- Utilities

Settings

Engineering development

- Prototype development
- Design
- Test

Factory

- Manufacturing processes
- Factory operations

Field operations

- Field service and repair
- Maintenance
- Diagnostics

User operations

- Interactive user instructions
- Consumer diagnostics
- Virtual operation and interaction

Warehousing and Logistics

Sales and marketing

- Prospect presentations
- Marketing promotions

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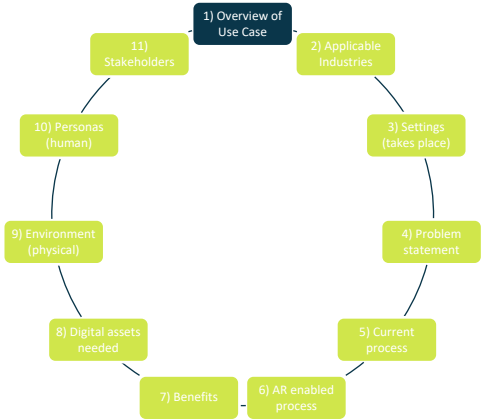
Defining Enterprise AR Use Cases

1) Overview of Use Case

Overview of use case

Provide a provide a brief description of the use case – see AREA Use Case Template - for high level AREA description



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Defining Enterprise AR Use Cases

What is the industry to which the use case applies?

2) Applicable industries

Tick each relevant Enterprise

Architecture, Construction and Engineering		***Government***		***Oil & Gas***	
Automotive		***Industrial Equipment***		***Power & Energy***	
Aviation and Aerospace		***Logistics***		***Smart Cities***	
Chemical		***Manufacturing***		***Telecommunications***	
Emergency Response		***Marine***		***Transportation***	
Education		***Medical***		***Utilities***	
Farming		***Metals & Mining***		***Other***	

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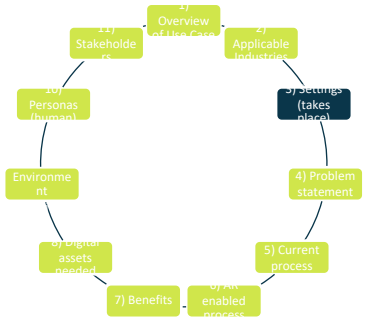
Defining Enterprise AR Use Cases

What is the setting?

Where does this Use Case take place?

3) Settings



	Tick all relevant
Engineering Development / design	
Factory	
Field operations	
User operations	
Sales & Marketing	
Other	

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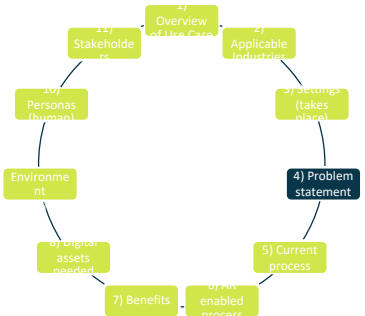
Defining Enterprise AR Use Cases

4) Problem Statement

Problem statement

What are the problems/risks/challenges that this use case seeks to address?



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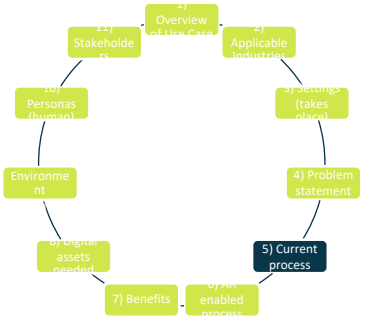
Defining Enterprise AR Use Cases

5) Current process

Current process

Specific to your company / industry



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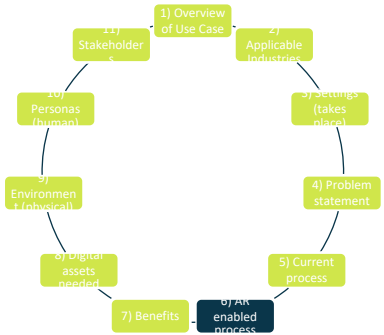
Defining Enterprise AR Use Cases

6) AR enabled process

AR-enabled process

Provide a clear and concise description how would this task be performed with the use of AR



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Defining Enterprise AR Use Cases

7) Benefits

Benefits from use of AR

How is the task improved or the problems mitigated with the use of AR?

AREA RoI Calculator

https://thearea.org/roi-calculator-tool-2/

- Contextually-Anchored Data Visualization
- Reduced Need for Experts in Field
- Increased Human Performance
- Reliable and Immediate Decision Support
- Streamline Business Operations (Reduction of Resource Usage to Complete Tasks)
- Higher Flexibility of Human Resource Usage
- Consistent Quality with Lower Effort
- Error Reduction
- Waste Reduction
- Risk Reduction
- Increase in Training Efficacy
- Increased Compliance
- Superior Standard Operational Procedures
- Increased Awareness (and Reduction) of Workplace Stress
- Increased Worker Satisfaction

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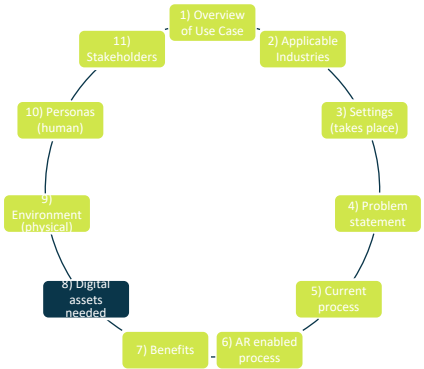
Defining Enterprise AR Use Cases

8) Digital assets needed

Digital assets

What digital data is required for or assists this use case (e.g. 3D models, drawings, documents)



AREA research into 3D Assets

https://thearea.org/area-research/research-reports-and-case-studies/

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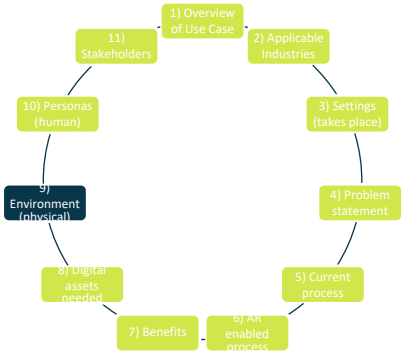
Defining Enterprise AR Use Cases

9) Environment

Environment

Describe the physical objects (machines, buildings, etc.)



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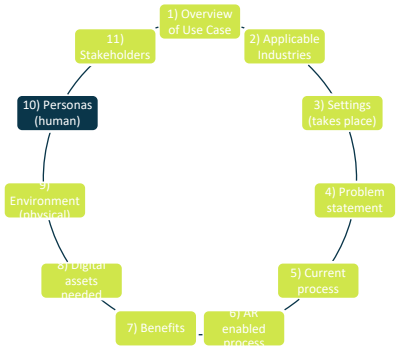
Defining Enterprise AR Use Cases

10) Personas

Personas

What are the human roles in this use case? (e.g. "Field Service Technician")



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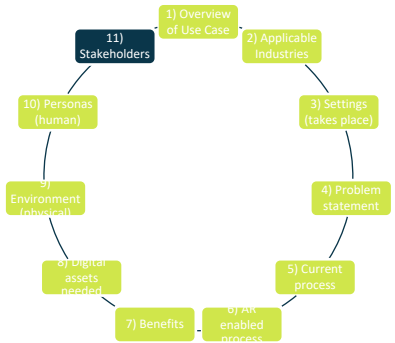
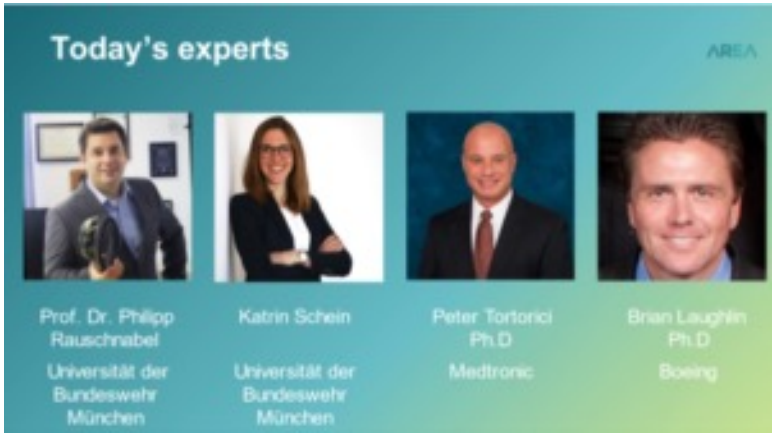
Defining Enterprise AR Use Cases

11) Stakeholders

Stakeholders

Who has a vested interest in the successful adoption of this use case? (e.g. VP of Engineering, CIO, CTO etc)





Click on image to watch recording

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Defining Enterprise AR Use Cases

Requirements

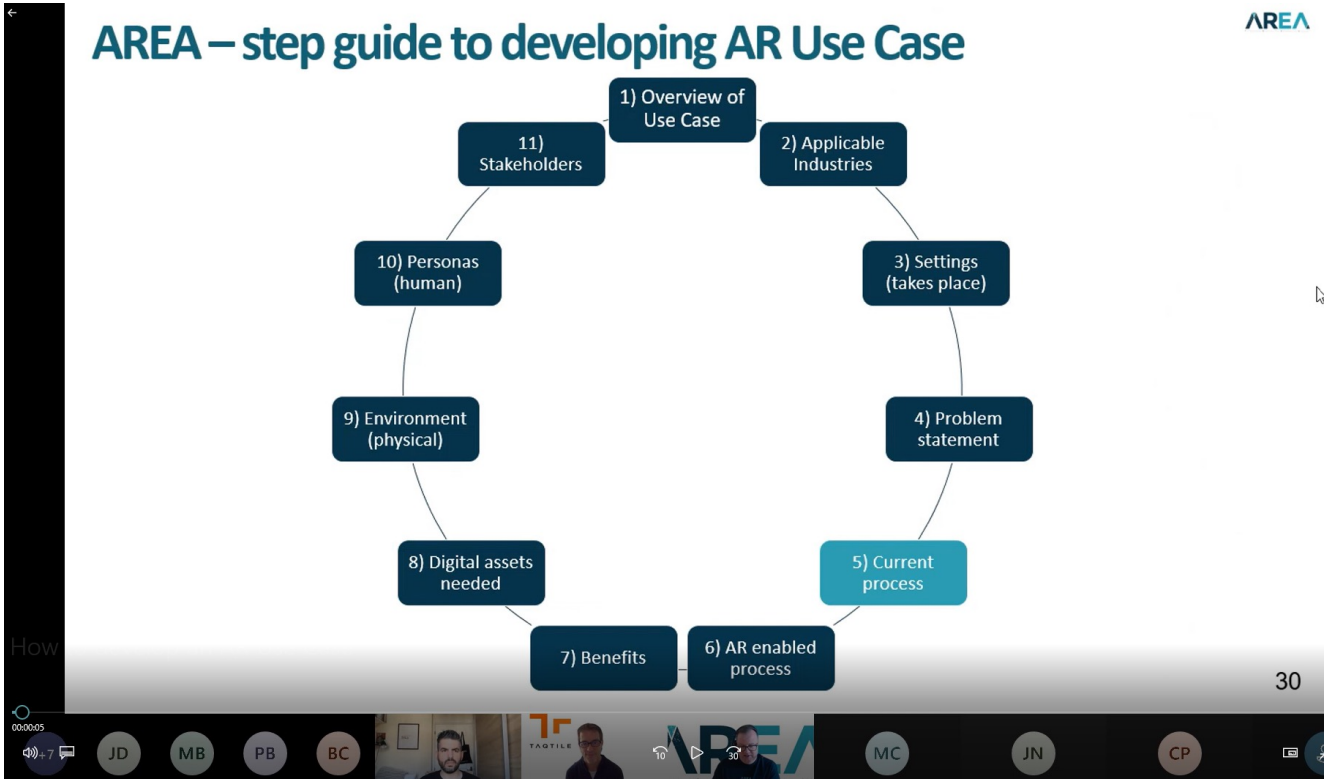
- Please list the requirements needed to support this use case. Consider needs such as:

Tick each relevant requirement

Security		***Safety***		***Authoring***		***Privacy***	
System integration		***Content re-use and delivery***		***IoT integration***		***Navigation***	
User Interaction		***Data presentation***		***Digital UI***		***Device needs***	
Performance		***Automation***		***Data needs***		***Digital twin***	

AREA – How to Develop an AR Use Case - Video Overview

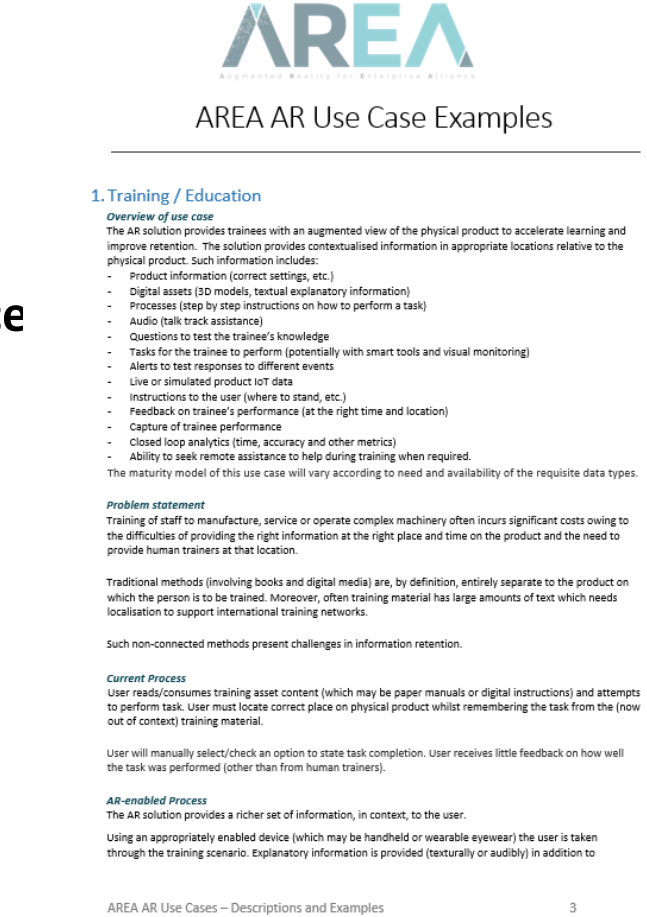
Defining Enterprise AR Use Cases



Example Use Cases

Defining Enterprise AR Use Cases

1. AR for Training
2. AR for Inspection and Quality Assurance
3. AR for Complex Assembly
4. AR for Remote Assistance
5. Virtual User Interfaces with AR



AREA AR Use Case Examples

1. Training / Education

Overview of use case

The AR solution provides trainees with an augmented view of the physical product to accelerate learning and improve retention. The solution provides contextualised information in appropriate locations relative to the physical product. Such information includes:

- Product information (correct settings, etc.)
- Digital assets (3D models, textual explanatory information)
- Processes (step by step instructions on how to perform a task)
- Audio (talk track assistance)
- Questions to test the trainee's knowledge
- Tasks for the trainee to perform (potentially with smart tools and visual monitoring)
- Alerts to test responses to different events
- Live or simulated product IoT data
- Instructions to the user (where to stand, etc.)
- Feedback on trainee's performance (at the right time and location)
- Capture of trainee performance
- Closed loop analytics (time, accuracy and other metrics)
- Ability to seek remote assistance to help during training when required.

The maturity model of this use case will vary according to need and availability of the requisite data types.

Problem statement

Training of staff to manufacture, service or operate complex machinery often incurs significant costs owing to the difficulties of providing the right information at the right place and time on the product and the need to provide human trainers at that location.

Traditional methods (involving books and digital media) are, by definition, entirely separate to the product on which the person is to be trained. Moreover, often training material has large amounts of text which needs localisation to support international training networks.

Such non-connected methods present challenges in information retention.

Current Process

User reads/consumes training asset content (which may be paper manuals or digital instructions) and attempts to perform task. User must locate correct place on physical product whilst remembering the task from the (now out of context) training material.

User will manually select/check an option to state task completion. User receives little feedback on how well the task was performed (other than from human trainers).

AR-enabled Process

The AR solution provides a richer set of information, in context, to the user.

Using an appropriately enabled device (which may be handheld or wearable eyewear) the user is taken through the training scenario. Explanatory information is provided (texturally or audibly) in addition to

AREA AR Use Cases – Descriptions and Examples 3

Other use case ideas

Defining Enterprise AR Use Cases

1. AR for Design reviews
2. AR for Factory layout
3. AR for Sales Demonstrations
4. AR for Service Procedures
5. AR for Factory Operations
6. AR for User Manual
7. AR for XYZ? – choose your own use case…

Suggestions / Tips

Defining Enterprise AR Use Cases

Consider this from the point of view of the Enterprise customer deploying AR. What are the requirements from end to end in order to implement the use case?

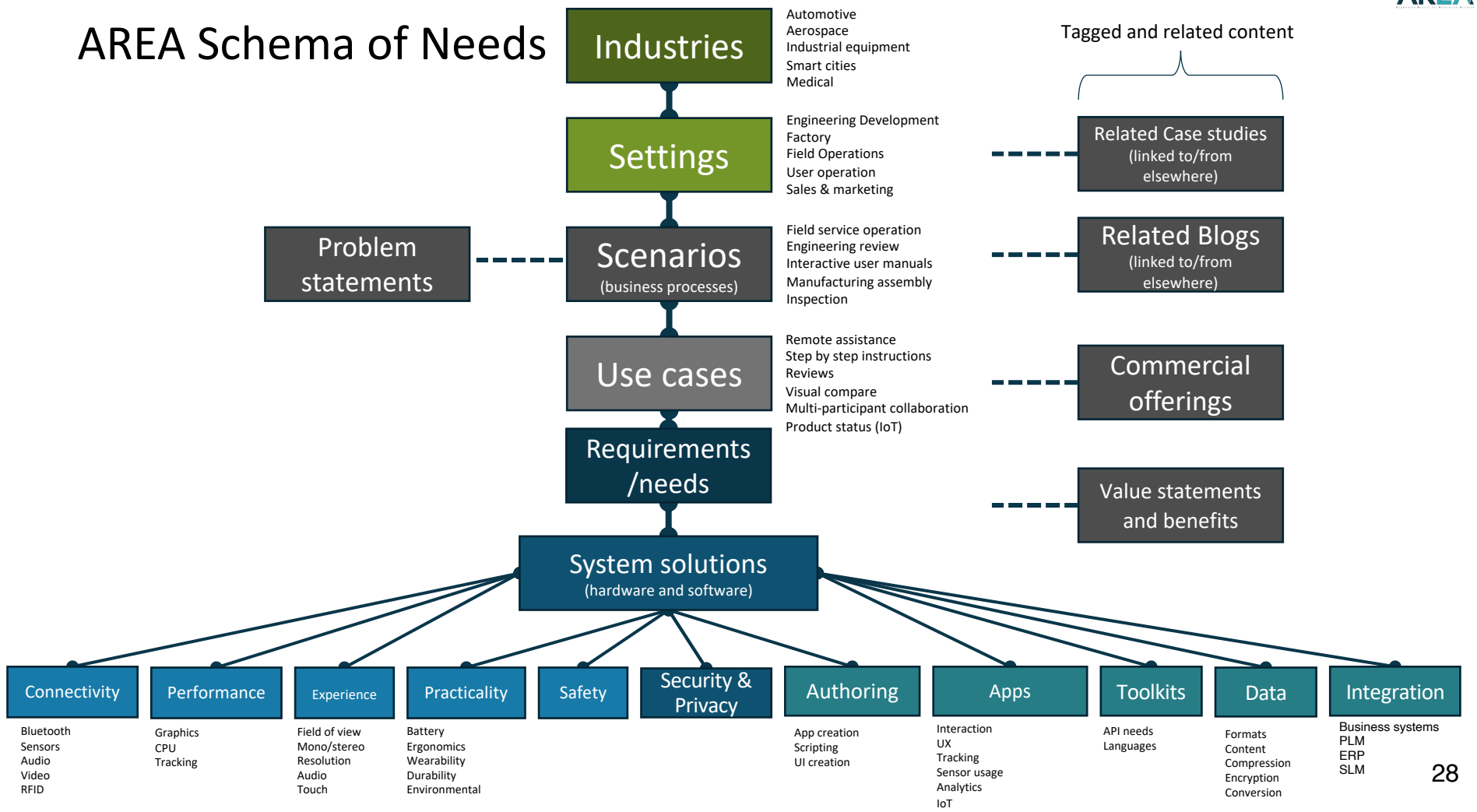
What are the personas involved in the scenario?

- Service technician, engineer, machine operator, inspection technician, etc.?

Consider needs such as :

- Security
- Safety
- Authoring
- Privacy
- System integration
- Content re-use and delivery
- IoT
- Navigation
- Digital twin
- Navigation
- User interaction
- Data presentation
- Digital UI
- Device needs
- Performance
- Automation
- Data needs

AREA Schema of Needs



Use Case Maturity Model - Field Service Technician Procedure

Defining Enterprise AR Use Cases

Level 3 – Fully closed loop and smart

Use of predictive and field analytics
Smart diagnostics tools
Richer fusion of inputs to create "smart" dynamic instructions

Level 2 – Richer information and interaction

IoT display enabled
Interactive 2-way screen annotations
Animated 3D instructions

Level 1 – Connected app

Live product data and history from business systems
Online submission of results
Simple screen sharing of view with SME
Simple use of 3D to enhance understanding

Level 0 – Standalone

Offline operation
In-screen '2D' instructions

A scenario-based mini-roadmap for adoption

Required maturity may be influenced by industry, funding, etc.

Next Steps

Interested in the AREA?

- Learn more about the AREA at thearea.org
- Contact Mark Sage **mark@thearea.org**

Interested in getting involved in AR use cases and requirements?

- Watch the Requirement Committee intro movie