

Digitizing in Research and Teaching

Annual AIM Conference, Berlin 2020

Agenda

- 1) Motivation
- 2) AR for Operator support
- 3) VR for teaching of lean
- 4) Summary



Corona Crisis

■ Challenges

- Lockdown of most business
- Restricted travel
- Challenging to get experts & students on-site

■ Motivation

Bring manufacturing site closer to experts / students, in remote location

■ Method

Use modern AR & VR tools to bring teaching and operators in contact with operations

Example 1: AR for context sensitive, handsfree on-site support

Example 2: VR tools to provide immersed experience in teaching of lean

Share insights with AIM

1. Support workers in complex tasks



*"Is this shipment correctly loaded?
Is there a damage?"*



*"Where do I find the M 24
bolts?"*



*"How to get help with this
error code?"*



*"How to assemble this
complex module ?"*

Requires immediate access to specific information

- Context specific to situation of operator
- Handsfree = Gesture controlled

1.1 Application Demo

Support of complex assembly operations



STEP 2: Zusammenbau

STEP 2

Verschraube das Zahnrad mit der Nabe. Tipp: Schau Dir die 3D Animation auf deinem Arbeitsplatz an.

BACK NEXT

STEP 2 Verschraube das Zahnrad mit der Nabe. Zur Hilfe schaue die 3D Animation auf deinem Arbeitsplatz.

Animated description of each step (Video, 3D-Animation, Pictures)

Sw adaptive to context^a

handsfree

Cur integrated is

All videos: UL in cooperation with Dropslab Technologies GmbH



1.2 Application Demo

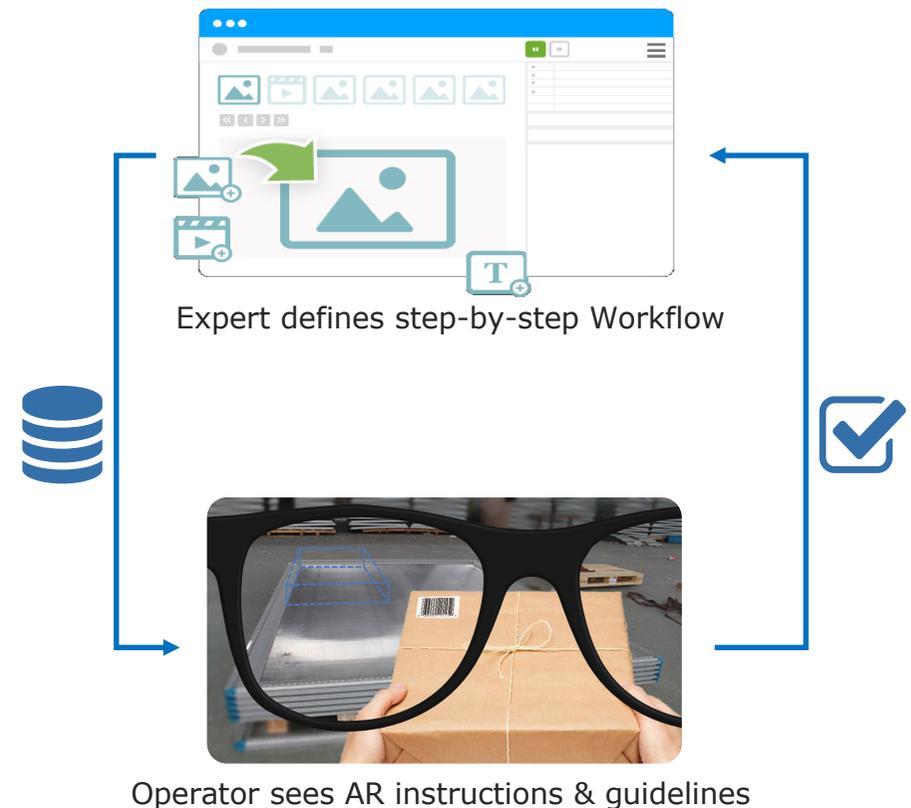
Support of logistics documentation

Key Features

- AR assistance for shipment information
- Cargo acceptance & documents validation
- Pallet build-up assistance

Benefits

- Reduce the errors & need in training
- Hands-free (higher efficiency)
- Elimination of “paper work”



1.2 Application Demo

Paperless and handsfree logistics documentation



All videos: UL in cooperation with Dropslab Technologies GmbH

1.2 Application Demo

AR assisted volume check



2. Teaching lean

Starting point

■ Issue:

Classroom teaching only communicates *some* aspects of learning scope

■ Examples:

Professor *talks* about manufacturing processes

Professor shares only *pictures* or videos via PPT

■ Disadvantages:

Students do not *experience* “real” industrial issues

They are not inside plant – no immersion



■ Before:

Operational Excellence Lab educates Master students in „Lean“ methods and tools

Hands-on experience in learning factory.

■ New:

In VR based lecture students “visit” real manufacturing plants

2.2 Teaching lean

Method: VR based on Youtube

Agenda

Purpose of this class

- Observe lean in manufacturing plants
- Requirements / VR Cardboards

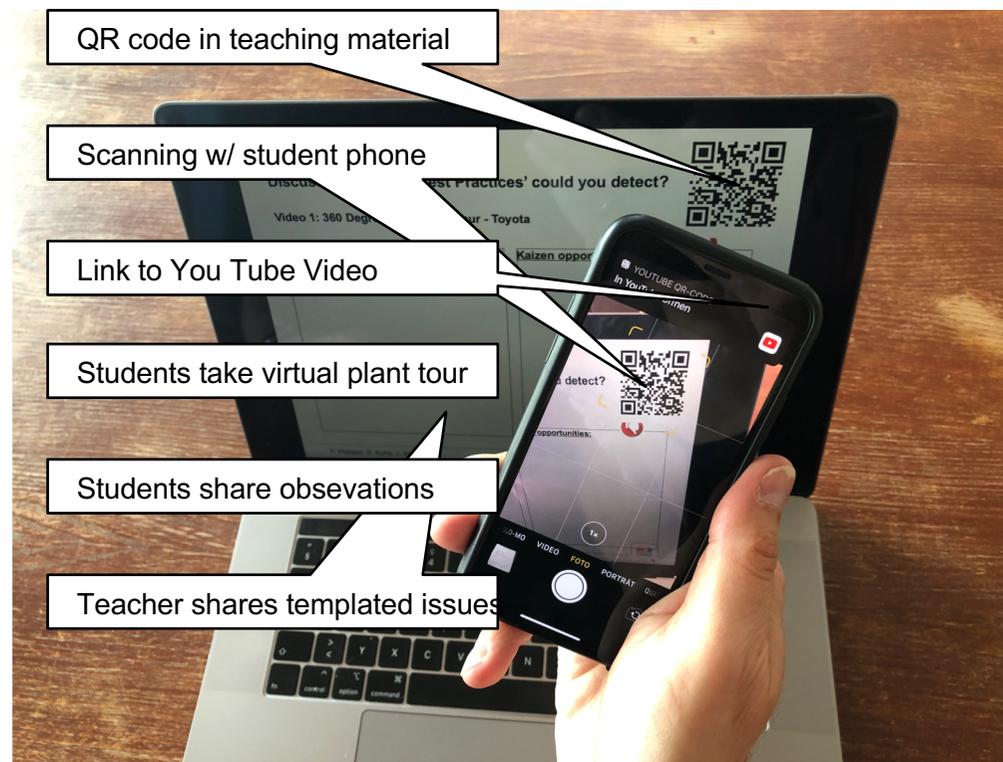
Introduction

- What do we mean by 'Best Practices'?
- Preparation

Discussion

- VR-tours:

- 1) Toyota
- 2) Tesla
- 3) Niftylift
- 4) Würth Elektronik
- 5) ABB



2. Virtual plant tour at TESLA plant in Master SPC



Immersion, 360 view, individual experience

Students' feedback:

- Excited
- „almost“ real
- Everyone observes other aspects
- better exchange than in “normal” class

Interested in course material?



Digitizing in Research and Teaching

■ VR for operator assistance

Handsfree

Bidirectional documentation support

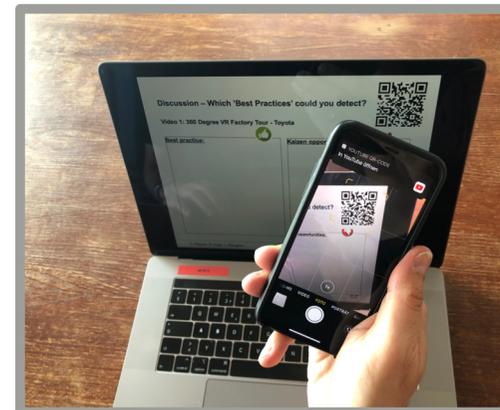
Context sensitive



■ AR for teaching lean

Immerse / better experience

Based on You tube



Thanks to funding agencies

