DHL GLOBAL TECHNOLOGY
CONFERENCE 2015

Breakout session: Augmented Reality in Logistics

Dubai, 16th April 2015
WHAT WILL HAPPEN IN THIS SESSION?

Agenda
1. Why Augmented Reality?
   Introduction of topic and purpose of discussion
2. What are some of the use cases for the logistics industry?
   • Overview of augmented reality @ DPDHL
   • Use cases Warehousing/Transport/Last Mile
3. Results of first AR pilot „pick by vision“ by Ricoh
   Set-up, results and next steps
4. Live demonstrations of “pick by vision” use cases
   • Live demo with Google and Vuzix Glasses
   • Showcase/video of potential future applications
5. Short voting activity!

Facilitators
• DHL: Dr. Markus Kückelhaus, Gina Chung
• Ricoh: Pieter-Jelle van Dijk
• Ubimax: Jan Junker
WHAT IS AUGMENTED REALITY?
WHY AUGMENTED REALITY?

DHL Logistics Trend Radar

Source: DHL Trend Research
**BEST PRACTICE CONSUMER APPLICATIONS**

**Live Demo**

Source: DHL, Wordlens
CURRENT AND UPCOMING DEVICES

- Vuzix M100
- Google Glass Explorer
- Epson Moverio BT-200
- META Spaceglasses 01
- Lumus DK-40
- Sony SmartEyeglass
- Knapp Kisoft Vision
- Omnivision OVP2200
- Recon Jet
- Si14 GlassUp
- Brother AirScouter
- Microsoft Hololens
AUGMENTED REALITY IN LOGISTICS

Trend Report launched at last year’s technology conference. First report of its kind focusing on 11 concrete use cases along the supply chain.

WHAT IS AUGMENTED REALITY?

- Augmented Warehouse
- Future of Transportation
- Last-mile: Future Postman
WHAT IS AUGMENTED REALITY?

Augmented Warehouse

Future of Transportation

Last-mile: Future Postman
1). AUGMENTED WAREHOUSE

Warehouse Operations:
Vision Picking, Packing & Sorting
- Warehouse staff are equipped with smart glasses that can barcode scan and assist with tasks to increase productivity and reduce errors

Value-Add: Assembly & Repair
- Assembly and repair teams are equipped with smart glasses that blends in visual step-by-step instructions for the task and identifies any quality issues to the worker

Source: DHL Trend Research
WHAT IS AUGMENTED REALITY?

AUGMENTED REALITY IN LOGISTICS

1. Augmented Warehouse
2. Future of Transportation
3. Last-mile: Future Postman
2). FUTURE OF TRANSPORTATION

Dynamic Traffic Support

- Replacement of navigation systems in delivery vehicles with AR. Critical information can be superimposed such as cargo temperature, surrounding threats, vehicle status.

Completeness Check

- AR devices register if a delivery is complete by capturing pallet and parcel numbers, volume and even check if there are any damages.

Source: DHL Trend Research
WHAT IS AUGMENTED REALITY?

Augmented Warehouse

Future of Transportation

Last-mile: Future Postman
WHAT IS AUGMENTED REALITY?

3). LAST-MILE: THE FUTURE POSTMAN

Parcel Loading & Drop-off
- Save time and improve parcel handling by using AR to optimize parcel loading, highlight the correct parcel in the van for drop-off and overlay parcels with information (fragile, weight etc.)

Last-meter Navigation
- AR to identify the correct building and entrance as well as indoor navigation. A learning system is able to add user-generated content to the AR map (e.g. A hidden entrance)

Source: DHL Trend Research
AUGMENTED REALITY ROADMAP AT DHL

Successive POCs using more advanced devices planned in 2015

**Ricoh Vision Picking, NL**

Goal: lighthouse productive pilot to test feasibility of vision picking using the Vuzix M100/Google Glass in a live operational environment

Key measure: productivity gain

Source: DHL Trend Research | *TBC

**Vision Sorting**

Goal: POC for commissioning process at the our sorting center using augmented reality smart glasses from Epson (still needs 1 year before ready for productive usage)

Key measure: error reduction

**Vision Picking, UK**

Goal: visionary POC to eliminate barcode scanning using Meta’s see through augmented reality glasses for vision picking. Meta glasses still need 2 to 3 years before ready for productive usage

Key measure: error reduction, documentation

Complexity
Ricoh Europe
Supply Chain Management

DHL Global Technology Conference 2015

Pieter-Jelle van Dijk,
Director Operations RESCM
Leader Global Team (Logistics)
Pieter-Jelle van Dijk  
Director Operations  
Leader Global Team Logistics  
Member of the European SCM Council  
Ricoh Europe SCM  
Tel: +31 164 280 620  
Mobile: +31 6 2158 3834  
Pieter-jelle.van.dijk@ricoh-europe.com

CONNECT

MY 2015 GOAL

Climbing the Aple d'Hues 6 times on 1 day

Raising funds for Cancer research.
KWF

17 Year in the logistics services industry

DHL

Now 6 Years with Ricoh

http://deelnemers.opgevenisgeenoptie.nl/acties/pieterjelle-vandijk/pieter-jelle-van-dijk/
**Project Summary**

**BACKGROUND**

- Joint initiative
  - Ricoh Europe SCM
  - DHL Supply Chain & DHL Trend Research
- 3 weeks pilot (December 2014)
- Trolley picking solution with Google Glass & Vuzix M100
- Using Ubimax’s software and server

**BENEFITS FROM VISION PICKING**

- Productivity increase from increased speed/pick
- Improvement of picking accuracy
- Satisfied and engaged employees
- Reduction in paper
- Reduction in trainings times and language dependency*

**SET-UP**

- 3 weeks of successful productive order picking
- Pick-by-vision used by 10 order pickers
- More than 9,000 orders fulfilled
- More than 20,000 items picked

*Prove that smart glasses can be used for order picking in a more cost effective manner than RF scanners and paper pick lists*

Source: DHL Trend Research,*not in scope of pilot
Current Picking Process

1. Select trolley
2. Scan Task
3. Go to Shelf
4. Scan location
5. Scan Item
6. Confirm quantity
7. Put all items into bins
8. Finish task

- Paper pick list displayed in a non-user friendly format
- More prone to error
- Errors arise from items that are single units
- E.g. picker takes 3 packaged boxes instead of 3 single units
- Time lost in putting the RF scanner back and forth away to scan and sort items.
- Up to 15 to 30 possible bins per trolley - each bin is linked to a customer order
- Errors and time lost from reading pick list to locate the right bins for items
- Smart glasses can scan login and task ID
- All task information integrated into user interface

- Smart glasses can barcode scan, has voice functionality to confirm all units picked
- Location scan was not include in the pilot (compensated in Time analysis)

- Trolley represented graphically
- Greatly increases efficiency for sorting products into bins

1. Select trolley
2. Scan Task
3. Go to Shelf
4. Scan Item
5. Confirm quantity
6. Put all items into bins
7. Finish task

Smart glasses display warning picture for items with this risk only
User Interface Explained

Progress
Aisle Number
Location
Quantity
Next Pick

Trolley

T06
010.2

3x

T07
022.1

1

2
Overview of Results

QUALITATIVE RESULTS
- User surveys show positive feedback with the exception of people with serious eye problems
- Areas for improvement – stronger scanning capability of the Google Glass, smart glass form factors, stable connectivity to server

USER FEEDBACK
- “Much easier and faster to operate”
- “Quick and error free”
- “Great to have hands free”
- “You barely feel it once you are wearing it”
- “Need to get used to it first, but easy afterwards”

QUANTITATIVE RESULTS

Source: DHL Trend Research
Conclusion and Next Steps

Smart glasses have relatively small investment and faster payback in comparison to other solutions such as full automation and pick-by-light.

However, a number of challenges needs to be addressed before vision picking can be seriously considered for implementation:

- **Hardware limitations:**
  - Smart glasses tested are consumer devices - not made for industrial usage
  - Hardware lifetime in productive environment relatively unknown due to newness
  - Battery life only 30min without ext. pack

- **Health and safety:** few studies on long-term effects of wearing monocular smart glasses. Concerns from workers councils.

- **IT support:** solution required if vision picking integrated into WMS

- **Legal:** data protection, devices potentially vulnerable to hacks
Wearable Computing Company

- European market leader for wearable computing solutions
- Experienced team with extensive track-record
- Senior advisory board consisting of wearable computing pioneers
- Strong partner network with industry market leaders
- Office locations in Bremen, Munich and Wiesbaden

Central Platform

Innovative Solutions

Satisfied Customers
Sorter takes one good from the conveyor belt and scans the item with the smart glasses. Based on marker cubes positioned above, smart glasses provides graphical Augmented Reality information of where to put the scanned good directly in the field of view of the worker, increasing accuracy.

Source: Ubimax GmbH
AUGMENTED REALITY IN THE FUTURE

Source: Ubimax GmbH
INTERACTIVE LIVE DEMO

1. DHL/Ricoh vision picking demo pilot using Google Glass and the Vuzix M100 smart glasses

2. Vision sorting demo using the Epson Moverio smart glasses

3. “3D Packer” pallet-building demo using Google Glass
Please vote for the top three use cases and leave your business card if you would like to be contacted for further discussions!

Guidelines
- One your way out, please vote for the three use cases that you see have the highest feasibility and impact in the supply chain.
- Use the dots provided OR if you would like to be contacted afterwards, please vote using your business card!
THANK YOU