Customer-oriented logistics and warehouse innovations

Strengthening the role of the consumer in an omni-channel world.

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Agenda

- Customer Orientation in Logistics
- Intelligent Order Picking
- Augmented Reality in Warehousing
- Q&A
Customer Orientation

- **[Product] Customisation**: specialisation of a product for one or more customers
- **[Order] Customerisation**: customer amending an order to meet changing needs
Meeting Today’s Logistics Challenges

CHALLENGE 1
- Cost Effective Logistics Offerings

CHALLENGE 2
- Uncertain Operating Environment

CHALLENGE 3
- Changing Needs of Individual Customers

CHALLENGE 4
- Market Shifts & Variations

INTELLIGENT LOGISTICS PROVIDER

- Provider Adaptability
- Provider Efficiency
- Provider Resilience
- Customer Orientation
- Inventory management
- Order management
- Transportation system

The Global Language of Business
Customer Orientation in Intelligent Logistics

- **Closeness**: Keep in contact and effectively communicate.
- **Flexibility**: Respond to changing customer expectations.
- **Accessibility**: Offer enhanced visibility to suppliers and end-customers.

Customer oriented needs

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The Global Language of Business
Customer Orientation in Intelligent Logistics

Customer oriented needs
  /\  closeness
 /   /
Customer oriented needs
  /\  flexibility
 /   /
Customer oriented needs
  /\  accessibility
 /   /
Customer oriented needs

(Intelligent)
Inventory Management

(Intelligent)
Transport systems

(Intelligent)
Order Management

Provider oriented system
Customer Orientation in Intelligent Logistics

Customer oriented needs

- closeness
- flexibility
- accessibility

Inventory Management

Transport systems

Order Management

Provider oriented system

(Intelligent)
Customer Orientation in Intelligent Logistics

- **Customer oriented needs**
- **closeness**
- **flexibility**
- **accessibility**

(Inelligent) **Inventory Management**

(Inelligent) **Transport systems**

(Inelligent) **Order Management**

(Inelligent) **Provider oriented system**
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The role of order picking

Order picking is still the most labour-intensive and time-consuming warehouse operation!

55% - 70% of warehousing costs

Emergence of omni-channel and e-commerce leads to less time availability for order picking and preparation.

Same day delivery, Late cut-off times

Improving order picking can improve the responsiveness of the order fulfilment process
Interventionist order picking

Orders arrive → Batching → Picking

Add new orders on the fly

Orders arrive → Batching → Picking
Implementing the strategy

Main decisions

• How long should I wait at the depot?

• Should I add a new order in my picking list?

• What is the new route I should follow?
Order completion time can be reduced by more than 10% → Orders can get ready for despatch faster

Other important KPIs are not significantly affected.

Information about pickers, orders and products needs to be captured and shared among systems and people

GS1 can play a critical role in this
Other applications of the solution

Substitutions

- Popping corn
  - Ordered but out of stock
  - Pick this instead

Problems with pickers

- Arrival of urgent orders
- Broken trolley
- Sickness/Accident

Substitutions
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Existing applications
State of the art

Our findings after analysing current practice

1. There is a industrial need for understanding the opportunities and barriers for augmented reality in warehouses before implementation

2. Head Mounted Display and smart glasses are very interesting in industry for proposing hands-free solution with the most features

3. Picking is the more studied field and a lot of experiments, in labs and in real environment, have been done.

4. The value added steps represented by the packing and labelling should be more studied with real cases studies.
Research Study

“What are the opportunities and barriers for the adoption of augmented reality in warehouses?”

- **Activity 1: Interviews** with warehouse managers, solution providers and logistics experts in France, Austria, UK, Germany, Netherlands

- **Activity 2: Experiment** with Google Glass using a sorting app we developed from scratch. Goal to gather user feedback from lab testers and warehouse operators
The Sorting app – User View

Put the item in the bin N°1

Click to scan a new item
The Sorting app – User View

Marker

Real world – view through the camera

Virtual Cube

Bin

Instruction to the user
Photos from trial
Benefits and Challenges

Hands-free solution that offers greater flexibility

Creates enthusiasm for human operators

Useful for marketing

Technical characteristics of available technology, e.g. battery, processor

Ergonomics of glasses, e.g. weight, position of camera, eye tiredness

User-friendly and easy to use software needed
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Other Warehouse Innovations

Data-driven inventory checking

(Automatic) Identification and correction of inventory record inaccuracies

B2B vs B2C warehousing

Adaptive storing matching customer demand
Customer-oriented logistics and warehouse innovations

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