PREPARING FOR THE DIGITAL FUTURE OF LOGISTICS

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DHL Americas Innovation Center

St. Louis | 8 October 2019
Agenda for Today

Understanding the driving forces of digitalization

Understanding key technologies and social trends – DHL Logistics Trend Radar

Deep-dive: Robotics & Self-driving Vehicles (Supply Chain Automation)

Open Discussion: Planning for the Digital Future

Interact: Live Demos
Disruption Starts with Unhappy Customers, Not Technology

by Thales S. Teixeira

JUNE 06, 2015
Growing Labor Shortage

75% of the global workforce will comprise of millennials by 2025

Future Logistics Workforce

At the center of digitalization: People

Estimated Amazon Prime users in the US:

Future Logistics Workforce

Digital Consumer & E-Commerce

Digital Logistics Services
E-Commerce: A Driving Force of Logistics Innovation

Source: Alibaba

Singles Day 2018

$30.8 billion USD in sales during 24 hours of sales on Singles Day

$10 billion USD in sales within the first hour of Singles Day

1 billion logistics orders generated during Singles Day
E-Commerce: A Driving Force of Logistics Innovation

Current trend: next day and same day delivery

Optimum facility count for required service levels (covering ~90% of US population)

<table>
<thead>
<tr>
<th>Target service level</th>
<th>2-3 days</th>
<th>Next day</th>
<th>Same day</th>
</tr>
</thead>
<tbody>
<tr>
<td>Radius covered by 1 facility</td>
<td>~650 miles</td>
<td>~150 miles</td>
<td>~90 miles</td>
</tr>
<tr>
<td># of facilities needed</td>
<td>~5</td>
<td>40-50</td>
<td>80-100</td>
</tr>
</tbody>
</table>

Source: DHL Consulting
The New Logistics Landscape

Since 2011 over USD $15 bil. has been invested into over 1,000 logistic-tech startups.
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DHL Innovation Center
Customer-centric innovation platform to drive change through deep understanding future needs and trends
11,000+ supply chain and innovation professionals visiting annually
DHL Logistics Trend Radar 2018/2019

Translating the voice of our customers into key trends that drives our innovation agenda.

Source: DHL Trend Research
Augmented Reality: increasing efficiency and employee engagement through smart glasses that enable hands-free and visually-assisted picking
DHL Logistics Trend Radar 2018/2019

Translating the voice of our customers into key trends that drives our innovation agenda.

Source: DHL Trend Research
IoT: increase health and safety in operations through devices that help avoid incorrect handling of freight
DHL Logistics Trend Radar 2018/2019

Translating the voice of our customers into key trends that drives our innovation agenda.
Virtual Reality: increase employee engagement and operational compliance through immersive trainings
DHL Logistics Trend Radar 2018/2019

Translating the voice of our customers into key trends that drives our innovation agenda.
AI: DHL GLOBAL TRADE BAROMETER

56% of trade is intermediate goods

75% of global trade in 7 countries

10 Industries

2 Transport modes

2 Transport directions

>1.6 million possible predictors

Machine learning model
DHL Global Trade Barometer

Actual Trade

50 = stable
>50 = expansion
<50 = contraction

Prediction for upcoming three months, beginning September 2019

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DHL Logistics Trend Radar 2018/2019

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Robotics & Automation: A “New” Technology in the Logistics Landscape

80% of warehouses globally are still manually operated. The potential for robotics is huge.

Source: St. Onge Company
Robotics & Automation: What’s accelerating the adoption?

**CHALLENGES**

- **Increasing volumes**, e.g. double-digit growth rates in labor-intensive e-Commerce
- **Aging society** and reduced supply of labor

**TECHNICAL ADVANCEMENTS**

- **Decreasing prices** of enabling technologies and modules and improvements in capabilities through advanced intelligence
- **Simplification** and collaboration, shifting the traditional limits of “what can be automated?”

**BENEFITS**

- **Improved accuracy and safety**, doing tasks with fewer mistakes and work in environments unsuitable for humans
- **Efficiency increases and cost reductions**, implementing faster and more economical operations

Source: DHL
Stationary Picking Robots
Stationary picking robots applications

- Co-Packing
- Bar-coding, RFID tagging and labeling
- Kitting, Pre-assemble
- Sequencing/Line feeding
- Picking, packing and dispatch
- Product assembly/postponement/configuration
Stationary picking robots applications – Co-packing
Stationary picking robots applications – Co-packing

AFTER…
Mobile Robots
Utilize the **latest automation technology** for point to point handling and order picking processes which are **labor intensive, repetitive** and consist of **physical strains**

**Expected Benefits:**

- **Accuracy**
  - Avoid errors through manual handling

- **Productivity**
  - Speed up transportation and process times

- **Safety**
  - Reduce manual traffic in the operating environment

- **Reduced Costs**
  - Cost efficient use in 2 to 3 shift operations
How does it work?

DHL and Wärtsilä are implementing mobile robots to support their workforce.
Follow-me carts remove the need for pickers to push carts by following them as they work.
Swarming robots carry an order tote and travel to the location the order needs an item from.
Mobile Robots – Picking Operations (Picking Cart)
Mobile Robots – Autonomous Tuggers
Over 100 robotics initiatives completed to date with many more promising applications to come

AI-enhanced Piece Picking

Trailer Loading/Unloading

Full Pallet Movement Automation
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VISION: NON-STACKABLE PALLET IDENTIFICATION
VISION: NON-STACKABLE PALLET IDENTIFICATION

Speed, consistency, self-learning

200,000 images

9 computer vision & deep learning algorithms

92% detection accuracy

2.5x fewer false positives