

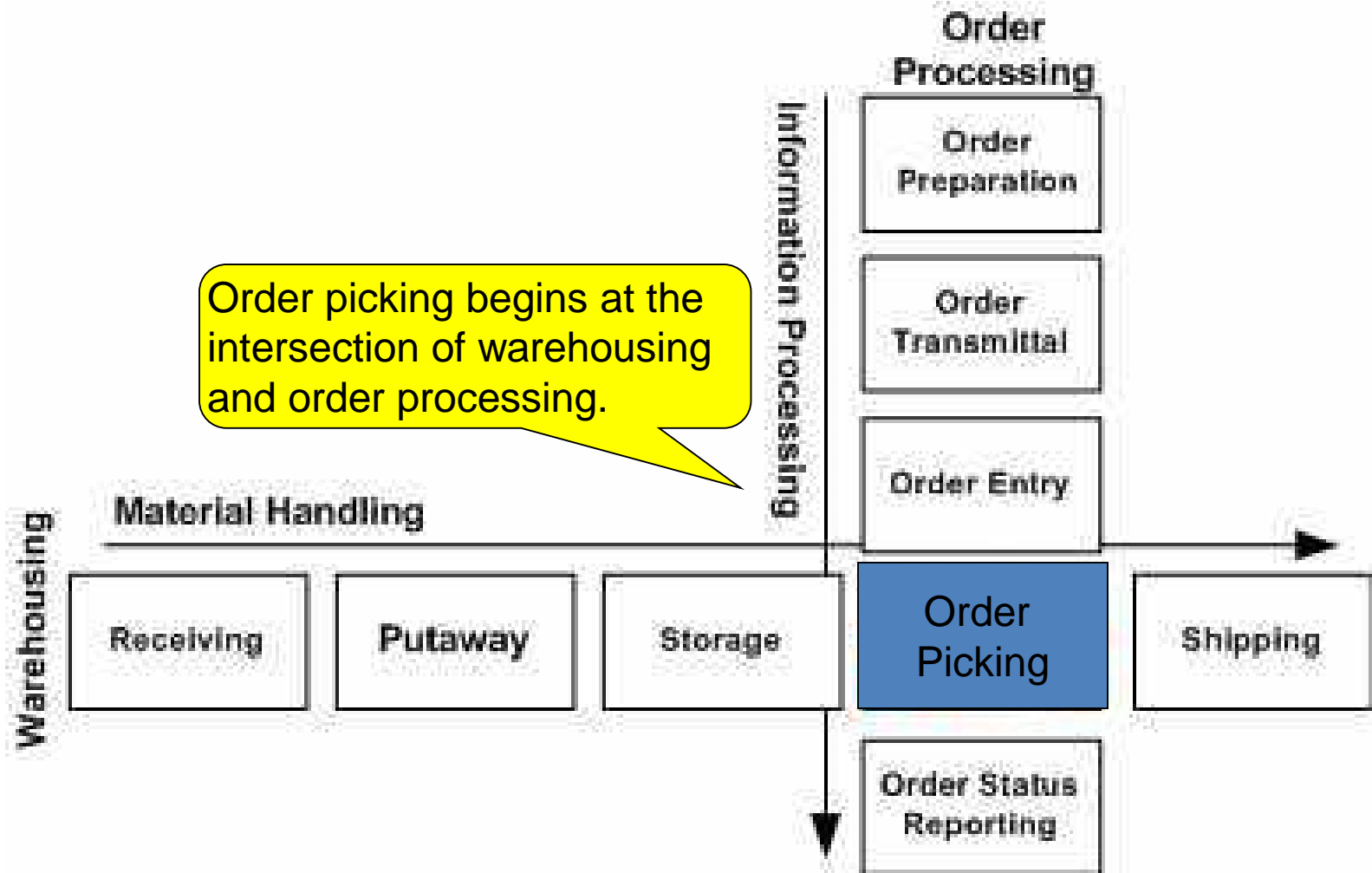
# P10 All For You



SCHOOL OF  
ENGINEERING

## E352 – Retail Logistics

# Recap: Activities in a Warehouse



# Recap: What is Order Picking?

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- Order picking is selection of items from storage in response to specific customer requests
- It includes the physical material handling and information processing associated with retrieving (or picking) items efficiently
- Order picking is the most labor-intensive function in the warehouse
- Most costly activity in a typical warehouse. Costs include labor, material handling equipment (MHE) and information handling systems, errors
- Fast & accurate order picking is essential for retail chains as delay in delivery will cause shortage of stocks in the store

# Traditional Order Picking Flow



- Picker knows the product information from the picking list
- Picker goes to the shelf where the products are located
- Picker pick the products
  - Pallet (Unit Load) Picking
  - Case/Carton Picking
  - Piece (Broken Case) Picking
- Picker check the products against the pick list for accuracy



# Picking using MHE



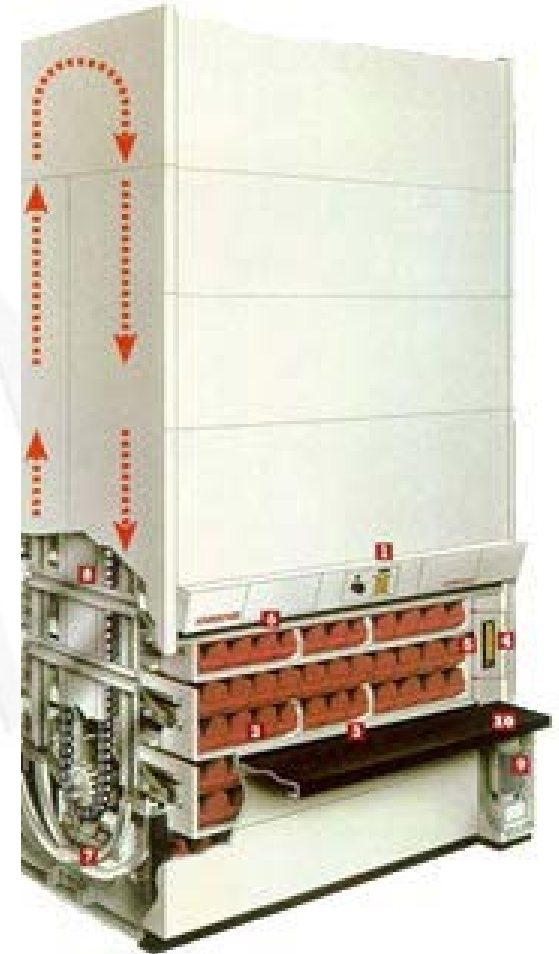
- Pallet trucks and Lift trucks
- Very commonly used in retail industry by smaller warehouse & 3PLs
- Advantages:
  - Low capital investment
  - Safety (all picking takes place at the floor level)
  - Pick large quantities of load (e.g. Pallet level)



# Automated Retrieval Methods



- ASRS
- Lean Lift
- Carousel



# Paperless Picking

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- Customer service is essential for retail/business success
  - One of the most visible part of customer service is order fulfillment process
- Competitive advantage can be achieved if orders can be fulfilled faster, more accurately and at lower cost than others
  - One way to achieve that is to use paperless picking methods
- Paperless picking works by issuing picking instructions electronically, rather than via a printed picking list
- Advantages of paperless picking:
  - Picking error can be greatly reduced
  - Increase in productivity due to real time feedback on order progress & non-reliant on reading of information on paper
  - Improved responsiveness, visibility, traceability and accuracy

# What is Pick-To-Light (PTL) System?

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- It is a Light-directed order fulfillment systems using light indicator modules mounted to shelving, racks or other storage locations
  - Indicator turns on to draw attention to where the quantity is required
- Worker is guided visually by lights to the exact warehouse locations where the ordered articles are to be picked
  - A particular combination of DPDs (Digital Picking Displays) is used, depending on the operating unit designed for each case



# PTL Advantages & Disadvantages



- Advantages:
  - Fast & Accurate
    - Operate in a paperless environment
    - As high as 99% accuracy
  - Enables picking to be done in both hands & in sequence
    - E.g. top to bottom shelf, left to right row



## ► Disadvantages:

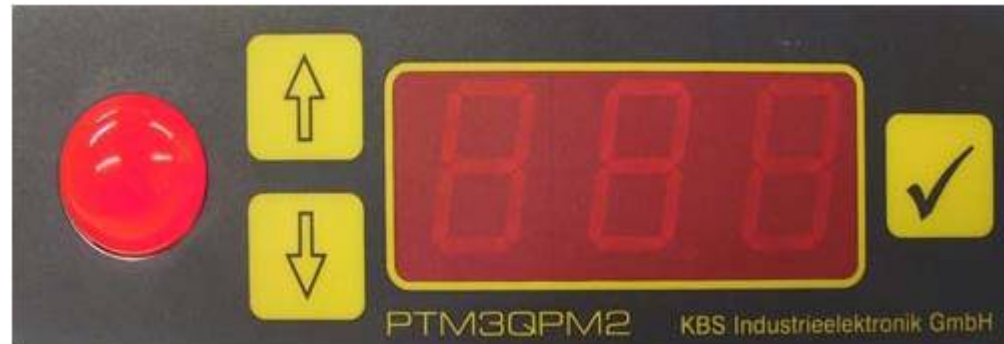
- Requires extensive hardware & software support
  - High initial cost of implementation
- Lack of flexibility
  - Only one pick per location can be done at a time
  - Low support for bin re-profiling



# Pick-To-Light system



# Picking Panel Module (example)



## Functions:

- Shows the parts to be picked
- Shows the number of parts to be picked
- Pick confirmation (channel/zone)

## Example of Picking Process with Pick-To-Light

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1. Orders are downloaded from the host order processing system & barcode is produced for each shipping carton
2. The barcode label is scanned to activate the PTL system & the picking begins
3. Each picking location is identified by a PTL display, which tells the operator which SKU to pick & quantity required
4. The operator confirms the pick by confirmation button. Picking is done with there is no PTL display remain illuminated
5. When all the lights are gone, picking is done for that zone/order.

# When To Use Pick-To-Light?

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- Pick-to-light is basically linked to piece picking or case picking
- Pick-to-light is usually associated with applications for a small number of articles and a large amount of picks per article
  - E.g. FMCG Products
- It is mainly used in product areas with a medium-high turnover, and often combined with Radio Frequency systems (E.g. RF Handhold units) in order to cover areas with a lower turnover

# What is Pick-To-Voice (PTV) System?

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- It is a voice assisted system that prompts the operator through a series of tasks with clear, verbal commands.
- The information is transmitted in real time by a radio frequency (RF) system linked to host computer.
- Operators wear a small headset and lightweight, portable voice terminals attached to a belt around their waist

# PTV Advantages & Disadvantages



- Advantages:
  - Fast & Accurate
    - Operate in a paperless environment
    - As high as 99.9% accuracy
  - Operators does not need to look at the screen or picking list
    - Improves the speed of the picking
  - Operators have their hands free to carry out other tasks

- Disadvantages:
  - Requires extensive hardware & software support
    - High cost of implementation initially
  - Voice recognition varies from user to user
    - Some users takes longer time to be trained than others





# Pick-To-Voice system

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# Example of Picking Process with Pick-To-Voice

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1. In a pick-by-voice system, the picker uses a headset that is possibly connected to a mobile PC. The picking order is transmitted to the picker by RF
2. First, the picker receives oral instructions about the rack where the item is stored.
3. When the picker reaches this rack, he confirms his action by communicating the check digit on this rack.
4. Finally, the picker receives oral instructions about the picking load. After the order is picked, he then confirms this action by using a key word.
5. Simultaneously, a real-time report about the change in inventory is sent to the inventory-management system.

# When To Use Pick-To-Voice?

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- PTV is designed to service split case & full case products
  - E.g. Full case dry grocery distribution
  - Able to increase picking rates by 15% & reduce error as much as to 0.1% or less
- For consolidating batch picked items to be sorted to order
- PTV also can be used for putaway applications other than picking

# PTL Vs PTV

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- PTV is preferred over PTL if there is a very large SKU over a large amount of real estate.
- If pick locations are constantly being re-configured, PTV is also preferred over PTL.
- If high speed picking is required in a zone picking operation, PTL is preferred over PTV.
- If picking environment is very dense, PTL is preferred over PTV.

# Today's Problem - Suggested Solution

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- Paperless picking works by issuing picking instructions electronically, rather than via a printed picking list
- The 2 main paperless picking technologies are PTL & PTV
  - Both applicable to TT Supermarket, and can improve the picking rate and update real-time
  - Investment cost of both systems are relatively high
  - Picking process can be assisted by the use of MHE such as pallet trucks

# Suggested Solution

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- Consideration for PTL
  - Due to the huge size of the DC, it will require extensive cabling of all the locations to mount the PTL light displays
  - Require picking logic by making use of the LED displays and lights to not just direct picker to the location and quantity to pick, but also to provide more information such as start and end of pick task, and which task is assigned to which picker
- Consideration for PTV
  - Due to the huge size of the DC, there must be sufficient WiFi coverage to avoid any blind spots that will affect transmission of information
  - Require training for staff in order to use the system
  - With both hands free and without the need to look at the paper or screen to determine the next pick item, pickers are able to be directed entirely by the system

# Suggested Solution

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- PTL is preferred
  - Dense picking area
  - Higher speed picking
  - Currently using zone picking

# Learning Outcomes

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- List and explain the picking systems & equipment
- Explain paperless picking
- Analysis and explain Pick-to-light system
- Analysis and explain Pick-to-voice system