

Takeout wall grocery

Implementation example

www.pickdelso.com

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Introduction

- Takeout wall grocery includes a dark store for grocery products and Takeout wall (A dark store is intended only for employees, i.e. pickers, who do picking of products.)
- Those urban areas, which comprise many local groceries, one of the local groceries can be replaced with Takeout wall grocery
- A customer chooses in a click & collect service a time window for collecting shopping at Takeout wall grocery
- In this implementation example Takeout wall serves customers 24 h

Time periods and windows

- Day (24 h) is divided into three periods and eight time windows
- Time periods and their lengths:
 - From morning to afternoon, 07 – 15, eight hours
 - Rush hours, 15 – 19, four hours
 - From evening to morning, 19 – 15, twelve hours
- Time window table:

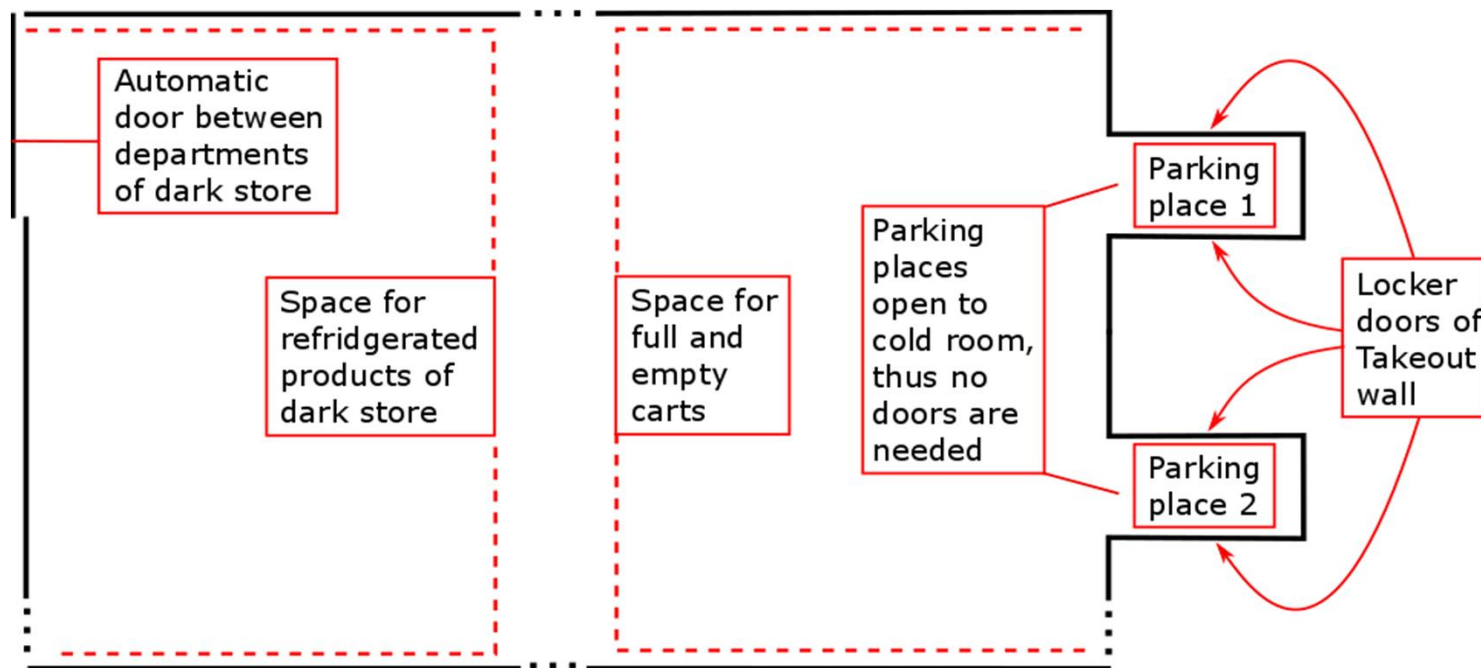
From morning to afternoon	Rush hours	From evening to morning
07 – 11	15 – 16	19 – 23
11 – 15	16 – 17	23 – 07
	17 – 18	
	18 – 19	

Picking cycle

- Within each picking cycle a picker moves a cart on aisles of the dark store and places products into the cart
- Dry goods and frozen food locate at a room-temperature department of the dark store
- Frozen food is picked from freezers
- A cold room is intended for re Fridgerated products and it functions as one department of the dark store
- A picking cycle starts from the cold room and (usually) continues at the room-temperature department
- The picking cycle ends into the cold room

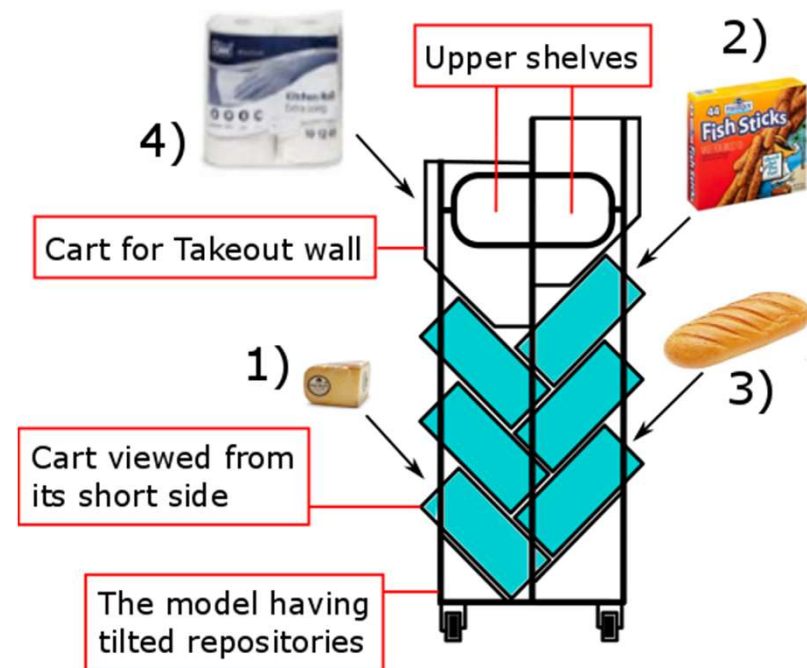
Cold room

- Figure shows the cold room and Takeout wall from a bird's perspective (Takeout wall comprises parking places for two carts.)



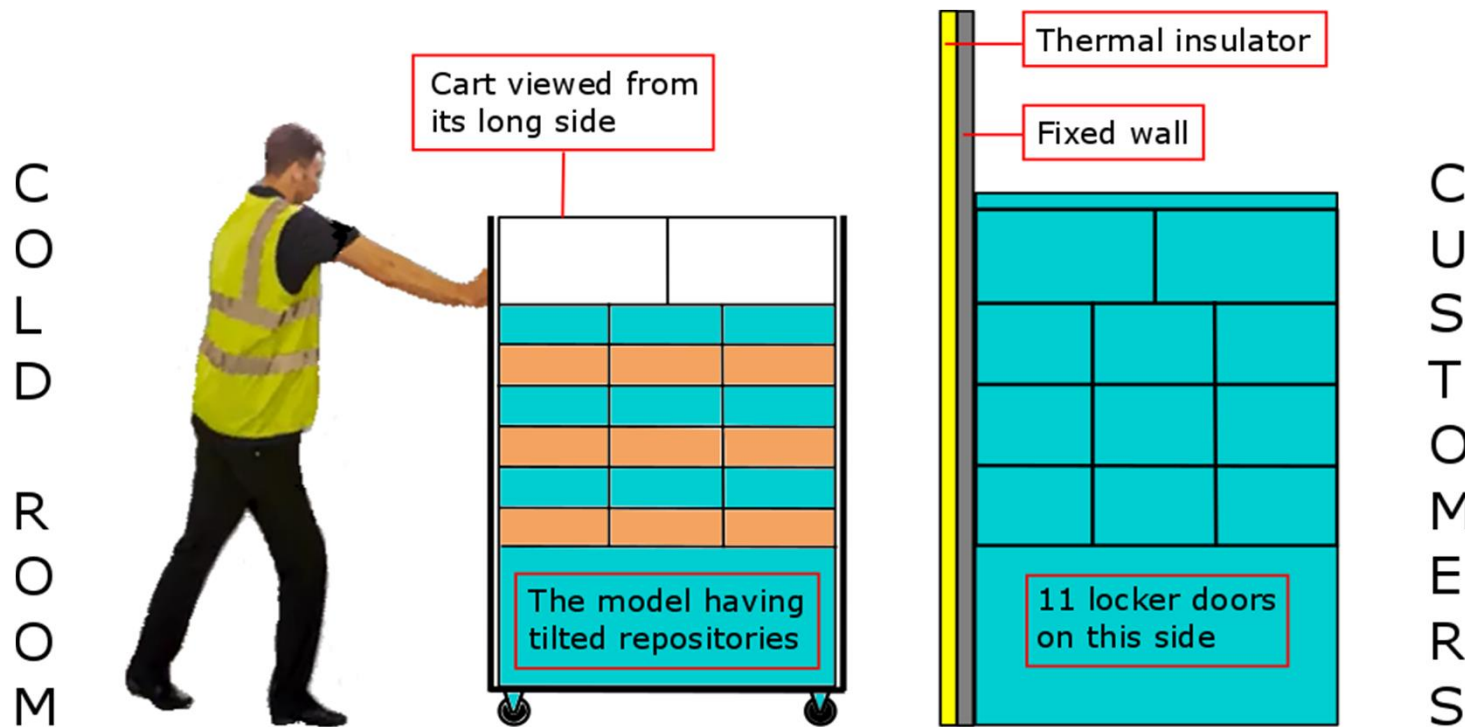
Use of cart

- Figure shows the cart from its short side
- First, 1) refrigerated products are picked into repositories
(Picking is done in the cold room.)
- Next: 2) frozen food and
3) other small-sized goods
are picked into repositories
(Picking is done in the room-temperature department.)
- Finally, 4) large-sized dry
goods are picked onto
upper shelves of the cart
(The large-sized dry goods may block the picker's field
of view, thus they are picked last.)



Parking at Takeout wall

- Figure shows pushing a cart into a parking place (at Takeout wall)
- After parking two carts the customers can collect their shopping by opening locker doors

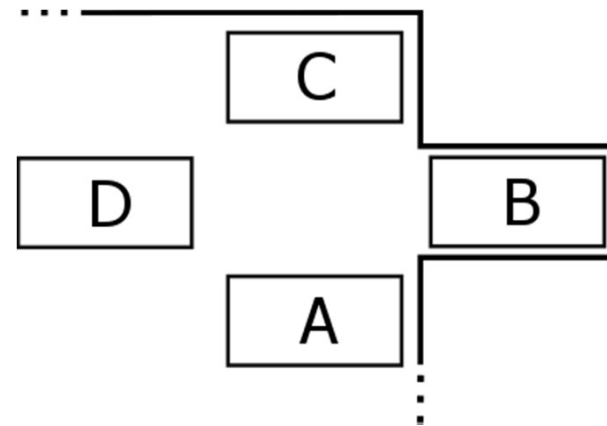


Additional carts

- It is reasonable to have more than two carts per parking place
- Those additional carts are useful, for example, in **buffering**, which means that products are picked a good time (a number of hours) before the delivery
- Buffering increases possibilities to time-schedule picking work
- Additional carts are also useful in case of **overflow**
- Overflow means lack of capacity in Takeout wall (i.e. Takeout wall is lacking free repositories)
- The third use case for the additional carts concerns a **delay of customer**
- The use cases are described in detail in the following

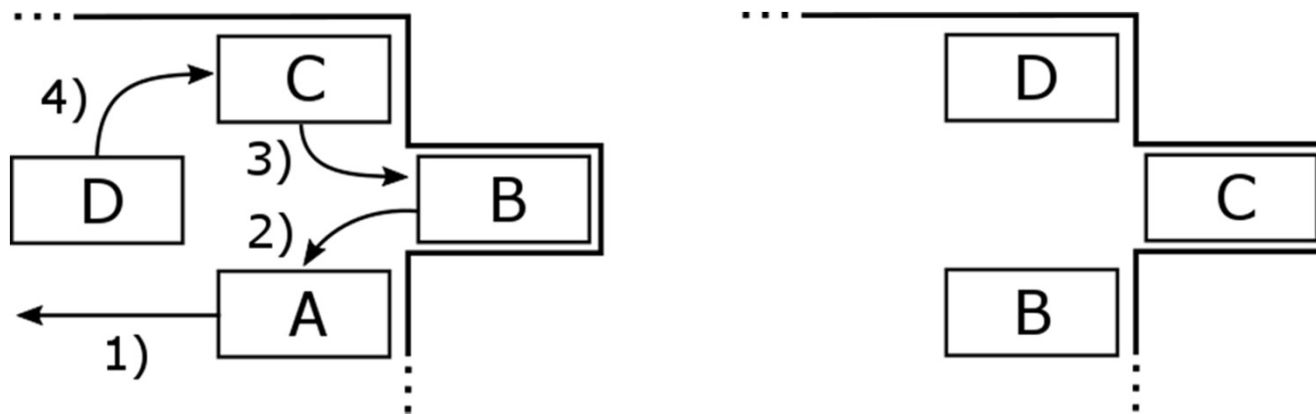
Buffering

- Figure shows four carts A – D from a bird's perspective
- There are two additional carts per a parking place
- Carts have been used in picking in the order: A, B, C, and D
- Cart D is just arrived from a picking cycle
- Cart A is empty and cart B is empty, if the all customers have collected their shopping
- Cart C operates as a buffer, i.e. it replaces cart B in Takeout wall before cart D



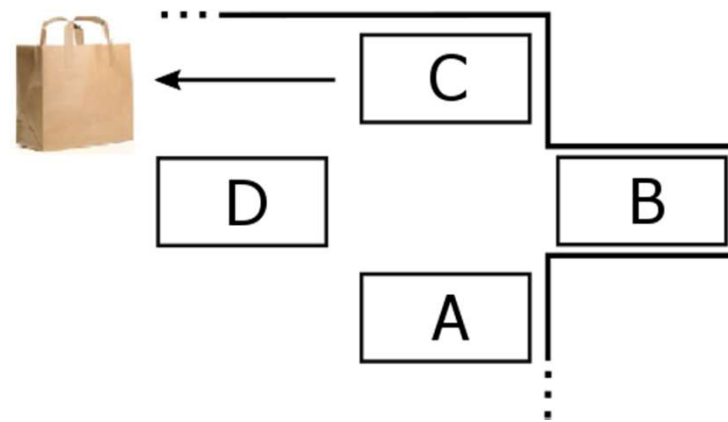
Changing of carts

- Figure on the left shows places of carts A – D and place changes 1) – 4) when a time window is closed
- The place changes relate to the buffering
- Figure on the right shows new places of carts B – D after the place changes (Cart A is currently in use in a picking cycle.)



Over flow

- Especially at rush hours Takeout wall may have a lack of capacity and a customer is informed about the overflow (in the click & collect service used by the customer)
- Normally, the all carts (A – D) are included in different time windows but in case over flow cart B and C are included in the same time window
- The customer pushes at the delivery point a call button to call a picker
- The picker fetches the customer's shopping from cart C



Deley of customer

- A customer hasn't collected shopping within the time window just ended
- The customer will obtain the shopping by using the call button, if the customer reaches the delivery point within the next time window
- Shopping are kept in cart A until the next time window ends
- After that the shopping are returned in cart A to the dark store

