

CLAIMS

What is claimed is:

1. A computer-implemented system for delivery scheduling from a fulfillment center, the system comprising:
 - a memory storing instructions; and
 - at least one processor configured to execute the instructions to perform operations comprising:
 - maintaining a first data structure representing a fulfillment center, the data structure comprising elements representing portions of the fulfillment center, each of the portions being associated with:
 - a plurality of physical locations in the respective portion, and
 - a cutoff time for delivery, before a first time period, of products in the physical locations;
 - maintaining a second data structure comprising a mapping between physical locations and product identifiers;
 - receiving a request to provide a delivery time estimate associated with a requested product;
 - searching the second data structure to identify at least one physical location associated with the requested product;
 - searching the first data structure to determine cutoff times, associated with each of the at least one physical location; and
 - returning, responsive to the request, a first cutoff time selected from the cutoff times, the first cutoff time being associated with a faster delivery estimate

than other cutoff times in each of the at least one physical location.

2. The system of claim 1, wherein:

searching the second data structure comprises filtering the physical locations in the second data structure; and

the operations further comprise:

requesting available inventory from fulfillment centers associated with the filtered physical locations; and

selecting a fulfillment center from the fulfillment centers based on distance between a location associated with a customer device and the fulfillment centers.

3. The system of claim 1, wherein the operations further comprise:

receiving, responsive to searching the second data structure, a plurality of physical locations;

searching the first data structure for each of the plurality of physical locations to determine a plurality of cutoff times; and

selecting one of the physical locations based on a comparison between a current time and respective cutoff times.

4. The system of claim 1, wherein:
 - the request is received from a system for displaying web pages to a customer device; and
 - the operations further comprise:
 - determining, based on information associated with the customer device, a fulfillment center and associated physical location for the product; and
 - sending the first cutoff time to the system for displaying web pages.
5. The system of claim 1, wherein the operations further comprise:
 - receiving, from a first device, a first scan event comprising an identifier associated with a first physical location stored in the first data structure;
 - receiving, from a second device, a second scan event comprising a product identifier associated with the requested product;
 - determining a time period based on the first scan event and the second scan event; and
 - modifying, based on the determined time period, the cutoff time associated with the portion containing the first physical location in the first data structure.
6. The system of claim 5, wherein modifying the cutoff time comprises:
 - analyzing a plurality of first scan events and a plurality of second scan events;
 - calculating a distance between packaging centers and the plurality of physical locations based on the plurality of first scan events and the plurality of second scan events.

7. The system of claim 6, wherein each cutoff time is inversely proportional to respective ones of the calculated distance for each of the associated physical locations.
8. The system of claim 1, wherein the plurality of physical locations are associated with shelf locations or pallet locations inside of an associated fulfillment center.
9. The system of claim 8, wherein
 - the plurality of physical locations have an optical or wireless tag attached, and
 - the optical or wireless tag is associated with a physical location identifier stored in the first data structure.
10. The system of claim 1, wherein:
 - the first data structure is stored in a first database;
 - the second data structure is stored in a second database different from the first database; and
 - the second database is stored in a server within the fulfillment center.

11. A computer-implemented method for delivery scheduling from a fulfillment center, the method comprising:
- maintaining a first data structure representing a fulfillment center, the data structure comprising elements representing portions of the fulfillment center, each of the portions being associated with:
 - a plurality of physical locations in the respective portion, and
 - a cutoff time for delivery, before a first time period, of products in the physical locations;
 - maintaining a second data structure comprising a mapping between physical locations and product identifiers;
 - receiving a request to provide a delivery time estimate associated with a requested product;
 - searching the second data structure to identify at least one physical location associated with the requested product;
 - searching the first data structure to determine cutoff times associated with each of the at least one physical location; and
 - returning, responsive to the request, a first cutoff time selected from the cutoff times, the first cutoff time being associated with a faster delivery estimate than other cutoff times in each of the at least one physical location.

12. The method of claim 11, wherein:

searching the second data structure comprises filtering the physical locations in the second data structure based on the customer device; and

the method further comprises:

requesting available inventory from fulfillment centers associated with the filtered physical locations; and

selecting a fulfillment center from the fulfillment centers based on distance between a location associated with a customer device and the fulfillment centers.

13. The method of claim 11 further comprising:

receiving, responsive to searching the second data structure, a plurality of physical locations;

searching the first data structure for each of the plurality of physical locations to determine a plurality of cutoff times; and

selecting one of the physical locations based on a comparison between a current time and respective cutoff times.

14. The method of claim 11, wherein:

the request is received from a system for displaying web pages to a customer device; and

the method further comprises:

determining, based on information associated with the customer device, a fulfillment center and associated physical location for the product; and
sending the first cutoff time to the system for displaying web pages.

15. The method of claim 11 further comprising:

receiving, from a first device, a first scan event comprising an identifier associated with a first physical location stored in the first data structure;

receiving, from a second device, a second scan event comprising a product identifier associated with the requested product;

determining a time period based on the first scan event and the second scan event; and

modifying, based on the determined time period, the cutoff time associated with the portion containing the first physical location in the first data structure.

16. The method of claim 15, wherein modifying the cutoff time comprises:

analyzing a plurality of first scan events and a plurality of second scan events; and

calculating a distance between packaging centers and the plurality of physical locations based on the plurality of first scan events and the plurality of second scan events.

17. The method of claim 16, wherein each cutoff time is inversely proportional to respective ones of the calculated distance for each of the associated physical locations.
18. The method of claim 11, wherein the plurality of physical locations are associated with shelf locations or pallet locations inside of an associated fulfillment center.
19. The method of claim 18, wherein
 - the plurality of physical locations have an optical or wireless tag attached, and
 - the optical or wireless tag is associated with a physical location identifier stored in the first data structure.
20. A non-transitory computer-readable medium storing instructions that, when executed by a processor, perform operations for delivery scheduling from a fulfillment center, the operations comprising:
 - maintaining a first data structure representing a fulfillment center, the data structure comprising elements representing portions of the fulfillment center, each of the portions being associated with:
 - a plurality of physical locations in the respective portion,
 - and
 - a cutoff time for delivery, before a first time period, of products in the physical locations;
 - maintaining a second data structure comprising a mapping between physical locations and product identifiers;
 - receiving a request to provide a delivery time estimate associated with a requested product;

filtering the physical locations in the second data structure based on the customer device to identify at least one physical location associated with the requested product;

requesting available inventory from fulfillment centers associated with the filtered physical locations;

selecting a fulfillment center from the fulfillment centers based on distance between a location associated with a customer device and the fulfillment centers;

searching the first data structure for each of the plurality of physical locations to determine a plurality of cutoff times;

selecting one of the physical locations based on a comparison between a current time and respective cutoff times; and

returning, responsive to the request, a first cutoff time selected from the plurality of cutoff times, the first cutoff time being associated with a faster delivery estimate than other cutoff times in each of the at least one physical location.