

CLAIMS

What is claimed is:

1. A computer-implemented system for outbound forecasting, the system comprising:
 - a memory storing instructions; and
 - at least one processor configured to execute the instructions to:
 - receive an initial distribution of postal codes mapped to each region;
 - run a simulation, using a simulation model, of the initial distribution, wherein running the simulation comprises simulating an allocation of customer orders based on the initial distribution of postal codes;
 - calculate an outbound capacity utilization value of each fulfillment center (FC) in each region;
 - determine a number of FCs comprising an outbound capacity utilization value that exceeds a predetermined threshold;
 - feed an optimization heuristic with at least one of the postal codes mapped to a region from the initial distribution to generate one or more additional distributions of postal codes, until the number of FCs comprising the outbound capacity utilization value that exceeds the predetermined threshold exceeds a second predetermined threshold;
 - generate, using the optimization heuristic, an optimal distribution of postal codes mapped to each region based on the one or more additional distributions of postal codes; and

modify an allocation of customer orders among a plurality of FCs based on the generated optimal distribution of postal codes.

2. The system of claim 1, wherein the predetermined threshold comprises a minimum outbound of each FC.
3. The system of claim 1, wherein the outbound capacity utilization value of each FC comprises a ratio of an outbound of each FC to an outbound capacity of each FC.
4. The system of claim 1, wherein the optimization heuristic comprises a genetic algorithm.
5. The system of claim 1, wherein the initial distribution of postal codes mapped to each region is randomly generated.
6. The system of claim 1, wherein the at least one processor is further configured to execute the instructions to cache at least a portion of the optimization heuristic.
7. The system of claim 6, wherein the cached portion of the optimization heuristic comprises at least one constraint that remains substantially constant with each run of the simulation model.

8. The system of claim 1, wherein the at least one processor is further configured to execute the instructions to:
determine one or more constraints associated with at least one of the postal codes; and
apply the one or more constraints to the optimization heuristic to generate the one or more additional distributions of postal codes.
9. The system of claim 8, wherein applying the one or more constraints to the optimization heuristic comprises eliminating at least one of the one or more additional distributions of postal codes that ignore the one or more constraints.
10. The system of claim 1, wherein the optimization heuristic comprises at least one constraint, the constraint comprising at least one of customer demand at each of the FCs, maximum capacities of the FCs, compatibility with FCs, or transfer costs between FCs.
11. A computer-implemented method for outbound forecasting, the method comprising:
receiving an initial distribution of postal codes mapped to each region;
running a simulation, using a simulation model, of the initial distribution
wherein running the simulation comprises simulating an allocation of customer orders based on the initial distribution of postal codes;

calculating an outbound capacity utilization value of each fulfillment center (FC) in each region;

determining a number of FCs comprising an outbound capacity utilization value that exceeds a predetermined threshold;

feeding an optimization heuristic with at least one of the postal codes mapped to a region from the initial distribution to generate one or more additional distributions of postal codes, until the number of FCs comprising the outbound capacity utilization value that exceeds the predetermined threshold exceeds a second predetermined threshold;

generating, using the optimization heuristic, an optimal distribution of postal codes mapped to each region based on the one or more additional distributions of postal codes; and

modifying an allocation of customer orders among a plurality of FCs based on the generated optimal distribution of postal codes.

12. The method of claim 11, wherein the predetermined threshold comprises a minimum outbound of each FC.
13. The method of claim 11, wherein the outbound capacity utilization value of each FC comprises a ratio of an outbound of each FC to an outbound capacity of each FC.
14. The method of claim 11, wherein the optimization heuristic comprises a genetic algorithm.

15. The method of claim 11, wherein the initial distribution of postal codes mapped to each region is randomly generated.
16. The method of claim 11, further comprising caching at least a portion of the optimization heuristic.
17. The method of claim 16, wherein the cached portion of the optimization heuristic comprises at least one constraint that remains substantially constant with each run of the simulation model.
18. The method of claim 11, further comprising:
determining one or more constraints associated with at least one of the postal codes; and
applying the one or more constraints to the optimization heuristic to generate the one or more additional distributions of postal codes.
19. The method of claim 18, wherein applying the one or more constraints to the optimization heuristic comprises eliminating at least one of the one or more additional distributions of postal codes that ignore the one or more constraints.
20. A computer-implemented system for outbound forecasting, the system comprising:
a memory storing instructions; and

at least one processor configured to execute the instructions to:

receive an initial distribution of postal codes mapped to each region,
wherein the initial distribution of postal codes is randomly
generated, and wherein running the simulation comprises
simulating an allocation of customer orders based on the initial
distribution of postal codes;

run a simulation, using a simulation model, of the initial distribution;

calculate an outbound capacity utilization value of each fulfillment
center (FC);

determine a number of FCs comprising an outbound capacity utilization
value that exceeds a predetermined threshold;

determine one or more constraints associated with at least one of the
postal codes;

feed a genetic algorithm with at least one of the postal codes mapped
to a region from the initial distribution to generate one or more
additional distributions of postal codes, until the number of FCs
comprising the outbound capacity utilization value that exceeds
the predetermined threshold exceeds a second predetermined
threshold, wherein:

one or more constraints are applied to the genetic
algorithm to generate the one or more additional
distributions of postal codes;

generate, using the genetic algorithm, an optimal distribution of postal
codes mapped to each region based on the one or more
additional distributions of postal codes; and

modify an allocation of customer orders among a plurality of FCs based
on the generated optimal distribution of postal codes.