

Claims

What is claimed is:

1. A computer-implemented system for attendance assignment, the system comprising:
 - a memory storing instructions; and
 - at least one processor configured to execute the instructions to:
 - retrieve, from a database, a plurality of delivery routes and a plurality of delivery sub-routes, wherein the delivery sub-routes are part of the delivery routes;
 - calculate, based on the retrieval, a number of packages allocated to the delivery sub-routes;
 - receive, as input, a number and a type of workers available for deliveries, wherein the type including at least one of classification characteristics or efficiency characteristics;
 - assign, based on the calculated number of packages and the received input, the workers to a plurality of groups, wherein the groups correspond to different delivery routes or sub-routes;
 - compare, based on the assignment, the assigned workers against the delivery routes or the delivery sub-routes;
 - modify, based on the comparison, a quantity of at least one of the delivery routes or the delivery sub-routes to match an amount of the assigned workers;
 - generate, based on the classification characteristics and the efficiency characteristics, a plurality of candidate routes associated with the workers;
 - calibrate, based on the modified quantities and the generated candidate routes, modified delivery sub-routes; and
 - determine an expected delivery efficiency, the expected delivery efficiency being measured by percentiles of addresses visited by the workers per hour (APH);
 - calculate, based on historical data, the APH for selected individual pre-defined regions and sub-regions;
 - weigh, based on the APH, the workers according to the classification characteristics and the efficiency characteristics;
 - transmit, based on the weights assigned to the workers, forward at least one of the modified delivery sub-routes to an electronic mobile device associated with a delivery worker, the mobile device configured to capture data associated with an identifier of a package upon delivery;
 - receive information from the mobile device relating to the delivery, wherein the information is configured to be stored as historical data;
 - recalculate, based on the stored historical data, the APH for the selected individual pre-defined regions and sub-regions; and

recalibrate, based on the recalculated APH, the at least one of the modified delivery sub-routes.

2. The computer-implemented system for attendance assignment of claim 1, wherein the at least one processor is further configured to:

generate the delivery routes and the delivery sub-routes based on the stored historical data and map data optimization.

3. The computer-implemented system for attendance assignment of claim 1, wherein the at least one processor is further configured to:

receive geographical data from a plurality of pre-defined regions and a plurality of sub-regions, wherein the geographical data includes at least one of landscape data, business data, residential data, parking data, or building data; and
~~determine, based on the geographical data, an expected delivery efficiency, the expected delivery efficiency being measured by percentiles of addresses visited by the workers per hour (APH); and~~

calculate, based on ~~historical~~ the geographical data, the APH for selected individual pre-defined regions and sub-regions.

4. The computer-implemented system for attendance assignment of claim 1, wherein the at least one processor is further configured to:

calculate an expected time for travel between first and second regions, wherein the expected time includes a cross-region time and a sub-region time based on a median time gap or an average time; and
determine, based on a linear regression and the cross-region time, a travel time between the first and the second regions.

5. The computer-implemented system for attendance assignment of claim 1, wherein the ~~user~~ input further includes a package distribution and an attendance value.

6. The computer-implemented system for attendance assignment of claim 1, wherein the at least one processor is further configured to:

generate at least one of delivery regions or delivery sub-regions associated with the delivery routes or the delivery sub-routes; and

combine the generated delivery regions and the generated delivery sub-regions into new regions for delivery.

7. The computer-implemented system for attendance assignment of claim 6, wherein the at least one processor is further configured to:

generate candidate delivery regions and candidate delivery sub-regions associated with the candidate routes;

combine the generated candidate delivery regions and the generated candidate delivery sub-regions into new regions for delivery; and

determine a combination of the generated candidate delivery regions and the generated candidate delivery sub-regions based on ~~a~~the calculated expected delivery efficiency value (APH) and a calculated cross-region time.

8. The computer-implemented system for attendance assignment of claim 7, wherein the at least one processor is further configured to:

redistribute at least one of candidate delivery regions and candidate delivery sub-regions based on the calculated expected delivery efficiency value and the calculated cross-region time.

9. The computer-implemented system for attendance assignment of claim 1, wherein the at least one processor is further configured to:

increase or decrease the quantity of the delivery routes and increase or decrease the quantity of the delivery sub-routes to match the amount of the assigned workers.

10. The computer-implemented system for attendance assignment of claim 1, wherein the at least one processor is further configured to:

classify the workers into at least one of a plurality of categories according to the classification characteristics; ~~and~~

~~weigh, based on the classification characteristics, the workers according to the efficiency characteristics.~~

11. The computer-implemented system for attendance assignment of claim 1, wherein the at least one processor is further configured to:

receive, based on the ~~user~~ input, the number and the type of the workers available for deliveries, at a graphical user interface (GUI) from at least one of a web browser or a mobile device.

12. The computer-implemented system for attendance assignment of claim 1, wherein the at least one processor is further configured to:

calculate an average deviation value of the groups based on an average number of packages per worker delivery.

13. The computer-implemented system for attendance assignment of claim 1, wherein the classification characteristics include at least one of experience or efficiency.

14. A computer-implemented method for attendance assignment, the method comprising:

retrieving, from a database, a plurality of delivery routes and a plurality of delivery sub-routes, wherein the delivery sub-routes are part of the delivery routes;
calculating, based on the retrieval, a number of packages allocated to the delivery sub-routes;

receiving, as input, a number and a type of workers available for deliveries, wherein the type including at least one of classification characteristics or efficiency characteristics;

assigning, based on the calculated number of packages and the received input, the
 workers to a plurality of groups, wherein the groups correspond to different
 delivery routes or sub-routes;
 comparing, based on the assignment, the assigned workers against the delivery routes or
 the delivery sub-routes;
 modifying, based on the comparison, a quantity of at least one of the delivery routes or
 the delivery sub-routes to match an amount of the assigned workers;
 generating, based on the classification characteristics and the efficiency characteristics, a
 plurality of candidate routes associated with the workers;
 calibrating, based on the modified quantities and generated candidate routes, modified
 delivery sub-routes; ~~and~~
determining an expected delivery efficiency, the expected delivery efficiency being
measured by percentiles of addresses visited by the workers per hour (APH);
calculating, based on historical data, the APH for selected individual pre-defined regions
and sub-regions;
weighing, based on the APH, the workers according to the classification characteristics
and the efficiency characteristics; and
transmitting, based on the weights assigned to the workers, forwarding at least one of the
modified delivery sub-routes to an electronic mobile device associated with a
delivery worker, the mobile device configured to capture data associated with an
identifier of a package upon delivery;
receiving information from the mobile device relating to the delivery, wherein the
information is configured to be stored as historical data;
recalculating, based on the historical data, the APH for the selected individual pre-
defined regions and sub-regions; and
recalibrating, based on the recalculated APH, the at least one of the modified delivery
sub-routes.

15. The computer-implemented method of claim 14, the method further comprising:
 generating the delivery routes and the delivery sub-routes based on the stored historical
 data and map data optimization.
16. The computer-implemented method of claim 14, the method further comprising:
 receiving geographical data from a plurality of pre-defined regions and a plurality of sub-
 regions, wherein the geographical data includes at least one of landscape data,
 business data, residential data, parking data, and building data; and
~~determining, based on the geographical data, an expected delivery efficiency, the~~
~~expected delivery efficiency being measured by percentiles of addresses visited~~
~~by the workers per hour (APH); and~~

calculating, based on ~~historical~~ the geographical data, the APH for selected individual pre-defined regions and sub-regions.

17. The computer-implemented method of claim 14, the method further comprising:

calculating an expected time to travel between first and second regions, wherein the expected time includes a cross-region time and a sub-region time based on a median time gap or an average time; and

determining, based on a linear regression and the cross-region time, a travel time between the first and the second regions.

18. The computer-implemented method of claim 14, wherein the ~~user~~ input further includes a package distribution and an attendance value.

19. The computer-implemented method of claim 14, the method further comprising:

generating at least one of delivery regions or delivery sub-regions associated with the delivery routes or the delivery sub-routes; and

combining the generated delivery regions and the generated delivery sub-regions into new regions for delivery.

20. ~~A system comprising:~~

~~a database comprising geographical data and historical delivery data, the geographical data being stored in pre-defined regions and sub-regions;~~

~~an expected delivery efficiency generator implemented in software or hardware, configured to:~~

~~receive geographical data from a plurality of the pre-defined regions and a plurality of the sub-regions, wherein the geographical data includes at least one of landscape data, business data, residential data, parking data, or building data;~~

~~determine, based on the geographical data, an expected delivery efficiency, the expected delivery efficiency being measured by percentiles of addresses visited by the workers per hour (APH); and~~

~~calculate, based on the historical delivery data, the APH for selected individual pre-defined regions and sub-regions;~~

~~a cross time generator implemented in software or hardware, configured to:~~

~~calculate an expected time for the workers to travel between first and second regions, wherein the expected time includes a cross-region time and a sub-region time based on a median time gap or an average time; and~~

~~determine, based on a linear regression and the cross-region time, a driving time between the first and the second regions; and~~

~~a route generator implemented in software or hardware, configured to:~~

~~allocate a number of workers to the groups based on user input including a package distribution and an attendance value.~~

~~generate delivery regions and delivery sub-regions associated with the delivery routes and the delivery sub-routes;~~
~~combine the generated delivery regions and the generated delivery sub-regions into new delivery regions; and~~
~~forwarding at least one sub-route to an electronic device associated with a delivery worker.~~

20. A non-transitory computer-readable medium storing instructions that, when executed by a processor, cause the processor to perform operations comprising:

retrieving, from a database, a plurality of delivery routes and a plurality of delivery sub-routes, wherein the delivery sub-routes are part of the delivery routes;

calculating, based on the retrieval, a number of packages allocated to the delivery sub-routes;

receiving, as input, a number and a type of workers available for deliveries, wherein the type including at least one of classification characteristics or efficiency characteristics;

assigning, based on the calculated number of packages and the received input, the workers to a plurality of groups, wherein the groups correspond to different delivery routes or sub-routes;

comparing, based on the assignment, the assigned workers against the delivery routes or the delivery sub-routes;

modifying, based on the comparison, a quantity of at least one of the delivery routes or the delivery sub-routes to match an amount of the assigned workers;

generating, based on the classification characteristics and the efficiency characteristics, a plurality of candidate routes associated with the workers;

calibrating, based on the modified quantities and generated candidate routes, modified delivery sub-routes;

determining an expected delivery efficiency, the expected delivery efficiency being measured by percentiles of addresses visited by the workers per hour (APH);

calculating, based on historical data, the APH for selected individual pre-defined regions and sub-regions;

weighing, based on the APH, the workers according to the classification characteristics and the efficiency characteristics;

transmitting, based on the weights assigned to the workers, at least one of the modified delivery sub-routes to a mobile device associated with a delivery worker, the mobile device configured to capture data associated with an identifier of a package upon delivery;

receiving information from the mobile device relating to the delivery, wherein the information is configured to be stored as historical data;

recalculating, based on the historical data, the APH for the selected individual pre-defined regions and sub-regions; and

recalibrating, based on the recalculated APH, the at least one of the modified delivery sub-routes.