Claims

1. A method of managing transport service providers, the method comprising:-

a provider data receiving step of receiving, in real time, a first data flow, the first data flow comprising data indicative of each of plural service providers, the data comprising an indication of the identity of each service provider, availability data of the respective service provider and an indication of location of each the respective service provider;

a forecasting step of processing the first data flow and stored historical supply/demand data to provide a forecast of the number of service providers and number of services requests over an area comprising plural geographical zones, wherein the forecast is by zone;

a filter and selection step of filtering the first data flow using availability criteria to output data indicative of candidate service providers, wherein the data indicative of each candidate service provider includes an indication of the identity of each candidate service provider associated with a location of the respective candidate service provider;

an optimization step of combining the data indicative of candidate service providers with the forecast number of service providers and number of service requests and calculating there with a distance/time matrix of candidate service providers moving to each different zone from their current zone, thereby to establish a set of candidate service providers eligible to be moved from their current zone to a respective new zone; and

a notification step of outputting a respective notification to only each eligible service provider, the notification comprising an indication of a new location in a new zone, whereby the number of service providers in at least some zones converges on the number of service requests.

2. The method of claim 1, further comprising receiving in real-time a request data flow comprising at least some of data indicative of a requester, time of request, pickup location and drop off location.

3. The method of claim 1 further comprising:-

receiving in real time a request data flow having at least some of data indicative of requester, time of request, pickup location and drop off location and;

storing data from said request data flow and the first data flow.

4. The method of claim 1, further comprising processing received service request data, the service provider status and location information and storing the result as historical demand and supply data.

5. The method of claim 1, wherein the forecasting step comprises applying a forecasting process to historical supply and demand imbalance data to predict what the imbalance would look like in one or more forthcoming time intervals for each zone covered by the system.

6. The method of claim 5, wherein the forecasting process employs one of Time Series forecasting techniques, such as Double Seasonal Holt-Winters (DSHW), AutoRegressive Integrated Moving Average (ARIMA) for demand and supply forecasting.

7. The method of claim 5, wherein the forecasting step comprises using machine learning techniques, such as Recurrent Neural Networks (RNN), Long Short Term Memory (LSTM) etc for demand and supply forecasting.

8. The method of claim 7 wherein the forecasting step additionally comprises using data from a third party data store storing externally supplied data.

9. The method of claim 1, wherein the optimization step comprises receiving forecasted demand and supply data, data indicative of the identity of candidate service providers and: historical aggregated temporal-spatial data.

10. The method of claim 9, wherein the historical aggregated temporal spatial data comprises at least one of average time or probability to find next job, average price multiplier (surge), average fare or average revenue for each geographical area in a given time period.

11. The method of claim 1, wherein the optimization step calculates one or more of :

i) the expected notification compliance probability matrix of candidate service providers moving to each geographical area;

ii) an “average probability to find next job” matrix of service provider candidates moving to each different geographical area; and

iii) an "expected revenue" matrix of service provider candidates moving to each different geographical area.

12. The method of claim 1 wherein the optimization step is controllable to achieve one or more objectives selected from

i) minimize the total supply-demand imbalance for the whole area (country, city etc.);

ii) minimize the total driving distance for all service provider candidates;

iii) minimize the average time to find next job for all service provider candidates; and

(iv) maximize the average probability to find next job for all service provider candidates.

13 Apparatus for managing transport service providers, comprising data storage and a processor operating under control of stored instructions to:-

receive, in real time, a first data flow, the first data flow comprising data indicative of each of plural service providers, the data comprising an indication of the identity of each service provider, availability data of the respective service provider and an indication of location of each the respective service provider;

read, from the storage, historical supply/demand data process the first data flow together with the historical supply/demand data to provide a forecast of the number of service providers and number of services requests over an area comprising plural geographical zones, wherein the forecast is by zone;

filter the first data flow using availability criteria to output data indicative of candidate service providers, wherein the data indicative of each candidate service provider includes an indication of the identity of each candidate service provider associated with a location of the respective candidate service provider;

combine the data indicative of candidate service providers with the forecast number of service providers and number of service requests and calculate therewith a distance/time matrix of candidate service providers moving to each different zone from their current zone, thereby to establish a set of candidate service providers eligible to be moved from their current zone to respective new zone; and

output a respective notification to only each eligible service provider, the notification comprising an indication of a new location in a new zone, whereby the number of service providers in at least some zones converges on the number of service requests.

14. A computer program or computer program product comprising instructions for implementing the method of any one of claims 1 to 12.

15. A non-transitory storage medium storing instructions, which when executed by a processor cause the processor to perform the method of one of claims 1 to 12.