METHOD AND SYSTEM FOR DETERMINING OPTIMAL FULFILLMENT RATE

TECHNICAL FIELD

[0001] The present invention generally relates to a method for determining optimal fulfillment rate, and a system thereof, such as for online on-demand services, ride-hailing services or delivery services.

BACKGROUND

[0002] This background is provided for generally presenting the context of the disclosure. Contents of this background section are neither expressly nor implied admitted as prior art against the present disclosure.

[0003] In supply chain management, logistics and e-commerce, fulfillment rate is a key performance indicator that assesses how effectively and dependably a company completes consumer orders. It is calculated as the percentage of orders that are successfully processed and fulfilled within a specified time frame. Transport surge pricing is one of the most important levers to maintain supply and demand balance in a transportation service network and thus the overall system health, especially during peak demand and supply crunch situations. When demand for online on-demand services such as e-hailing transportation service exceeds the available supply, surge pricing mechanisms are implemented to ensure a consistent level of service fulfillment. The current available surge pricing mechanisms and methods entails an increase in transportation fares to incentivize more drivers to enter the market, thus meeting the heightened demand.

[0004] One of the current available system for determining contextual fulfillment rate and surge pricing such as disclosed in prior art US 20220261827A1 consists of a learning framework such as an integrated contextual bandit and temporal difference learning. The prior art generates price strategy and dispatch strategy based on future effects of implementing a pricing strategy and a dispatch strategy. The future effects include repositioning of a driver to optimize meeting demand and profit. However, in situations of extreme undersupply, surge pricing can lead to excessively high fares, which may be deemed exorbitant by users or passengers.

[0005] Consequently, during these peak demand periods, passengers or users may find themselves facing significantly inflated prices. In response to such pricing dynamics, passengers may opt to compromise on the reliability of the service, acknowledging that securing a ride is not guaranteed, in exchange for more affordable fares. This willingness

to tolerate potential service disruptions reflects a strategic trade-off wherein passengers prioritize cost savings over assured service availability.

[0006] It would be desirable to overcome or ameliorate at least one of the above-described problems, or at least to provide a useful alternative.

SUMMARY

[0007] According to a first aspect of the present invention, there is provided a method for determining optimal fulfillment rate. The method comprising obtaining historical data relating to uses of a service by one or more users for a geographic region over a time period, and provision of the service by one or more providers, predicting a predicted fulfilment rate as a function of contextual information and model of a distance per fare, provision of the service by one or more providers and acceptance of the service from one or more users, based on the historical data; determining maximum estimated long-term value (LTV) as a function of the predicted fulfilment rate and the distance per fare; calculating an optimized fulfilment rate based on the predicted fulfilment rate and maximum estimated LTV, receive one or more searches for provision of the service, each search being made by a respective further user. For each search, calculate a price for provision of the service, in accordance with the search and the optimized fulfilment rate, present the corresponding said further user with the said price, and on acceptance of the price by the further user, transmitting an order corresponding to the search and the price to the one or more providers, calculating an actual fulfilment rate based on acceptance of the orders by the one or more service providers, and updating the optimized fulfilment rate based on the actual fulfilment rate.

[0008] Preferably, the contextual information consists of current market conditions such as geohash location and time, and associated provision and acceptance of the service at the current market conditions.

[0009] Preferably, the method wherein calculating a price for provision of the service, in accordance with the search and the optimized fulfilment rate comprises: determining price based on the function, a number of searches and a target fulfilment rate; and if an acceptance rate for the acceptance of the price by the further users is below a target acceptance rate, the target fulfillment rate is modified.

[0010] Preferably, the target acceptance rate corresponds to target fulfillment rate.

[0011] Preferably, the estimation of LTV is aggregated in accordance with for contextual information corresponding to the contextual information used to determine the predicted fulfillment rate.

[0012] According to a second aspect of the present invention, there is provided system for determining optimal fulfillment rate, the system comprising memory, a database, at least one processor and wherein the memory stores instructions that, when executed by the at least one processor, cause the at least one processor to obtain historical data relating to uses of a service by one or more users for a geographic region over a time period, and provision of the service by one or more providers from the database, predict a predicted fulfilment rate as a function of contextual information and model of a distance per fare, provision of the service by one or more providers and acceptance of the service from one or more users, based on the historical data; determine a maximum estimated long-term value (LTV) as a function of the predicted fulfilment rate and the distance per fare; calculate an optimized fulfilment rate based on the predicted fulfilment rate and maximum estimated LTV, receive one or more searches for provision of the service, each search being made by a respective further user. For each search: calculate a price for provision of the service, in accordance with the search and the optimized fulfilment rate, present the corresponding said further user with the said price, and on acceptance of the price by the further user, transmitting an order corresponding to the search and the price to the one or more providers, calculate an actual fulfilment rate based on acceptance of the orders by the one or more service providers and update the optimized fulfilment rate based on the actual fulfilment rate.

[0013] Preferably, the contextual information consists of geohash location and time, and associated provision and acceptance of the service at the current market conditions.

[0014] Preferably, the estimation of LTV is aggregated in accordance with contextual information corresponding to the contextual information used to determine the predicted fulfillment rate.

BRIEF DESCRIPTION OF THE DRAWINGS

[0015] Embodiments of the present invention will be better understood and readily apparent to one of ordinary skill in the art from the following written description, by way of example only, and in conjunction with the drawings, in which:

Figure 1a illustrates a line graph that represents theoretical willingness of user or passenger to trade-off affordability with reliability to maintain the same long-term value (LTV);

Figure 1b illustrates a line graph that represents market frontier theoretical relationship between affordability and reliability of an online on-demand service;

Figure 1c illustrates a line graph that represents theoretical relationship between affordability-reliability the present invention;

Figure 2 depicts a schematic flow diagram of a method for computing contextual spatial-temporal optimal fulfillment rate for online on-demand service, according to various embodiments of the present invention;

Figure 3 depicts a schematic block diagram of an exemplary computer system that may be used to realize or implement the system for determining optimal fulfillment rate, according to various embodiments of the present invention.

DETAILED DESCRIPTION

[0016] Various embodiments of the present invention provide a method and a system for determining optimal fulfillment rate, such as for online on-demand services, ride-hailing services or delivery services.

[0017] As explained in the background, there are existing systems for determining surge pricing and contextual fulfillment rate during surge. However, such existing systems suffer from various drawbacks or deficiencies, including excessively high fares in case of extreme undersupply, which may be deemed exorbitant by passengers. In this regard, various embodiments of the present invention provide a method of determining contextual fulfillment rate, and more particularly, with improved long term value (LTV). The method also improves implementation efficiencies and costs.

[0018] Hereinafter, the system and method according to the present invention will be described in detail with reference to Figure 1a through Figure 3 according to the preferred embodiments. It is to be understood that limiting the description to the preferred embodiments of the invention is merely to facilitate discussion of the present invention and it is envisioned without departing from the scope of the appended claims.

[0019] The present invention discloses a preferred embodiment of a method and system for determining optimal fulfillment rate to achieve maximized LTV. Figure 1a is a line graph that represents theoretical relationship between affordability (distance per fare in Km per dollar) and reliability of the service, from passenger or user's perspective. LTV is a lifetime value formula that measures how beneficial a customer relationship is. This considers actions such as purchase frequency and positive engagement with marketing

efforts. It should consider how the customer feels about a business, products and service positively.

[0020] As shown in Figure 1a, if the affordability or distance per fare (in Km per dollar) is high, the passenger or user would be more willing to accept a suggested fare or more likely to place an order. However, the service providers or drivers are less likely or less willing to accept the placed order (resulting in low reliability) especially during high surge or peak demand. *Vice versa*, when the affordability or distance per fare is low, the passenger or user would be less likely to place an order or less willing to accept a suggested fare but the service providers or drivers are more likely to accept a placed order (resulting in high reliability). The two plotted lines in Figure 1a represent two LTV values.

[0021] Pricing for provision of service has traditionally worked on the assumption that passengers or users always prefer a high level of reliability. This is not always necessarily true. When supply is too constrained, prices may get too high in order to support high reliability. In those instances, passengers could prefer to get lower prices, coupled with slightly lower reliability.

[0022] For example, when there is a surge of demand for transportation service where there are not many service providers or drivers in the area during that particular time, pricing will increase which can result in lack of affordability. During periods of extreme undersupply, this could result in exorbitant prices. From a customer's perspective, while the service remains reliable as it is highly likely that a driver or service provider would be willing to accept their order, the extreme lack of affordability comes at a detriment to their experience and hence could result in low LTV. Exorbitant prices could also lead to customer not placing an order for the service, and to accept and use another alternative. This willingness to put up with possible interruptions in service is a result of a strategic trade-off made by passengers who value financial savings over guaranteed service availability.

[0023] Figure 1b illustrates a line graph that represents a theoretical relationship between affordability or distance per fare (in Km per dollar) and reliability of a transportation service from the perspective of a driver or a service provider. Reliability of a transportation service from the perspective of a driver or a service provider could also mean their likelihood or willingness to accept a placed order by a passenger. A scenario would be such that during high surge or peak demand, if the affordability or distance per fare is high, the service providers or drivers might be less likely or less willing to accept the placed order resulting in lower fulfillment rate (FR). However, if the affordability or distance per fare is low, more of the service providers or drivers would be likely to accept or willing to accept the order, resulting in higher FR.

[0024] When supply is too constrained, prices may get too high in order to support high reliability in order to achieve a certain target allocation rate (AR) set by the service provider company. During periods of undersupply and passengers feel prices are too unaffordable, the service provider company might choose to tune the target AR down slightly, so that prices are more affordable but reliability is slightly worse. However, this process is highly manual and the exact magnitude of how much to move the target AR is often decided through trial and error. In a preferred embodiment, target AR is a proximate signal of FR in real time.

[0025] Figures 1a and 1b can be assumed, on the basis of supply and demand. Users want to pay as little as possible for a service, and accepting the service will therefore become decreasingly attractive as the price for the service increases. Service providers want to do as little as possible for the payment, and providing the service will therefore become decreasingly attractive as the price for the service decreases. In some embodiments, the graphs of Figures 1a and 1b are determined from historical data. That data may be taken over a predetermined, recent period (e.g. the last 5 minutes, day, week or other period) and/or relate to rides taken over times of corresponding contextual information. For example, when predicting fulfilment rate at lunchtime on a weekday, the historical data may be taken from lunchtimes of the weekdays of the previous week. In another example, data from comparable event periods may be used for events such as Christmas day, Chinese new year, Singapore national day and others. Moreover, the contextual information may take into account the origin and destination of rides. In this case, the fulfilment rate may be determined for particular origin and destination combinations – e.g., departing the central business district (origin) and driving to a nearby landmark (destination).

[0026] Figure 1c illustrates a line graph that combines the user or passenger's perspective together with the service provider's perspective in theoretical relationship between affordability or distance per fare, and service reliability, as disclosed in the present invention. There is an intersection of the user graph and service provider graph, which indicates the optimal trade-off between reliability (optimal fulfillment rate) and affordability (optimal price).

[0027] The present invention seeks to optimize LTV by maximizing fulfilment as a function of contextual information, distance per fare, provision of the service by one or more providers (as reflected in historical data and, after initial optimisation, further data generated by further rides or provision of services) and acceptance of the service by users.

[0028] In some embodiments, the LTV is modelled by defining the fulfilment rate as a function of affordability for both service providers and users, per Figures 1a and 1b. This model can be approximated by the following mathematical formulation, in which maximum LTV can be found by:

$$Max\ LTV = A * FR^{\beta_{FR}} * Aff^{\beta_{Aff}}$$
$$s.t. FR = \alpha_{Aff} Aff + \alpha_d D + \alpha_s S + \alpha_{hod} HOD + \alpha_{dow} DOW + \alpha_{loc} LOC + \alpha_0$$

(Equation 1)

[0029] In Equation (1), LTV is long term value which is usually 3-month gross merchandise value (GMV) though other periods can be used, Aff is affordability and defined by distance per fare, FR is fulfillment rate, D is demand, S is supply, DOW is day of week, HOD is hour of day and LOC is geohash location. A is a coefficient for passenger's long term value (in dollars) per unit of (fulfilment rate * distance per fare). When coefficient "A" is multiplied with the FR * Aff, it yields the Max LTV.

[0030] β_{FR} and β_{Aff} are parameters of optimal fulfillment rate and optimal affordability (or price) respectively. The values of both β_{FR} and β_{Aff} are related to optimal LTV (optimal trade-off between reliability (optimal fulfillment rate, β_{FR}) and affordability (optimal price, β_{Aff})) and are approximated from historical data.

[0031] Log transformation is applied for both left side and right side of objective function in Equation 1 to obtain:

$$log(LTV) = log(A) + \beta_{FR} log(FR) + \beta_{Aff} log(Aff)$$

Replacing Aff in the function above with the constraint leads to:

$$log(LTV) = log(A) + \beta_{FR} log(FR) + \beta_{Aff} log(FR - (\alpha_d D + \alpha_s S + \alpha_{hod} HOD + \alpha_{dow} DOW + \alpha_{loc} LOC + \alpha_0)/\alpha_{Aff})$$

To maximize $log(LTV)$ with respect to FR, the derivative on FR is made to equal to 0, which is:

$$\beta_{FR} \frac{1}{FR} + \beta_{Aff} \frac{1}{FR - (\alpha_d D + \alpha_s S + \alpha_{hod} HOD + \alpha_{dow} DOW + \alpha_{loc} LOC + \alpha_0)} = 0$$

After rearrangement, a closed form solution for optimal FR is as follows:

$$FR^* = \frac{\beta_{FR}}{(\beta_{FR} + \beta_{Aff})} (\alpha_d D + \alpha_s S + \alpha_{hod} HOD + \alpha_{dow} DOW + \alpha_{loc} LOC + \alpha_0)$$

(Equation 2)

[0032] In accordance to a preferred embodiment, to compute the optimal FR^*, the prediction of FR as a function of affordability is required, along with some contextual information, like location, time (hour of day, day of week), supply and demand. Contextual information may be extended to use more features.

[0033] Further, the estimation of LTV as a function of FR and affordability is also required. This LTV should be aggregated at area-time level similar to the FR prediction.

[0034] Finding optimal FR is a solution to finding the preferred mix between affordability and reliability. In another embodiment for different marketplace conditions, optimal FR may consists of different combinations of affordability and reliability, and chooses the combination that maximizes passenger utility. Notably, a single market may concurrently have multiple different optimal FRs. Each FR may be used when servicing orders between a respective pair of geohashes – a region that includes the origin of the ride and a region that includes the destination of the ride – or for different ride types – e.g., standard, ride share, premium or executive service levels. There are three (3) benefits to finding optimal FR, which includes i) precision, as to what magnitude of changes are required in moving target AR (real time FR), ii) faster feedback loop, as service provider company does not have to wait to realize that there are fundamental changes in the marketplace situation, and iii) more granularity, as optimal FR is adjustable for different area-times, based on the marketplace conditions within that area-time itself.

[0035] Figure 2 discloses a method for determining optimal fulfillment rate, 200. The method comprises obtaining historical data relating to uses of a service by one or more users for a geographic region over a time period or hour of day, and provision of the service by one or more providers (step 210). That period may be determined as discussed above, based on a most recent period of time (e.g., the last 24 hours) or a comparable period (e.g., same day in previous week or same event such as Christmas).

[0036] Next, a fulfilment rate is predicted (step 240) as a function of contextual information and a model of distance per fare (i.e., affordability), provision of the service by one or more providers and acceptance of the service from one or more users, based on the historical data. The model may have been previously calculated. However, in the embodiment shown in Figure 2, step 240 is preceded by generating the model. The model is generated by combining two functions, a first function is generated at step 220, by generating a market graph defining a relationship between affordability or distance per fare and provision of the service by one or more providers or reliability. In other words, the willingness of a driver (service provider) to undertake to provide a ride (the service)

based on the price offered for that ride. This graph is generated based on the historical data. Thus, reliability in the context of the market graph would mean willingness of a driver or a service provider to accept a placed order by a user or to provision the service. Similarly, step 230 comprises generating a user graph defining a relationship between affordability or distance per fare and acceptance of the service for one or more users. In other words, the willingness of a user (rider) to accept a ride (agree to pay for the ride) at the proposed price. Again, this is based on the historical data. Reliability in terms of the user graph would mean willingness of a user or passenger to accept a suggested price and to place an order for the service.

[0037] The two graphs (which may similarly be represented non-graphically, using mathematical approximations) are then combined into the model, per Figure 1c. This enables the intersection of the graphs to be identified. If not intersection is present, the model may identify the point at which the two graphs are closest.

[0038] At step 240, the predicted fulfilment rate is predicted based on the contextual information, the distance per fare (e.g., kilometres per dollar) and the model. Thus, the predicted fulfilment rate is based, in the embodiment shown, on the market graph and the user graph, which leverage the historical data. Contextual information may include information such as geohash location and time (hour of day, day of week), and supply and demand as reflected by provision and acceptance of the service at the current market conditions. Contextual information may include any other current market conditions, including events such as Christmas, Hari Raya, public holidays and so on.

[0039] An estimated long-term value (LTV) is estimated as a function of the predicted fulfilment rate and distance per fare or affordability at step 250. This is maximized by finding the point at which the rate of change of the FR is 0. At step 260, an optimized fulfilment rate is calculated based on the predicted fulfilment rate and estimated LTV.

[0040] Further, at step 270, one or more searches are received for provision of the service, each search being made by a respective further user. These searches are new requests for rides, made by users of a ride-hailing service, for example. Each request is made at, or for, a particular departure time, from an origin geohash (specific point or specific point in a region) to a destination geohash. Each request may also include a ride service level and other information. For each search, a price for provision of the service is calculated, in accordance with the search and the optimized fulfilment rate – as set out above, there may be multiple optimized fulfilment rates, each being calculated for (and used for) requests having particular parameters – e.g. time of ride, origin, destination and others. For each request, the further user that made the request is presented with the

corresponding price. On acceptance of the price by the further user, an order is transmitted corresponding to the search and the price to the one or more providers.

[0041] Step 280 relates to calculating an actual fulfilment rate based on acceptance of the orders by the one or more service providers. This is a straight-forward calculation of the proportion of rides accepted by users relative to the number of rides offered to those users. Finally, the optimized fulfilment rate is updated based on the actual fulfilment rate as per step 290. This updating step may comprise applying a weight to a difference between the optimized fulfilment rate and the actual fulfilment rate, and adding the resultant value to the optimized fulfilment rate. In this way, a progressive adjustment is made rather than making step changes based service acceptance and provision over a short period – i.e., using an unweighted value assumed to be ground truth. Alternatively, the model calculated by combining the graphs generated at steps 220 and 230 may be updated using the actual fulfilment rate, weighted or otherwise.

[0042] Further, the updated optimized fulfillment rate is applied to new searches for provision of the service from one or more further users or passengers.

[0043] In a preferred embodiment, a number of ride requests are received and the price for provision of the service is determined based on the function used to calculate the fulfilment rate at step 240, the number of searches and a target fulfillment rate (or allocation rate) as shown in step 271 of Figure 2. Target fulfillment rate or allocation rate is determined by the service provider, as the real-time desired or target value or proportion of passengers being matched to drivers – i.e., orders, generated by passengers, being accepted by drivers. The determined price is then displayed for passengers to accept. However, if the passengers feel that the price is too high, they may not place any orders. Therefore, an acceptance rate is calculated from the number of searches converting into orders. The target acceptance rate is also determined by the service provider, as the target rate in which the number of searches are converted into orders. In general, the lower the price the more attractive the service and the higher the acceptance rate by the user. Thus, price and acceptance rate are roughly inversely proportional. If the acceptance rate for acceptance of the price by further users (e.g., the acceptance rate for all users over a particular time period, such as 1 minute) is below the target acceptance rate, the target fulfillment rate or allocation rate is modified (step 272). This then modifies the price calculated for subsequently place searches.

[0044] The target fulfilment rate and/or the target acceptance rate may be manually set, determined by the service provider, as set out above, or determined to be the rate

that maximises gross merchandise value, LTV, driver utilisation, or another quantity, based on historical data.

[0045] Figure 3 shows an example architecture of a computer system 300 that may be used to realize or implement the system for determining optimal fulfillment rate.

[0046] According to Figure 3, the system comprises at least one processor 102, memory 104 accessible to the processor 302 and a network interface 308 to facilitate communication with a plurality of driver's computing devices 350 and a user's computing device 370. Program code 306 provided in memory 304 comprises instructions executable by the processor 302 to perform at least a part of the method of the embodiments described herein. Notably, while individual computer systems are described in Figure 3, any such computer system may be distributed across multiple servers or multiple devices, or some functionality may be consolidated into a single server or device, without departing from the purposive intent of the present disclosure.

[0047] The driver's computing device 150 is associated with a specific driver 340. The driver's computing device 350 comprises at least one processor 352, a memory 354, a GPS device 357 and a network interface 359. The memory 354 comprises program code 356 comprising instructions executable by the processor 352 to facilitate interactions with the order system 300. The user's computing device 370 comprises one or more processors 372, a memory 374, a GPS device 377 and a network interface 379. The memory 374 comprises program code 376 comprising instructions executable by the processor 372 to facilitate interactions with the system 300. The driver's computing device and the user's computing device may include a personal or handheld computing device such as a smartphone or a tablet. Network 330 facilitates communication between the various devices and may include one or more communication networks including the internet, cell phone networks etc.

[0048] One or more database 320 are also accessible to the system 300. The database 320 comprises records of historical data relating to uses of a service by one or more users for a geographic region over a time period, and provision of the service by one or more providers. The one or more database 320 are able to interact directly with the computing system 300.

[0049] It will be appreciated that many further modifications and permutations of various aspects of the described embodiments are possible. Accordingly, the described aspects are intended to embrace all such alterations, modifications, and variations that fall within the scope of the appended claims.

[0050] Throughout this specification and the claims which follow, unless the context requires otherwise, the word "comprise", and variations such as "comprises" and "comprising", will be understood to imply the inclusion of a stated integer or step or group of integers or steps but not the exclusion of any other integer or step or group of integers or steps.

[0051] The reference in this specification to any prior publication (or information derived from it), or to any matter which is known, is not, and should not be taken as an acknowledgment or admission or any form of suggestion that that prior publication (or information derived from it) or known matter forms part of the common general knowledge in the field of endeavour to which this specification relates.

CLAIMS

1. A method for determining optimal fulfillment rate, comprising:

obtaining historical data relating to uses of a service by one or more users for a geographic region over a time period, and provision of the service by one or more providers;

predicting a predicted fulfilment rate as a function of contextual information and model of a distance per fare, provision of the service by one or more providers and acceptance of the service from one or more users, based on the historical data;

determining maximum estimated long-term value (LTV) as a function of the predicted fulfilment rate and the distance per fare;

calculating an optimized fulfilment rate based on the predicted fulfilment rate and maximum estimated LTV;

receiving one or more searches for provision of the service, each search being made by a respective further user; and

for each search:

calculate a price for provision of the service, in accordance with the search and the optimized fulfilment rate;

present the corresponding said further user with the said price; and

on acceptance of the price by the further user, transmitting an order corresponding to the search and the price to the one or more providers;

calculating an actual fulfilment rate based on acceptance of the orders by the one or more service providers; and

updating the optimized fulfilment rate based on the actual fulfilment rate.

2. The method as claimed in claim 1, wherein the contextual information consists of current market conditions such as geohash location and time, and associated provision and acceptance of the service at the current market conditions.

3. The method as claimed in claim 1, wherein calculating a price for provision of the service, in accordance with the search and the optimized fulfilment rate comprises:

determining price based on the function, a number of searches and a target fulfilment rate; and

if an acceptance rate for the acceptance of the price by the further users is below a target acceptance rate, the target fulfillment rate is modified.

4. The method as claimed in claim 1, wherein the target acceptance rate corresponds to target fulfillment rate.

5. The method as claimed in claim 1, wherein the estimation of LTV is aggregated in accordance with for contextual information corresponding to the contextual information used to determine the predicted fulfillment rate.

6. A system for determining optimal fulfillment rate, the system comprising:

memory;

a database;

at least one processor; and

wherein the memory stores instructions that, when executed by the at least one processor, cause the at least one processor to:

obtain historical data relating to uses of a service by one or more users for a geographic region over a time period, and provision of the service by one or more providers from the database;

predict a predicted fulfilment rate as a function of contextual information and model of a distance per fare, provision of the service by one or more providers and acceptance of the service from one or more users, based on the historical data;

determine a maximum estimated long-term value (LTV) as a function of the predicted fulfilment rate and the distance per fare;

calculate an optimized fulfilment rate based on the predicted fulfilment rate and maximum estimated LTV;

receive one or more searches for provision of the service, each search being made by a respective further user; and

for each search:

calculate a price for provision of the service, in accordance with the search and the optimized fulfilment rate;

present the corresponding said further user with the said price; and

on acceptance of the price by the further user, transmitting an order corresponding to the search and the price to the one or more providers;

calculate an actual fulfilment rate based on acceptance of the orders by the one or more service providers; and

update the optimized fulfilment rate based on the actual fulfilment rate.

7. The system as claimed in claim 6, wherein the contextual information consists of geohash location, time and time, and associated provision and acceptance of the service at the current market conditions.

8. The system as claimed in claim 6, wherein the estimation of LTV is aggregated in accordance with contextual information corresponding to the contextual information used to determine the predicted fulfillment rate.

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