

RIDE ALLOCATION SYSTEM

Technical Field

The present disclosure relates, in general terms, to systems for performing ride allocation. More specifically, the present disclosure relates to systems for allocating rides by reaching out to drivers who may not have previously enabled certain ride types, providing new job opportunities for these drivers.

Background

This background description is provided for the purpose of generally presenting the context of this disclosure. Contents of this background section are neither expressly nor impliedly admitted as prior art against the present disclosure.

In many popular ride hailing services, drivers are provided with an option to enable or disable a number of ride types, depending on their driving habits and vehicle preferences. This may include, but is not limited to, a personal-hire vehicle (PHV), a commercial taxi, a premium personal-hire vehicle, a vehicle which can accommodate up to six passengers (instead of up to four), and a vehicle which can accommodate a child seat.

A driver of a commercial taxi may prefer to accept taxi only bookings, while disabling ride requests for personal-hire vehicles, due to a perception that metered fares generally lead to higher earnings than a fixed fare, the latter being used in personal-hire vehicles. A driver of a six-passenger vehicle may prefer to accept ride requests for a six-seater vehicle, while disabling ride requests for personal-hire vehicles or commercial taxis, due to a six-seater vehicle hire providing a higher fare, thus increasing the earnings.

Despite the perception of higher earnings in metered fares over fixed fares, or in a six-seater vehicle hire over a four-seater vehicle hire, there are often other factors which may affect a driver's earnings for the day. For instance, accepting a fixed fare job request during a period of low demand would be advantageous, when compared to not receiving a job of a preferred ride type. Similarly, accepting a four-seater vehicle hire job request when at a location of low ride demand would be advantageous, when compared to idling while waiting for a six-seater vehicle hire job request.

It is therefore necessary for a system for performing ride allocation to broadcast more (or all) ride requests to a driver, rather than ride requests corresponding only to the preferred ride type, to both maximise a driver's earnings and increase the ride requests which are successfully allocated.

Summary

Disclosed herein is a system for performing ride allocation, comprising:

- a receiver module which receives a ride request, wherein the ride request comprises an origin and a destination;
- a processor which generates and outputs, for each ride type of a plurality of ride types, one or more ride parameters;
- a request module which receives a selection of a request ride type, the request ride type being a ride type from the plurality of ride types, and generates a job request corresponding to the selection;
- an evaluation module which compares the one or more ride parameters of the request ride type to a corresponding one or more ride parameters of a further ride type, the further ride type being a ride type from the plurality of ride types which is not the request ride type; and if the one or more ride parameters of the request ride type is higher than a corresponding one or more ride parameters of a further ride type, generates a notification comprising the ride request, and broadcasts the notification to one or more drivers in a corresponding one or more vehicles that are eligible to accept the request ride type and have the request ride type disabled; and

an allocation module which allocates a job corresponding to the job request to a driver, upon receipt of acceptance of the job request by the driver of a said vehicle.

In some embodiments, the one or more drivers are located within a predetermined distance or travel time of the origin.

In some embodiments, for each of the one or more drivers, the system determines eligibility in respect of each ride type.

In some embodiments, the one or more ride parameters comprises a ride fare pricing for the ride request.

In some embodiments, the one or more ride parameters comprises a demand at the origin and a demand at the destination, for a ride type that the one or more drivers has enabled, wherein the demand at the destination exceeds the demand at the origin.

In some embodiments, the ride fare pricing is expressed as a sum of a base fare value and a bonus fare value.

In some embodiments, the bonus fare value is generated based on the demand at the origin and/or the demand at the destination.

In some embodiments, prior to broadcasting the notification, the job request is advertised to one or more drivers that have the request ride type enabled.

In some embodiments, receipt of acceptance of the job request by the driver of a said vehicle comprises an active intervention by the driver to accept the job.

In some embodiments, broadcasting the notification further comprises broadcasting a "no penalty" alert.

In some embodiments, broadcasting the notification further comprises broadcasting the one or more ride parameters of the request ride type which is

higher than a corresponding one or more ride parameters of a ride type, from the plurality of ride types, that the one or more drivers has enabled.

Disclosed herein is also method for performing ride allocation, comprising:

receiving a ride request, wherein the ride request comprises an origin and a destination;

generating and presenting an output, for each ride type of a plurality of ride types, one or more ride parameters;

receiving a selection of a request ride type, the request ride type being a ride type from the plurality of ride types, and generating a job request corresponding to the selection;

comparing the one or more ride parameters of the request ride type to a corresponding one or more ride parameters of a further ride type, the further ride type being a ride type from the plurality of ride types which is not the request ride type; and if the one or more ride parameters of the request ride type is higher than a corresponding one or more ride parameters of a further ride type, generating a notification comprising the ride request, and broadcasting the notification to one or more drivers in a corresponding one or more vehicles that are eligible to accept the request ride type and have the request ride type disabled; and

allocating the job corresponding to the job request to a driver, upon receipt of acceptance of the job request by the driver of a said vehicle.

In some embodiments, the one or more drivers are located within a predetermined distance or travel time of the origin.

In some embodiments, the one or more ride parameters comprises a ride fare pricing, wherein the ride fare pricing is expressed as a sum of a base fare value and a bonus fare value.

In some embodiments, the one or more ride parameters comprises a demand at the origin and a demand at the destination, for a ride type that the one or more drivers has enabled, wherein the demand at the destination exceeds the demand at the origin.

In some embodiments, prior to broadcasting the notification, the job request is advertised to one or more drivers that have the request ride type enabled.

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In some embodiments, receipt of acceptance of the job request by the driver of a said vehicle comprises an active intervention by the driver to accept the job.

In some embodiments, broadcasting the notification further comprises broadcasting a "no penalty" alert.

In some embodiments, broadcasting the notification further comprises broadcasting the one or more ride parameters of the request ride type which is higher than a corresponding one or more ride parameters of a ride type, from the plurality of ride types, that the one or more drivers has enabled.

Brief description of the drawings

Some embodiments of the systems for this invention, in accordance with the present disclosure, will now be described, by way of non-limiting example only, with reference to the accompanying drawings, in which:

Figure 1 illustrates a block diagram of a system for ride allocation and its associated components; and

Figure 2 illustrates a flowchart for performing ride allocation.

Detailed description

Embodiments of the present disclosure relate to a system for performing ride allocation, the system broadcasting rides to drivers who may have a particular ride type disabled (herein interchangeably referred to as an alternate ride type), then subsequently processing acceptance of rides by said drivers.

Figure 1 illustrates a block diagram of a system for ride allocation and its associated components. An allocation system 100 comprises at least one processor 102, memory 104 accessible to the processor 102 and a network interface 108 to facilitate communication with a plurality of driver's computing devices 150 and a user's computing device 160. Program code 106 provided in memory 104 comprises instructions executable by the processor 102 to perform at least a part of the method of the embodiments described herein. Notably, while individual computer systems are described in Figure 1, 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.

The driver's computing device 150 is associated with a specific vehicle 140 driven by the respective driver. References to a "driver" will be considered to be references to a "vehicle", namely that driven by the driver, and vice versa (i.e. the two terms may be used interchangeably), unless context dictates otherwise. This equality is made in view of a vehicle necessarily having a driver, and a driver requires a vehicle to be so. The driver's computing device 150 comprises at least one processor 150, a memory 154, a GPS device 157 and a network interface 159. The memory 154 comprises program code 156 comprising instructions executable by the processor 152 to facilitate interactions with the ride allocation system 100. The user's computing device 160 comprises one or more processors 162, a memory 164, a GPS device and a network interface 169. The memory 164 comprises program code 166 comprising instructions executable by the processor 162 to facilitate interactions with the ride allocation system 100. 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 130 facilitates communication between the various devices and may include one or more communication networks including the internet, cell phone networks etc.

One or more databases 120 are also accessible to the system 100. The database 120 comprises passenger and driver records. The records may include historical data relating to rides taken by passengers or rides provided by drivers and associated information. The historical data relating to the drivers may include time, date of the ride, origin, destination of the ride, the drivers' vehicle information and ride type eligibility, as well as historical ride cancellations or delays. Historical data can also comprise a number of trips departing from or arriving at particular geohashes at various time, or time periods – that number being the equivalent of demand.

Figure 2 illustrates a flowchart for performing ride allocation (200) of the present disclosure. The system for performing ride allocation (100) comprises a receiver module (202), a processor (204), a request module (206), an evaluation module (208) and an allocation module (210).

The receiver module (202) receives an incoming ride request. The ride request comprises parameters about or associated with the ride, including an origin and a destination of the requested ride. The ride request may also include a requested pick-up time, for rides scheduled in advance. The ride request may also include a number of passengers or other data relating to a particular ride.

The processor (204) receives the parameters and generates, for a plurality of ride types, a further one or more ride parameters. The further parameters are those that are necessary, or those that in addition to the parameters contained in the ride request are necessary, to define the ride in sufficient detail to generate a job for drivers to accept. A ride type typically refers to a choice of type of vehicle or service which is offered to a ride requester or passenger. This may include, but is not limited to, the type of vehicle (personal hire car, personal hire premium car, or commercial taxi), an option to share a ride, or the amenities available (child seat, room for a personal mobility vehicle, wheelchair hoist, or room to accommodate a pet). The further one or more ride parameters, including, but not limited to, a ride fare for each of the plurality of ride types, a ride request demand level at the origin

and a ride request demand level at the destination of the requested ride, or an estimated drop-off time. The processor then outputs the further one or more ride parameters. The ride fare for each of a plurality of ride type may be displayed to a ride requester and one or more drivers.

Throughout this specification and the claims which follow, unless the context requires otherwise, the term "ride fare", and variations such as "ride fare pricing" and "fare", refers to the amount a ride requester (i.e. a passenger) will pay for the ride.

The request module (206) receives a selection of a request ride type as preferred or selected by the ride requester, the request ride type being one of the plurality of ride types. The ride requestor may make this selection based on the generated ride fare and/or the estimated pick-up time and drop-off time. The estimated pick-up time and drop-off time may depend on the availability of drivers at the origin, as well as the traffic conditions along a proposed route of travel.

Once a ride type is selected, the allocation module (210) generates a job. Jobs are subsequently offered or broadcast to drivers for acceptance. In general, a driver will have jobs broadcast to them if they are eligible to accept the job and they have the particular ride type enabled. Eligibility is determined by reference to the type of vehicle driven by the driver. In particular, a standard vehicle such private hire car, can accept standard jobs only. A metered taxi may accept standard jobs and metered fare jobs. A premium vehicle may accept premium jobs and standard jobs, and so on. A driver may then choose to enable or disable ride types. In the past, when a particular ride type is disabled, drivers will not receive jobs for rides of that ride type. While a driver of a standard vehicle may only have one ride type for which they are eligible, and thus must have it enabled, drivers of premium vehicles may disable a ride type. For example, a driver of a premium vehicle may disable standard vehicle jobs – some drivers may do so if the perceived earnings from standard car jobs is less than that of premium car jobs – thereby, traditionally, only having jobs advertised for the premium vehicle type.

In the present system, notifications corresponding to a ride request may be broadcast to drivers even if a driver has the ride type disabled, if the ride request is advantageous for the driver to accept. In this regard, the evaluation module (208) first compares the one or more ride parameters of the request ride type to a corresponding one or more parameters of a further ride type, the further ride type referring to a ride type from the plurality of ride types which is not the request ride type. The evaluation module may compare, for instance, a ride fare for the request ride type (which a driver may have disabled) and a corresponding ride fare for the ride type which a driver has enabled. If a driver has the request ride type disabled but the ride fare of the ride request is higher than the corresponding fare of a ride type that the driver has enabled (whether for the same ride parameters or when compared with rides currently available to the driver for enabled ride types), it may be advantageous for the ride request to be presented or broadcast to the driver. The driver can then accept the ride request even if the driver has not previously enabled the request ride type. Notably, the notification may first be broadcast to drivers that have the request ride type enabled.

Throughout this specification and the claims which follow, unless the context requires otherwise, the term "enabled" and variations such as "enable" and "enabling" with respect to one or more ride types, shall be taken as a driver in a corresponding vehicle activating a driver preference to take on jobs of a particular one or more ride types. This may be due in part to, an underlying assumption on how certain ride types may benefit them, or it may be due in part to operating a vehicle which may only satisfy requirements of certain ride types.

As mentioned above, the evaluation module generates a notification corresponding to the ride request. In order to reach as many drivers as possible who have the request ride type disabled, the notification comprising the ride request may be broadcast at the same time to multiple drivers. Since the drivers have had the request ride type disabled, there may be a delay in the driver accepting the ride request, or there may be an overall lower take-up rate. Consequently, broadcasting it to multiple drivers at the same time decreases the delay between generation of the notification and acceptance by a driver.

It shall be understood that broadcasting a notification comprising a ride request refers to broadcasting the notification to a mobile device of a driver of a corresponding vehicle.

If more than one driver has indicated an acceptance in a notification, the job will be allocated to a driver according to a predetermined set of considerations. This may include allocating it to a driver with the shortest travel distance or shortest travel time of the origin. It may also include allocating it to a driver with a high acceptance rate and low cancellation rate based on their job allocation history.

The allocation module (210) then allocates a job corresponding to the notification to a driver, upon receipt of acceptance of the job request by the driver of a said vehicle.

Nomination of non-active drivers

In some embodiments, the one or more drivers in a corresponding one or more vehicles that have the request ride type disabled are located within a predetermined distance or travel time of the origin. The predetermined radius may be 500 m, or it may be tailored according to the supply of drivers in the vicinity. The predetermined travel time of the origin may be four minutes or less, or it may be tailored during a peak period accordingly.

In some embodiments, the one or more drivers have a preferred ride type and would hence have enabled the said ride type as a driver preference.

Throughout this specification and the claims which follow, unless the context requires otherwise, the term "eligible" and variations such as "eligibility" with respect to one or more ride types, shall be taken as a driver in a corresponding vehicle satisfying the requirements of a particular one or more ride types. For instance, a driver who has indicated a preference for job requests corresponding to a request ride type of a six-seater vehicle, i.e., enabled requests for six-seater

vehicles, is eligible to take on a ride request for a four-seater vehicle. Similarly, a driver who has indicated a preference for job requests requiring a child seat is eligible to take on a ride request not requiring a child seat. It shall be understood that broadcasting the notification for a job request will not be carried out to one or more drivers that may have the request ride type disabled, should the said driver be ineligible to take on the said job request. For instance, a driver operating a standard four-seater vehicle would be ineligible to accommodate ride requests for a six-seater vehicle.

It shall be understood that broadcasting the notification for a job request to a one or more drivers that have the request ride type disabled involves broadcasting the notification to only one or more drivers who are eligible to take on the said job request – i.e., the request ride type is one of the said driver's alternate ride type. It shall be understood that an eligibility of a driver to take on a ride request corresponding to a certain ride type implies that the said driver operates a vehicle which is eligible to operate the said ride type.

In some embodiments, the one or more ride parameters of the ride request comprises, in addition to the origin and destination, a ride fare pricing for the ride request. The ride fare pricing is generated by the processor 104 for a plurality of ride types. The ride fare pricing may comprise a base fare value and a bonus or a surge fare. The base fare value may be extracted from the lowest of all fares generated over a plurality of ride types, for a particular origin and a particular destination corresponding to the present ride request. The bonus or surge fare may be evaluated as a percentage mark-up of the base fare value, to account for provisions in providing a premium vehicle, providing a vehicle which can accommodate more passengers, or providing a vehicle with additional amenities such as a child seat. The bonus or surge fare may also be evaluated based on the present ride request demand at the origin and the present ride request demand at the destination.

In some embodiments, the one or more ride parameters further comprises a ride request demand at the origin and a ride request demand at the destination, for a

ride type that the one or more drivers has enabled. The ride request demand may be evaluated in terms of the number of ride requests within a predetermined radius during a predetermined time period. For instance, the ride request demand may be the number of incoming booking requests within a 1 km radius over the last five minutes. The ride request demand may be higher during peak periods and lower during off-peak periods. The ride request demand may be higher during wet weather. The ride request demand may also be higher at locations with a larger crowd, for instance at commercial districts.

In some embodiments, the notification comprising the job request has been broadcasted to one or more drivers that have the request ride type enabled, prior to broadcasting the notification to one or more drivers that have the request ride type disabled. For instance, a job request for a personal-hire vehicle may have been broadcasted to a driver that has the option for accepting personal-hire vehicles enabled. The recipient of the broadcast may not have accepted the job within a predetermined time, for instance three minutes, necessitating a subsequent broadcast of the notification to the one or more drivers that have the request ride type disabled.

Advantageously, broadcasting a job request to a driver that has the request ride type disabled may also serve to create awareness on alternative ride types available to drivers. A driver may not have enabled a particular ride type, due to a misconception that the said ride type generally leads to lower fares than the ride type that the driver has enabled. By surfacing these ride requests to more drivers regardless of the ride types that may have been enabled, the driver who has had the ride allocated may benefit from higher net earnings for the day, and concurrently, the ride requester is allocated a driver in a shorter time.

Auto acceptance of requests and "no penalty" alerts

In some embodiments, drivers have "auto-accept" enabled. This means that incoming job requests, of a ride type that the driver has enabled and the origin of which is near the driver, can be automatically accepted on behalf of the driver. When advertising job requests to drivers who have had the request ride type

enabled, said drivers may have previously activated an option to automatically accept an incoming job request, when the incoming job request fulfils both their preferred ride type as well as being of an origin located within a predefined radius or travel time from where the driver is, at the instant the job request is made. If a said driver has opted to automatically accept an incoming job request, subsequent cancellation or delays in pick-up may lead to a penalty for the driver. The penalty may include fewer job requests of a similar nature, or it may include decreased eligibility for incentives received by the driver.

In a preferred embodiment, when broadcasting a notification to one or more drivers that have the request disabled, the notification further comprises broadcasting a "no penalty" alert. Advantageously, to incentivise a driver to complete a job request of a disabled ride type, a driver will be required to accept the job request manually, with no penalties incurred should the driver choose not to accept the job request. This overrides a driver's selection on whether or not incoming job requests are automatically accepted. Since the job request corresponds to a ride type which a driver has disabled, the jobs are not automatically accepted and a driver is allowed autonomy over the acceptance decision, with no penalties incurred.

In some embodiments, when a notification comprising a ride request has been broadcasted to one or more drivers in a corresponding one or more vehicles that have the request ride type disabled, the notification further comprises broadcasting the one or more ride parameters of the request ride type which is higher than a corresponding one or more ride parameters of a further ride type that the one or more drivers may have enabled.

This may be broadcasted as a highlight on the bonus fare value, if the said ride parameter is a generated ride fare, corresponding to a driver's potential earnings. The notification may be presented in a manner which draws the driver's attention to a higher ride fare for the request ride type. The higher ride fare may be expressed as a percentage of the base fare value. The higher ride fare may be of a fixed predetermined value (e.g. SGD2), or it may be set to increase progressively as the time elapsed since the ride request increases.

This may also be broadcasted as an alert indicating that "rides at the destination are in high demand" or similar, if the said ride parameter is a demand at the ride destination. Such an alert may incentivise the driver to accept the broadcasted ride request, as accepting the present job and heading to the ride destination may correspond to a driver's increased opportunities of converting another request to a booking upon completion of the present booking at the ride destination.

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 spirit and scope of the appended claims.

Throughout this disclosure, 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.

The reference to any prior art in this disclosure is not, and should not be taken as, an acknowledgement or any form of suggestion that the prior art forms part of the common general knowledge.

CLAIMS

1. A system for performing ride allocation, comprising:
 - a receiver module which receives a ride request, wherein the ride request comprises an origin and a destination;
 - a processor which generates and outputs, for each ride type of a plurality of ride types, one or more ride parameters;
 - a request module which receives a selection of a request ride type, the request ride type being a ride type from the plurality of ride types, and generates a job request corresponding to the selection;
 - an evaluation module which compares the one or more ride parameters of the request ride type to a corresponding one or more ride parameters of a further ride type, the further ride type being a ride type from the plurality of ride types which is not the request ride type; and if the one or more ride parameters of the request ride type is higher than a corresponding one or more ride parameters of a further ride type, generates a notification comprising the ride request, and broadcasts the notification to one or more drivers in a corresponding one or more vehicles that are eligible to accept the request ride type and have the request ride type disabled; and
 - an allocation module which allocates a job corresponding to the job request to a driver, upon receipt of acceptance of the job request by the driver of a said vehicle.
2. The system for performing ride allocation according to 1, wherein the one or more drivers are located within a predetermined distance or travel time of the origin.
3. The system for performing ride allocation according to 1 or 2, wherein, for each of the one or more drivers, the system determines eligibility in respect of each ride type.
4. The system for performing ride allocation according to any one of 1 to 3, wherein the one or more ride parameters comprises a ride fare pricing for the ride request.

5. The system for performing ride allocation according to any one of 1 to 4, wherein the one or more ride parameters comprises a demand at the origin and a demand at the destination, for a ride type that the one or more drivers has enabled, wherein the demand at the destination exceeds the demand at the origin.
6. The system for performing ride allocation according to 4, wherein the ride fare pricing is expressed as a sum of a base fare value and a bonus fare value.
7. The system for performing ride allocation according to 6, wherein the bonus fare value is generated based on the demand at the origin and/or the demand at the destination.
8. The system for performing ride allocation according to any one of 1 to 7, wherein prior to broadcasting the notification, the job request is advertised to one or more drivers that have the request ride type enabled.
9. The system for performing ride allocation according to any one of 1 to 8, wherein receipt of acceptance of the job request by the driver of a said vehicle comprises an active intervention by the driver to accept the job.
10. The system for performing ride allocation according to any one of 1 to 9, wherein broadcasting the notification further comprises broadcasting a "no penalty" alert.
11. The system for performing ride allocation according to any one of 1 to 10, wherein broadcasting the notification further comprises broadcasting the one or more ride parameters of the request ride type which is higher than a corresponding one or more ride parameters of a ride type, from the plurality of ride types, that the one or more drivers has enabled.
12. A method for performing ride allocation, comprising:
 - receiving a ride request, wherein the ride request comprises an origin and a destination;

generating and presenting an output, for each ride type of a plurality of ride types, one or more ride parameters;
 receiving a selection of a request ride type, the request ride type being a ride type from the plurality of ride types, and generating a job request corresponding to the selection;
 comparing the one or more ride parameters of the request ride type to a corresponding one or more ride parameters of a further ride type, the further ride type being a ride type from the plurality of ride types which is not the request ride type; and if the one or more ride parameters of the request ride type is higher than a corresponding one or more ride parameters of a further ride type, generating a notification comprising the ride request, and broadcasting the notification to one or more drivers in a corresponding one or more vehicles that are eligible to accept the request ride type and have the request ride type disabled; and
 allocating the job corresponding to the job request to a driver, upon receipt of acceptance of the job request by the driver of a said vehicle.

13. The method for performing ride allocation according to 12, wherein the one or more drivers are located within a predetermined distance or travel time of the origin.
14. The method for performing ride allocation according to 12 or 13, wherein the one or more ride parameters comprises a ride fare pricing, wherein the ride fare pricing is expressed as a sum of a base fare value and a bonus fare value.
15. The method for performing ride allocation according to 12 or 13, wherein the one or more ride parameters comprises a demand at the origin and a demand at the destination, for a ride type that the one or more drivers has enabled, wherein the demand at the destination exceeds the demand at the origin.

16. The method for performing ride allocation according to any one of 12 to 15, wherein prior to broadcasting the notification, the job request is advertised to one or more drivers that have the request ride type enabled.
17. The method for performing ride allocation according to any one of 12 to 16, wherein prior to broadcasting the notification, the job request is advertised to one or more drivers that have the request ride type enabled.
18. The method for performing ride allocation according to any one of 12 to 17, wherein receipt of acceptance of the job request by the driver of a said vehicle comprises an active intervention by the driver to accept the job.
19. The method for performing ride allocation according to any one of 12 to 18, wherein broadcasting the notification further comprises broadcasting a "no penalty" alert.
20. The method for performing ride allocation according to any one of 12 to 19, wherein broadcasting the notification further comprises broadcasting the one or more ride parameters of the request ride type which is higher than a corresponding one or more ride parameters of a ride type, from the plurality of ride types, that the one or more drivers has enabled.