

The Ethical Dilemma for Ele.Me: Balance Between Working Safety and Profit

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ABSTRACT

O2O businesses have undergone great advancements in the past few years in China. As one of the most renowned food ordering and delivery service applications, Ele.Me is commonly deemed as a successful case. However, despite its great financial achievement, Ele.Me has also been critiqued for its unethical behavior with respect to its delivery drivers. Furthermore, some critical work-safety issues comprising the long working hours, poor working conditions, and risks of transportation accidents have been heatedly discussed, which negatively impact its company image and public trust. In this case, this study probes this issue by mathematical modelling and analyzing in line with ethics theories. As a result, two solutions concerning algorithm modifications and facility construction are proposed to mitigate the challenges mentioned above. Thus, this study would make contributions to those ethical issues existing in Chinese fiercely competing O2O sectors.

Keywords: *O2O, Human Resources Management; Work safety, Ethics, Efficiency, Ele.Me*

1. INTRODUCTION

Ele.Me is a Chinese O2O (online-to-offline) service platform for locally found consumer products and retail services, including entertainment, dining, delivery, travel, and other services. The company has 600 million users and almost 4.5 million business partners covering nearly all of China [1]. About 35 million people use the service every day.

One of the most important components for the operation process of Ele.Me is their delivery services conducted by delivery drivers [2]. Delivery drivers are the bridge between restaurants and customers. After the customers make their orders through the Ele.Me platform and the restaurants complete their orders, that food would be given to the delivery drivers who are in the area [3]. The delivery drivers will then deliver food to their customers, using scooters, a motorcycle-looking vehicle that uses electricity instead of gasoline, to complete the tasks.

The delivery drivers have a high chance of getting involved in traffic accidents. One of the major reasons is their use of scooters. One of the biggest advantages of driving a scooter is that it has the speed of a motorcycle, yet it does not have to follow strict traffic rules that apply to cars. With the scooter, delivery drivers can complete their orders as quickly as possible. To complete the most orders and avoid penalties on late deliveries, there is an increasing risk for Ele.Me delivery drivers to break traffic rules and get involved in traffic accidents, damaging the safety and health of Ele.Me delivery drivers. So why do the delivery drivers want their orders to be completed as soon as possible despite the risks of being injured in traffic accidents? The problematic delivery reward system of Ele.me has a lot to do with this phenomenon.

For delivery drivers, the average of their salary is calculated as below: 3.5-4.5rmb per order delivered. With 300-600 orders in one month, a regular delivery driver will make 2500 RMB or more. This can be concluded as: the more orders delivered, the more money they make. With Ele.Me. shrinking the delivery time of each order,

they would want their delivery drivers to deliver as much as possible. Thus, rationalizing the exploitation of their employees by making the delivery drivers believe they have the same motivation as the company: the more deliveries, the better [4].

On Sep 9, 2020, Ele.Me announced a new function of their delivery app called "Would you like to give me 5 more minutes?" The "You" in this slogan is Ele. Me's customers, the "Me" stands for Ele. Me's delivery drivers. Basically, this function asks the customers if they would be willing to give more delivery time to the drivers if they are not in a hurry. However, this behavior was considered as a shift of responsibility of the company to their customers. This indirectly says that "if the delivery drivers got involved in traffic accidents, it is the customers' fault that they did not want them to slow down." If we think of Ele.Me's action in a rational way, they are morally kidnapping their customers.

Thereby, this study attempts to further dig into this critical topic with respect to the profitability of Ele.Me and pertinent ethical and driver safety issues. In the following sections, a model has been first constructed

2. EVALUATION

2.1 Modelling

2.1.1 The factor considered in the model

The model focuses on the evaluation of how humane the delivery system is on the platform of Ele.Me takeout. The quantitative analysis will all be based on the data collected from the official platform of Ele.Me. The main factor considered is working safety.

2.1.2 Modelling Method

The research methods are mainly limited in the quasi-experimental research based on the raw data collected online. The comparison will be judged by the common rubrics published by several official websites, including WHO and CDC.

More specifically, for working safety, the relationship between the distance the delivery man needs to travel and the time limit will be collected by ordering meals from different distances online at a specific time period to avoid random errors and special situations. Then, the relationship between the speed and the possibility of scooter accidents will be deduced based on the data collected at the national transportation center. Finally, the evaluation of the working safety will be carried out by combining the two criteria.

2.1.3 Model presenting

The model is simulated using the curve fit regression. Possibility of scooter accidents that will cause relatively harsh injuries (>level 2)

$$P(v) = \frac{e^{bv+c}}{a}, \text{ where } a = 0.47, b = 0.0602, c = -1.07 \quad (1)$$

$P(v)$ represents the percent of the possibility of the occurrence of a scooter accident that is relatively serious, while v represents the speed of the scooter in km/h. For example, a certain scooter was traveling at a speed of 32km/h, then the possibility of an accident is:

$$P(32) = \frac{e^{0.0602 \times 32 - 1.07}}{0.47} = 5.3 \quad (2)$$

This means that there is a 5.3% possibility of having an accident at this speed. Figure 1 can be a better representation of the model. It is apparent that as speed goes up, the risk goes up.

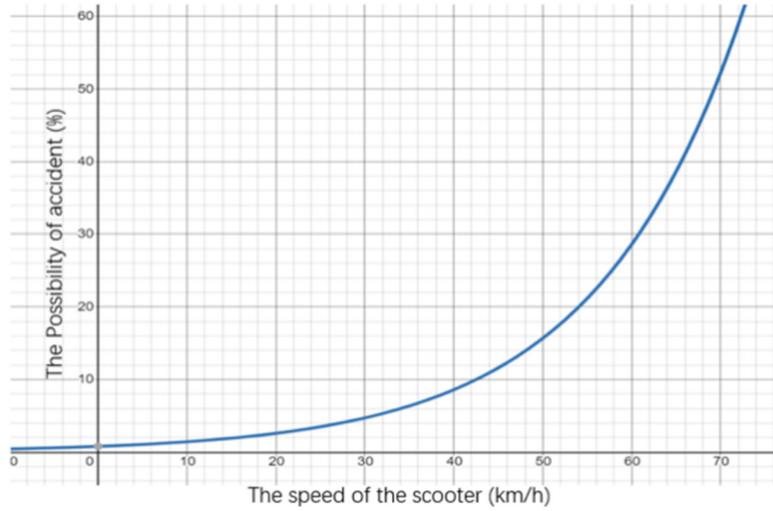


Figure 1. Correlation between the speed of the scooter and the possibility of an accident

After the first simulation, the next model (Figure 2) of the average time of the delivery is created. Just as the preceding model, the logistic regression model is used to deduce the relationship between the distance and the time limit, where T represents the time limit set by the platform and d represents the distance from the store to the customer.

$$T(d) = \frac{1}{a + e^{b \cdot d + c}} + k, \text{ where } a = 0.018, b = -0.79, c = 0.19, k = 16 \quad (3)$$



Figure 2. Correlation between the distance between the store and the customer and the time limit for the riders

Finally, to combine the two models, we could find the derivative of the second model to deduce the relationship between the distance and the speed required. It is noticed that the time the rider needs to go to the store also requires to be added to consideration, which is about 2km around

the store. Therefore, it could be deduced that the average speed required is 17km/h, with the lowest point at 1km of 13km/h and a loc minimum at 6km of 17km/h. The possibility of accidents at different distances is then deduced in Figure 3.

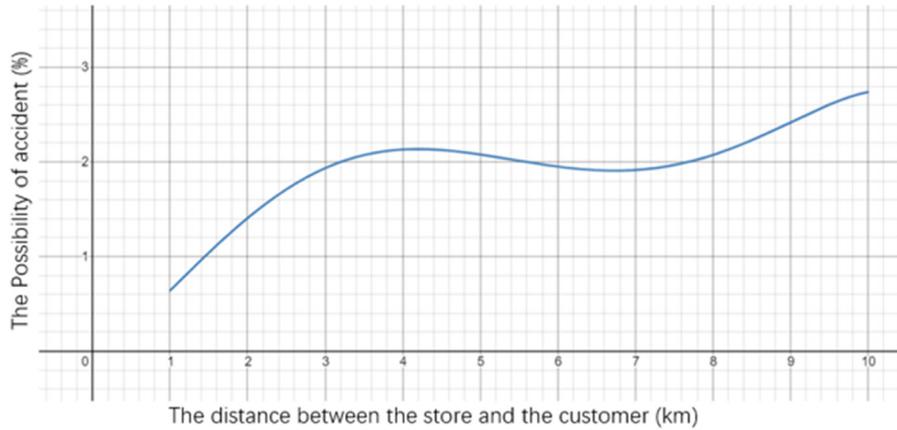


Figure 3. Correlation between the distance between the store and the customer and the time limit for the riders

The y-axis represents the possibility of accidents, and the x-axis represents the distance to the store's customer. Thus, when ordering food from a close distance, it is better to order as close as possible, and when ordering food from a further distance, it may be better to order food from 6km to 7km to ensure a relatively low risk.

2.1.4 Final score

To present a final score for the situation existing in Ele.Me, for each distance, a score can be given. Finally,

a result based on the frequency of a certain distance of delivery is reached. Based on the data collected, the possibility of the distance of the order follows the following rules:

$$G(x) = \frac{k}{\sqrt{2\pi} \cdot \sigma} \cdot \exp\left(-\frac{(x - \mu)^2}{2\epsilon^2}\right) + m^{-x} + c$$

Where $k = 1.02, \sigma = -0.713, \mu = -2.58, m = 1.013, c = -0.83, \epsilon = 1.668$

(4)

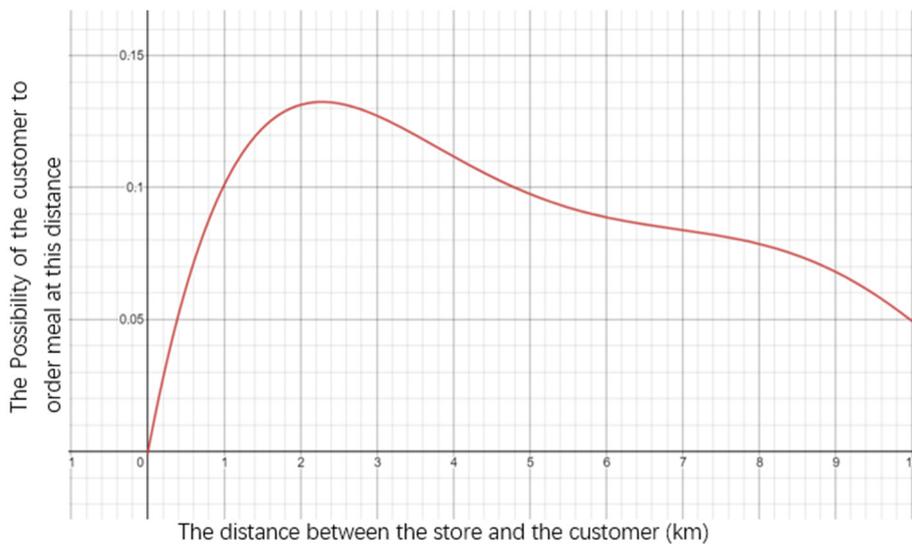


Figure 4. Skewness distribution of the possibility of different distances when people order food

Figure 4 represents a skewness distribution of the possibility of different distances when people order food, this can be used when calculating a final score. The final score would then be:

$$E(x) = \int_0^{10} \left(\frac{k}{\sqrt{2\pi} \cdot \sigma} \cdot \exp\left(-\frac{(x - \mu)^2}{2\epsilon^2}\right) + m^{-x} + cdx \right) \cdot K = 63.1$$

(5)

Where K is an adjusting index out of 100, and E(x) represents a final score of the situation of the platform of Ele.Me.

As a result of the modelling analysis, it can be found that as the distance increases, the possibility of accidents increases significantly. Thus, in the algorithm design of Ele.Me, the factors, including the distance, time limit, should be comprehensively taken into account.

2.2 Evaluation from the perspective of the general public

We further look at this issue from the perspective of the general public. People often follow their own moral bottom line and judge what happens according to their own moral standards. From the perspective of Deontology, people tend to focus on behavior standards when judging an action without considering the consequences [5]. Therefore, analyzing the real-time comments on the entire issue, we found that people added and condemned Ele. Me's moral responsibility through the safety issues of the delivery drivers and the frequency of accidents. At the same time, through the exposure of reporters and public opinion, it can be found that Ele.Me has connected restaurants, delivery staff, and customers through a system. According to the delivery drivers, the system has the problem of poor navigation ability. The system can help delivery drivers plan delivery orders and routes. But this is only limited to calculating the straight-line distance and ignores the time of the delivery drivers waiting for traffic lights, picking up meals, etc. Therefore, the delivery drivers need to sacrifice their own safety to make up for the jet lag [4].

Immediately afterward, an article was published and found that the evaluation rules of the Ele.Me system for delivery drivers was unreasonable [5]. First of all, there is a gamified checkpoint system in the system. Delivery drivers need to be rewarded by getting high scores from customers to get a higher level. Through the system interface, it can be understood that high scores are often obtained from three aspects: whether they are on time, whether they are polite, and whether customers are satisfied with the meal. After forming such a competition mechanism, many delivery drivers were forced to enter an unstoppable cycle. The higher the level, the greater the pressure. This undoubtedly increases the psychological pressure of the delivery drivers.

Another article published a dispute between the delivery driver and the restaurant staff. This situation often reveals how impetuous the delivery drivers are in high-pressure and high-risk situations, with Ele.Me's system is constantly shrinking the delivery time, and the restaurant does not have any regulations on the time it takes to complete the order. As a result, the delivery drivers wasted a lot of time waiting for the restaurant to complete the order. After a long wait, the delivery drivers have to bear the fine for being late.

Through these real-time responses, in the relevant transaction chain of the four stakeholders: customers, restaurants, delivery drivers, and Ele.me Company, delivery drivers are the most oppressed group in the entire transaction application chain. Furthermore, after the news media reported on this group, people judged the Ele.me system and the company's unfair exploitation of delivery drivers based on their own ethical standards.

Ele.me announced a new function with the slogan "Will you give me another 5 minutes?" in September 2020. As soon as this feature appeared, it caused great controversy. CCTV News Weibo launched a survey on the usefulness of the 5-minute function of the takeaway platform setting and found that 75% of netizens think the function is useless. And this function is considered by the public to transfer the initiator of exploitation to the customer group, thereby kidnapping customers morally. Still, this function does not affect any operation of Ele.me. So, when people criticized the incident from a moral point of view, Ele.me used this to kidnap customers morally to achieve the purpose of exploiting the delivery drivers to obtain high profits. Unlimited targeted problem-solving methods cannot truly solve the troubled delivery drivers morally. What really needs to be improved is not the customer's requirements for delivery drivers but the humanized rectification of the system algorithm by Ele.me and the reasonable planning of the delivery method and location.

Now, we continue to explore this problem from the perspective of Consequentialism. The simplest interpretation of Consequentialism is that it advocates that behavior is determined by the maximum valid value of the last result [7, 8]. We start from the main stakeholders of the case of Ele.Me. The results anticipated by different stakeholders are different, and the impacts generated between stakeholders are also one of the factors that affect problems.

First of all, Ele.Me establishes a platform and system for customers and merchants and provides the job of delivery drivers to connect the merchant and customers. The role of Ele.Me is the key to the bridge between customers and merchants, while delivery drivers are also a key to Ele.Me to make money. According to the understanding of how Ele.Me obtains benefits; it is mainly divided into three parts.

The first part is regarding obtaining advertising costs, franchise fees, and proxy fees from the merchant or Food sellers. Merchants need to use the App to reach customers by paying for the system. If the merchant wants to have more customers, it needs to invest more advertising fees. This also means that the more money required to join the system, the more earned by Ele.Me, even though the company only needs to provide a system that can accommodate as much as possible. From the issue, Ele.Me has ignored the security risks of delivery drivers and its use of the concept of stealing to give the responsibility. These have got a lot of controversies in society. These comments and events have destroyed a part of the company's image, which will cause the company's products to reduce the customer's persuasion. But looking at the whole logistics market, Ele.Me's core competitiveness is still at the top of the market [8]. A large number of customers will still use this system to order while maintaining the rights and interests of delivery

drivers on the network. Merchant will also tend to join the system to get as many customers as possible. Therefore, the benefits obtained by Ele.me at the merchant's premises will not show a downward trend.

Second, Ele.Me would extract part of the cost from each order of delivery drivers. This is also the initial reason why delivery drivers gradually ignore their safety and try to take more orders. Not only do delivery drivers get more income, Ele.Me is the biggest gainer in the competition among delivery drivers. The more delivery drivers take orders, the more profit Ele.Me makes. The company continuously shortens the estimated speed of distribution through algorithms so that delivery drivers have to accelerate and ignore their safety risks. In July 2021, due to the continuous exposure of the network to the safety risks of delivery drivers, Ele.Me began to advocate establishing a "safety ecosystem" in the logistics service market to reduce the safety risks of delivery drivers by purchasing commercial insurance and arranging safety training for delivery drivers. However, Ele.me has not rectified the inhumanity of the algorithm in its own system, and the formalism is greater than the substance. To the public, the position of establishing a "safety ecosystem" is only to restore the corporate image [9]. However, it still does not prevent them from skillfully exploiting delivery drivers in terms of the system. As a result, delivery drivers still bear great safety risks.

Third, customers can register and use the system for orders free, but each order is paid to the delivery driver, the merchant, and Ele.Me. The biggest impact on Ele.Me is the customer. The customer judges the event through his own moral standards. At the same time, social news and articles constantly ask people for sympathy. This leads customers to choose Ele. Me's competitors in this industry because of the concerns of delivery drivers and their control over their moral bottom line. The loss of customers will directly affect the choice of merchants and delivery drivers. Merchants will choose companies with more concentrated customers for investment. Delivery drivers will choose to work for competitive companies because of more reasonable benefits and more customers from competitors. This is also the reason why Ele.Me chose to verbally establish a "safe ecosystem" to maintain the stability of three important stakeholders. The stability of customers can bring stable profits. As for the safety risk of delivery drivers, we still doubt whether Ele.Me will change the algorithm to really consider the safety of delivery drivers before setting off the next greater public opinion.

3. RECOMMENDATIONS

3.1 Solution 1

The objective of solution 1 is to remove the public's moral condemnation of Ele.Me, which can be achieved by increasing the delivery time limit per order by 8-10 minutes while increasing the flexibility of choice for delivery drivers.

In September 2020, Ele.Me requested customers to "give 5 minutes more to the delivery drivers", but the customers rejected it, saying Ele.Me was shirking its responsibility. Meanwhile, MeiTuan proposed a new policy of giving 8 minutes extra delivery time to each delivery order, which customers welcomed. This shows that it is necessary for Ele.Me to increase the delivery time of each order.

As shown from Figure 1 above in the analysis section, the closer the distance between merchants and customers is, the shorter the delivery time automatically set by the platform will be. Nevertheless, there are two things that have not been taken into consideration: 1) it takes time for merchants to get food ready, especially at lunch or dinner time, and 2) the complex terrain of the customer's neighborhood or office building takes time to find.

As shown from Figure 4 above, when the distance between customers and merchants is about 2.2km, the accident frequency of food delivery drivers is relatively stable and low. If Ele.Me can control the distance of most orders at about 2.2km, which will greatly reduce the frequency of safety risks of delivery drivers. When the order distance is controlled at about 2.2km and the delivery time increases, the delivery driver will no longer trade life safety for speed.

At the same time, their demand for scooters is no longer necessary, so Ele.Me can also provide a more flexible choice of vehicles for delivery drivers. Figure 5 below shows the 4 different types of delivery drivers from GrabFood, a southeast Asian food delivery company. Ele.me could learn from GrabFood [10], which determines the driver's delivery tool by distance.

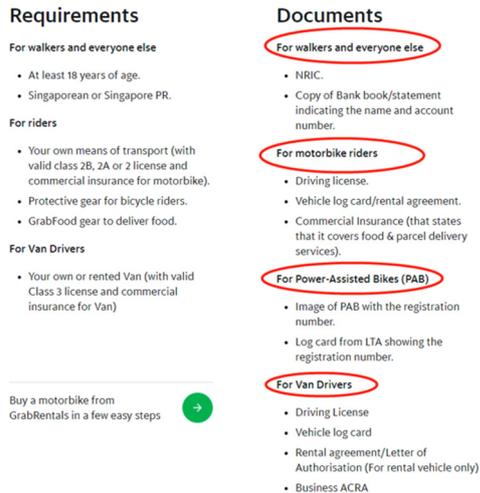


Figure 5. Alternatives for delivery vehicles

Some benefits can be witnessed as a result of this approach. First, according to the mathematical model, reducing the speed of the car can also reduce the probability of an accident. Second, drivers can choose their own vehicle and control the speed between 4 and 25km/h to better ensure their safety. As for the second benefit, while guaranteeing the safety of contracted drivers, it also ensures that those large number of part-time drivers does not damage its own benefits.

With regard to the costs, Ele.Me may suffer a loss in the initial phase of the new delivery mode for fewer drivers buying an electric vehicle from the company. In practice, service delivery companies make more money from riders delivering as many orders as possible and charging merchants as much as possible on the platform. Therefore, implementing this scheme may lead to the need to add commissions and advertising recommendation fees for merchants as the platform spends more on drivers, Ele.Me need to recoup that spending on the merchant.

3.2 Solution 2

The second solution is that Ele.Me could build dining cabinets at the populated area such as hospital, office building, university. The dining cabinet has a heat preservation and sterilizing function. It is a good choice for busy workers and students who can avoid the endless calls from the delivery drivers. They can pick their food from the dining cabinet when they have free time, and they will not need to worry about their food getting cold. Last but not least, this will fully accomplish "zero contact delivery".

In line with the SWOT analysis framework, the following parts are separated into four parts. The strength of building a dining cabinet for Ele.Me are multifold. Furthermore, the dining cabinet would make delivery drivers' delivery in the last kilometer more convenient, especially for those 'hot time', the courier will save a lot

of time from waiting for the elevator, finding each specific room, and waiting for customers to pick up. This will also ensure our delivery driver's safety, we will use the Voronoi diagram to calculate the site of dining cabinets inside the range of 6.7km, so as the Voronoi diagram has shown, the maximum delivery distance is 6.7km.

The great opportunity for Ele.Me is that Dining cabinet is existing technology, Ele.Me can find OEM to buy the product. This would save the R&D costs. However, Ele.me still need to pay extra costs on buying the dining cabinet. Moreover, the competitor, Meituan, promotes dining cabinets, so the weaknesses are shown in the negotiation with a populated place to build Eleme's dining cabinet instead of Meituan.

Whereas, building a dining cabinet can bring a lot of opportunities for Eleme, such as getting subsidies from the government since the Chinese government is now promoting "zero contact delivering", this would boost the usage of the dining cabinet. And more importantly, this is a good opportunity to build a strong brand image, which Eleme is carrying both delivery driver and the costumer's safety issue. Hopefully, it will throw away the name of an unethical company. The dining cabinet will also bring extra profits from advertisements placed on the dining cabinet to stand out. The time saved in the last kilometer would enlarger the delivery time on the road, delivery drivers could avoid antidromic riding, speeding, and other violation of traffic rules.

However, it is undeniable that there are also threats underneath. According to the customers' recent feedback, some of them are annoying with walking downstairs to pick up their food. But luckily, it is still a small proportion of users. But I think the real threat will appear after the pandemic is over. After that, the necessity of zero contact delivery will largely decrease. Finally, since delivery drivers benefit from the dining cabinet and good Shanghai feedback, we think Ele.Me should start to build the dining cabinet in other cities around China.

4. CONCLUSION

In conclusion, even though Ele.Me is a pretty successful O2O service platform in China. There are still problems when it comes to business ethics for the management and work-life balance for their delivery drivers, by taking a closer look at the interviews and news articles of some of Ele. Me's workers, we can conclude that Ele.Me is exploiting delivery drivers by shrinking their delivery time, creating a problematic reward system, and shifting responsibilities to their customers. According to the data we have gathered and the math models being created, there are two possible solutions to help ensure the safety of Ele.Me delivery drivers. One solution is to permit more delivery time and more flexibility for delivery drivers, the other being setting dining cabinets in office buildings, schools, and neighborhoods to reduce

delivery drivers' workload. There are also risks of performing these two solutions in real-life situations. There can be a great amount of expenditure on choices over different delivering vehicles and setting cabinets with temperature controls and smart locks. The outcomes of these possible changes still remain uncertain. Therefore, future studies for this particular topic could provide a focus on how Ele.Me can still generate the same or more revenue by applying the two solutions. With the delivery service industry expanding so rapidly, merchants are gaining more orders, and customers are getting better services. At the same time, delivery service firms like Ele.Me would also want the delivery drivers to be safe and happy in a healthy working environment.

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