

Digitalized Platform to Better Utilize Empty Space of Return Runs of Truck

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I. INTRODUCTION

Sri Lanka depends heavily on road for freight transportation where around 97% of domestic freight is transported by roads using trucks [1]. It was further related that half of the above trucks returning empty [1]. Such empty truck return runs go unnoticed in Sri Lanka. In other developed countries, digitalization such as digital tracking and tracing is used to minimize empty return runs of trucks by making them noticed by the parties in the supply chain. No such digital tracking and tracing is available in Sri Lanka to provide real time information on the truck operations. Therefore, the empty return runs remain unnoticed. Because of its being unnoticed, these empty space in the return runs of trucks are not used optimally. Lack of optimal use of these available space in the return runs of trucks incurs high cost of operation and lowers the net profit of truck operators. High cost and lower profit to truck operators leads to increase in charging high transportation cost from the shippers (local farmers). High transportation cost affects all the parties in the supply chain including the customers, suppliers, transport operators and the country. Therefore, the objective of this study is to propose a digitalization approach of tracking and tracing the trucks that could give real time information on truck operations in Sri Lanka. This digitalization approach can help suppliers, transport operators and regulators to better utilize the empty space available in the return runs of trucks. This approach would pave the way for better customer satisfaction as it could reduce the freight transport costs.

II. LITERATURE REVIEW

Live information sharing models generated many business opportunities in today's world [2]. Models such as "uber" was one of the leading live information shared models existing in the world and users had positive comments and feedback towards the service offered. Uber provided multiple options for users to transit from one location to another. Estimated cost of traveling, duration of the trip and number of kilometers to travel were some of the information shared through the live information system [3]. Tracking vehicles using an installed GPS device inside the vehicle and mapping the live location via the use of internet was identified as one of the easiest and inexpensive methods. The importance of connecting GPS with Android enabled smart phones for the convenience of

users was identified [4]. Use of GPS data to improve transport solutions for domestic shippers was discussed as a strategic step taken by transporting companies to decide when and where they had to engage in other transport assignments to improve the load factors on their trucks [5]. GPS based fleet management system technology provided synergy to transport companies and achieved many management goals such as monitoring and tracking commodity distribution, energy saving, safety, and quality [6]. Nowadays, finance and technology are combined with the use of the internet triggered digital payment technologies and such technological innovation in the payment industry is the foundation for financial inclusion to transform from traditional payments methods to digital paying methods in the modern-day digital environment.

III. MATERIALS AND METHODS

The transport operators who are willing to utilize the empty space of return runs of trucks were also agreed on sharing real time information on space and location through a digitalized approach at the time of discussion. The discussions were organized with the truck operators and the benefits of sharing live information on return runs were elaborated. The methods of sharing live information based on calculations on available space and live locations of the trucks were investigated. The feasibility of attracting the shipments on their return runs was investigated. Computer programmers were contacted to design an algorithm on behalf of uber to estimate the empty space available in the trucks upon getting shipment entries from the shippers as the return run progresses. Informal discussion with the shippers on the feasibility of using a digitalized platform for their daily transportation operations was conducted. Either paying cash at shipper's location or submitting credit card or debit card details as existing for other uber services such as "uber eats" were discussed as acceptable methods of payments.

IV. RESULTS AND DISCUSSION

The first step of this overall project would be creating two interface/portals/apps as one for the transport operator and another for the shipper same as in the taxi operation for driver and passenger. Secondly, to register fleet of vehicles/trucks own by transport operator's using transport operator's interface/portal/app. A smart phone enabled with GPS and downloaded app should be equipped in each truck/vehicle. Users would be able to enter the current

location of the shipment to be picked up, dimensions of the shipment (length, width, and height in centimeters), estimated weight of the shipment, destination of the shipment, contact details of the shipper and contact details of the consignee using the shipper's app. Shipper would have a place to upload the photo of the shipment too. In addition, several categories of trucks would also consist which could be desired by the shippers.

Computer algorithm would be required to calculate the available empty space in the trucks. For that, the details on the truck capacity should be pre-entered at the time of registering the truck/vehicle using transport operator's app. Based on the entries from the shippers using shipper's app, the available empty space would be thus calculated by subtracting the volume of the shipments received from the volume of the truck for loading. Based on the available empty space in the truck for cargo loading, invoice would be generated and sent to the respective shipper. This invoice would consist of the details on the shipment and the charges. The payment portal would be available for the users to make their payments. Once payment is made, the shipper would get a phone call from the conductor of the nearby truck for further verification. Therefore, this approach helps empty space of the return runs of truck being well utilized.

However, collecting cargo from all the shippers would become a challenge for the truck operators due to the locations of shippers. Therefore, it was suggested that cargo centers could be pre-determined for each route to load and unload cargo to save time. To increase the efficiency of service, cargo centers might be helpful to avoid travelling to byroads to collect shipments and deliver shipments. Service can be operated giving full focus to run on the main roads to increase the efficiency.

V. CONCLUSION

As discussed in the above sections, the concept of providing digitalized platform to provide real time information on the empty spaces will help better utilization of the empty spaces of the return runs of trucks in Sri Lanka. This concept will be beneficial for both transport operators and local shippers to fulfil their requirements. The shippers would be able to transport their shipments at a lower cost whereas the truck operators would get additional income as their empty spaces in their return runs were to be utilized. Cost of transportation in return journeys is a topic which was never addressed in Sri Lanka previously. Therefore, to make trucking industry more cost effective, the available empty space of trucks in return trip can use as an opportunity for domestic shippers who are willing to send goods to Colombo. This attempt to use empty space available in trucks in the return trip would be therefore a win – win situation for both domestic shippers and transport operators.

The main limitation of this study is that this concept does not propose any mechanism to crosscheck the accuracy of the

information on volume of the shipment provided by the shippers. Such inaccurate information could disturb the efficient utilization of the empty space in return runs of the trucks. Future research can recommend any technological component to get the real time data on the volume of the shipment.

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