

Statistical Analysis of the Drying Process at a Car Wash

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Abstract

One of the competitive advantages of going to an automated car wash is that in less than ten minutes we have the car clean. At least on the outside. However, in these automatic car wash centers it is not guaranteed that your car will come out completely dry. In this research, the washing and drying process of cars in a car wash in the Carolina area of Puerto Rico was explored. The amount of water contained in the car after leaving the drying area and the drying time was evaluated. Two categories were created for comparison purposes. These were compact cars and SUVs. The sample size was $n = 60$ stratified in $n = 30$ cars and $n = 30$ SUV. To investigate the problem, the six sigma DMAIC methodology and the 5S tool from Lean Manufacturing was used. The first step was to understand the voice of customer (VOC) about their satisfaction with the drying process. The results showed that 50% of customers visit the car wash at least once a month, 29% of the cars / SUVs observed were Toyota brand followed by 11.3% Honda, and 37% of customers expressed not being satisfied with the drying. Employees were asked if they considered drying adequate 50% indicated they didn't.

The process starts when the client arrives in the area and pays for the service. Then the client drives to the lane of washing. At the entrance of the car wash tunnel the car/SUV goes through a curtain of water and then soap is applied. Go through the washing mitts and then go through a curtain of water. Finally, many blowers emit air to dry the car/SUV and the car/SUV leaves the tunnel. In this last stage the water measurements left in the car/SUV were collected. On average a car took in the drying station 0.7745 minutes with a standard deviation of 0.0.1566 minutes. In contrast, an SUV took 0.8806 minutes with a standard deviation of 0.1380 minutes. The average amount of water left in a car was 15.63 mL with a standard deviation of 9.27 mL. On the other hand, an SUV had an average of 14.85 mL with a standard deviation of 9.99 mL. Preliminarily it was identified that the evaluated cars had more water than the SUV. However, the range determined for cars was 33.27 mL and for SUV was 41.30 mL.

Both types of cars are left with water and the customer must proceed to dry it manually or simply leave it that way. Among them, the programming of the time of the machine, the type of drying agent that is used, the speed of the conveyor, the type of nozzle of the blowers of drying among other causes. The 5S was carried out in the storage area of the chemical products. It was identified that it was not organized and labeled. These causes will guide the improvements that must be made in the car wash system to ensure that the cars come out better dried.