

# Implement Lean Thinking in Automotive Service Centers to Improve Customers' Satisfaction

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**Abstract** – In industrialized countries, most of the companies deployed lean manufacturing techniques in order to minimize the wastes and consequently maximize the overall benefits. In the present work, the lean manufacturing techniques are applied in automotive service centers to measure the customers' satisfaction. Moreover, the impacts of such technique on the overall business environment are evaluated. Results indicate that both the leading time and takt time are significantly reduced by about 69.4%, and 52.0% respectively. In addition, the service center's layouts are improved. Accordingly, the closeness rate of the production department increases and the total distance travelled is reduced. The customer satisfaction index is improved by 74.1%. The obtained results encourage the industrial companies to use the lean thinking approach in services and production departments in order to greatly enhance the productivity, competitiveness and overcome the industrial obstacles.

**Keywords:** Automotive service center, Value stream map, Lean manufacturing, Customer satisfaction, continues improvement.

## 1. INTRODUCTION

The future of manufacturing in any industrial country depends on the ability to achieve dramatic improvements in productivity - output per employee - while continuously improving quality to meet rising customer expectations. In other words, survival in the competitive global economy requires successful implementation of continuous improvement techniques such as lean production systems. Many have claimed that "lean" is not a buzz word; nor is it only a cost reduction technique. In fact, proponents of "lean" often regard it as one of the most important strategies for business to achieve world class performance by doing more with less.

Lean manufacturing is the processes, techniques, strategies and initiatives being implemented by companies around the world that aim to reduce

unnecessary and unproductive tasks, activities and behaviors in the work environment. The market no longer accepts waste caused by out of control production/service or inefficient processes, and that what drive us to search for methods to reduce wastes/muda, "TIMWOOD" is the given mnemonic and it's classified a Transportation, Inventory, Motion, Waiting, Over production, Over processing and defects. I have been working in two different dealers' service centers in Kuwait, during that time we faced a lot of problems that affected our productivity, efficiency, resources, lead time, profitability and customers' satisfaction: such as workshop scheduling, unorganized parking space, job loading to technician and leveling to workshop, staff, creating appointment system, vehicle delivery to customers, vehicles' entrance to service center, reception area, training center and customer convenience.

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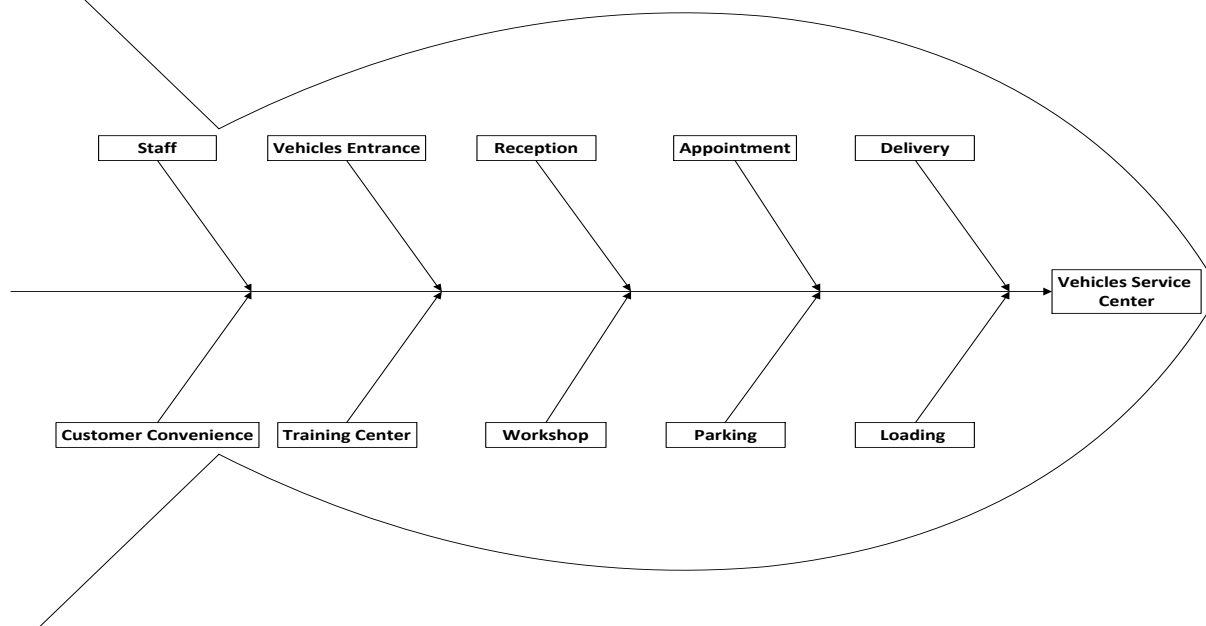
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**Figure.1:** Different kind of wastes found in service center, represented in "Cause and effect" diagram

## 2. LITREATURE

Lean manufacturing is a production system which was first developed by Toyota to reduce wastes while improving the operational and environmental performance of manufacturing and industrial businesses. This thesis describes practical strategies for using Lean manufacturing.

The Lean implementation methodology (Lean) has its roots particularly the automotive sector through Toyota Production System. Over the last decade, Lean has expanded beyond manufacturing to become an improvement methodology firstly in the service sector and more recently in public sector organizations looking to improve efficiency and customer value.

While the global industrial market suffers from gnarled competition, lean manufacturing philosophy is providing an effective methodology to reduce cost and maximize profit. The current global approach in business is to drive efficiency as means to maintain business rather than boast capacities. In the current economic situation, efficiency has worked its way up from being a sophisticated accessory to being a core business need.

Because Lean Manufacturing is a primary target for today's industry:

For survival competitiveness and excellence Lean production uses much less space, time and resources. It reduces errors and defects significantly and results in more customer satisfaction compared to traditional

mass production batch and lot production where

maintaining high quality standards would not be possible without a great workforce.

Lean training provides employees with an important mindset and culture. We set up every manufacturing cell with Lean in mind, that way we have the best possible cost matrix and value proposition for our customer and for our business.

## 3. PROBLEMS' STATEMENT

We will mention only two kinds of the most important ten wastes that impact directly in customers' satisfaction, and the lean thinking applied to eliminate them.

### 3.1 DELIVERY

Service advisors main job is to receive customers, listen to their concerns, requirements and complains, check their vehicles, create job cards with the required work, offer courtesy vehicle, follow up work progress inside workshop, gain customer approval in case of additional parts or labor, prepare the bill, call customer when vehicle is ready, make sure vehicle is washed and cleaned, explain the bill in details "labor, parts" and deliver vehicle to customer.

Customers return back to dealer service department to collect their vehicles after the job is done.

- Service advisor who receive the customer's vehicle left "his duty time is finished"
- Service advisor is busy with another customer
- Customers need to know what has been done in their vehicles, and what they pay money for.
- What is the warranty for the job that has been done,

when the next service, is there any concern customer should note in the future...etc., these all questions and more, customers are asking and will

always ask about it.  
 For all what mentioned before and more: New section in service department is established "delivery section".

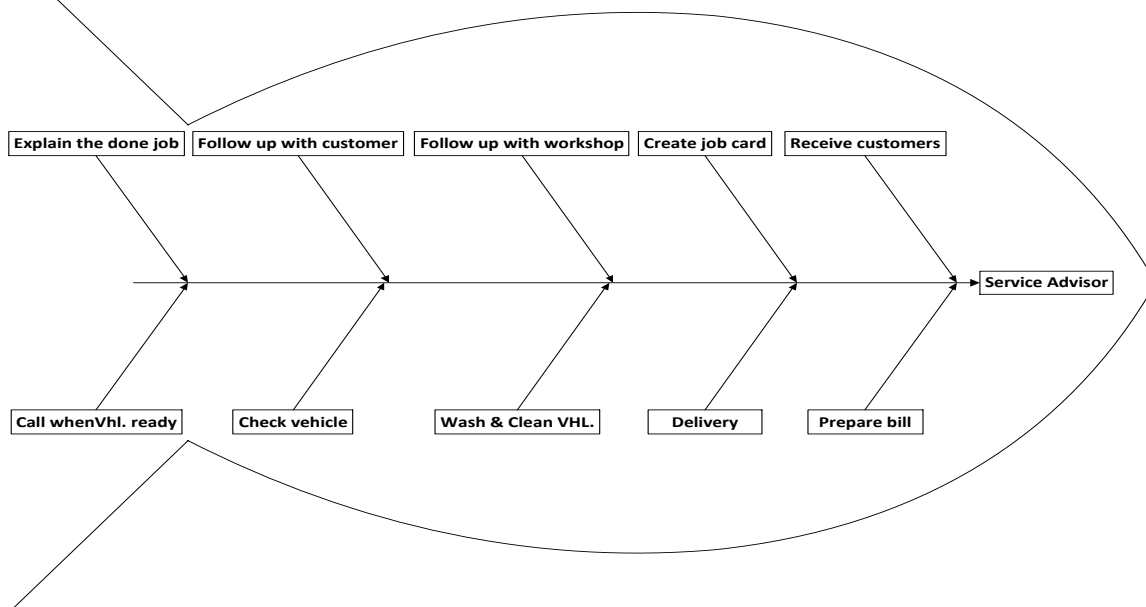


Figure 2: Service advisor tasks and responsibilities

**3.2 VEHICLES' ENTRANCE**

All customers' vehicles are entering from one gate, which causing rush in the entrance gate and may lead to accidents. Then customer park his/her vehicle in the floor space in front of the reception, comes out of vehicle and enter to the reception where service advisors offices are located, but customer has to take a queue number from receptionist and wait his/her turn. Service advisor receives the customer, listen to his/her concern and together walk to vehicle where checking is

taking place for odometer, fuel gauge, body scratches ..etc., after checking is done, service advisor and customer return back to office to create the job card and finish the deal (time taken= 20-30 minutes). Sometimes customer has to go again to his/her vehicle to remove personal stuff before leaving the service center; finally driver moves the vehicle to parking or workshop. If customer decided not to do the work, she/he has to enter vehicle and drive it long distance to the exit gate, which is far away from the entrance area.

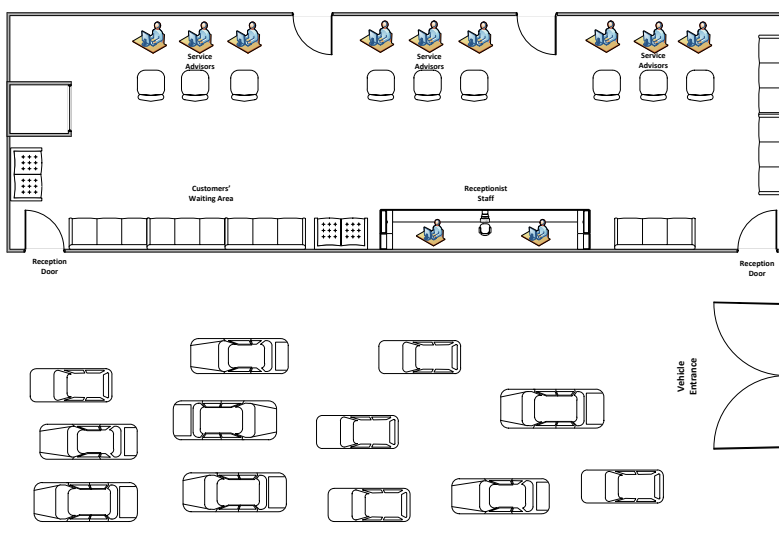


Figure 3: Process Flow Analysis

From the mentioned above lines; we have different kind of wastes: Motion, Waiting, Low closeness rate...etc. illustrated below.

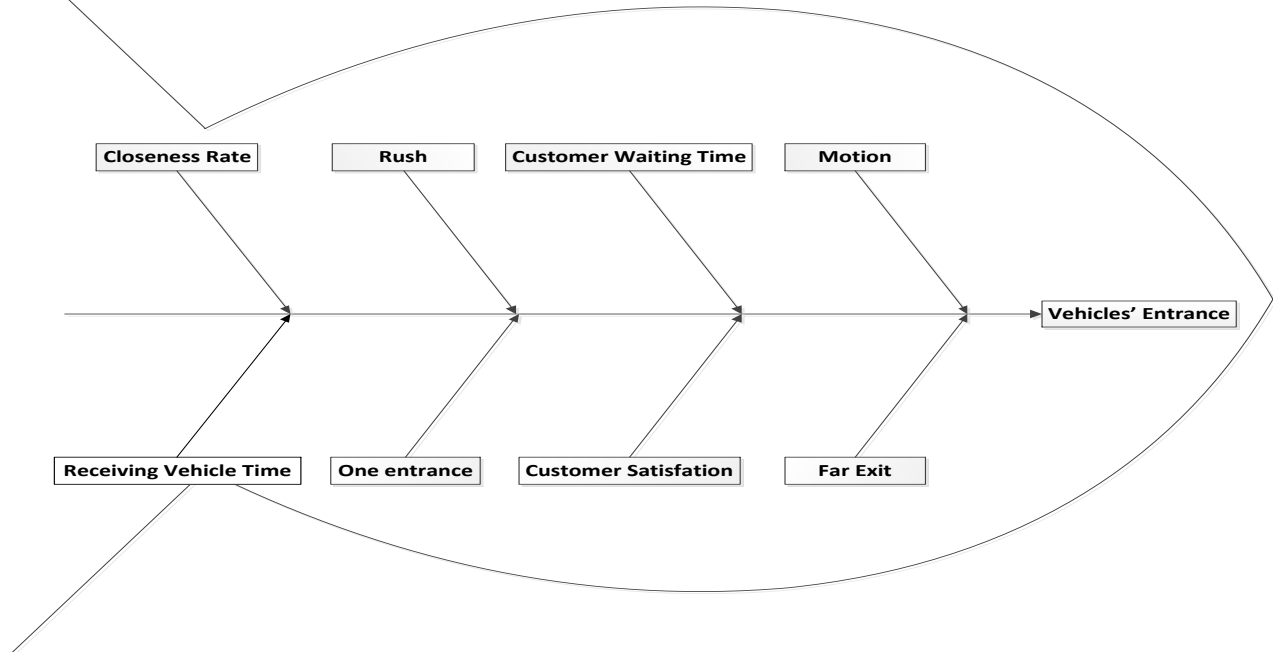


Figure 4: Vehicles' entrance Cause and effect diagram

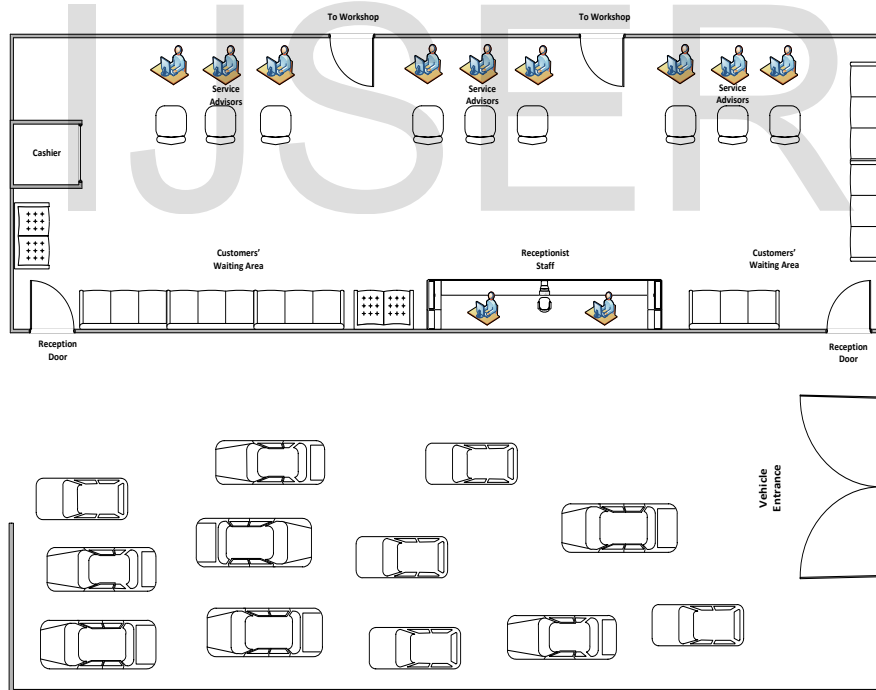


Figure 5: Old vehicle entrance layout

#### 4. METHODOLOGY

We used value stream map or value process map to identify where the bottle neck "wastes" are happening in the service center, develop an initial frame work to address the issues listed, apply lean tools "Ishikawa" diagram to know the causes, apply continuous improvements "kaizen" based on the feedback from

previous points to refine the final frame work represented in Designing an improved layout integrated with the future designed Value Stream Map to achieve the smooth flow of production and overcome the problems that comes from the current layout and the un-organized arrangement of resources.

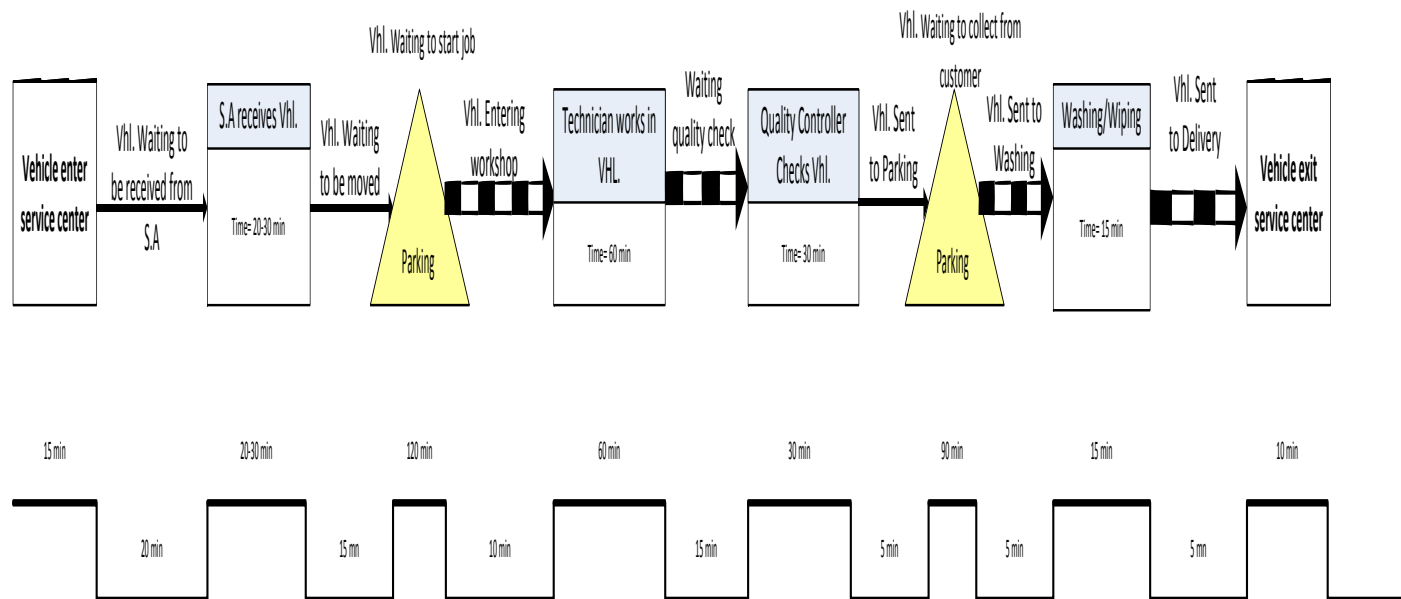


Figure 6: Current value stream map

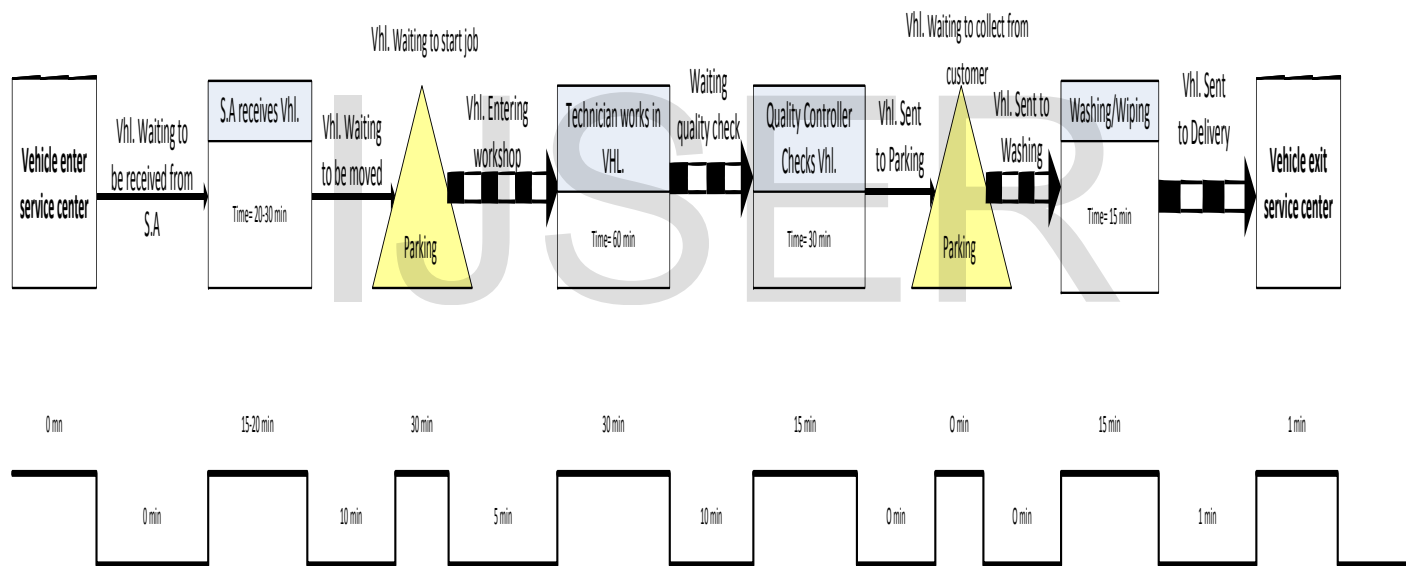


Figure 7: Future value stream map

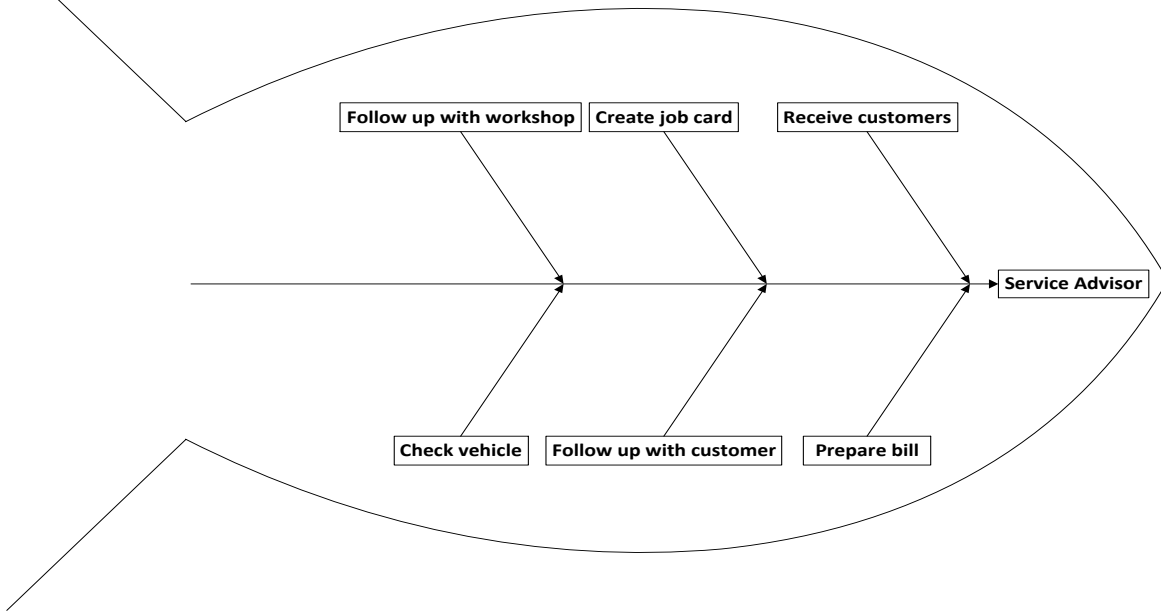
## 5. SOLUTIONS

### 5.1 DELIVERY

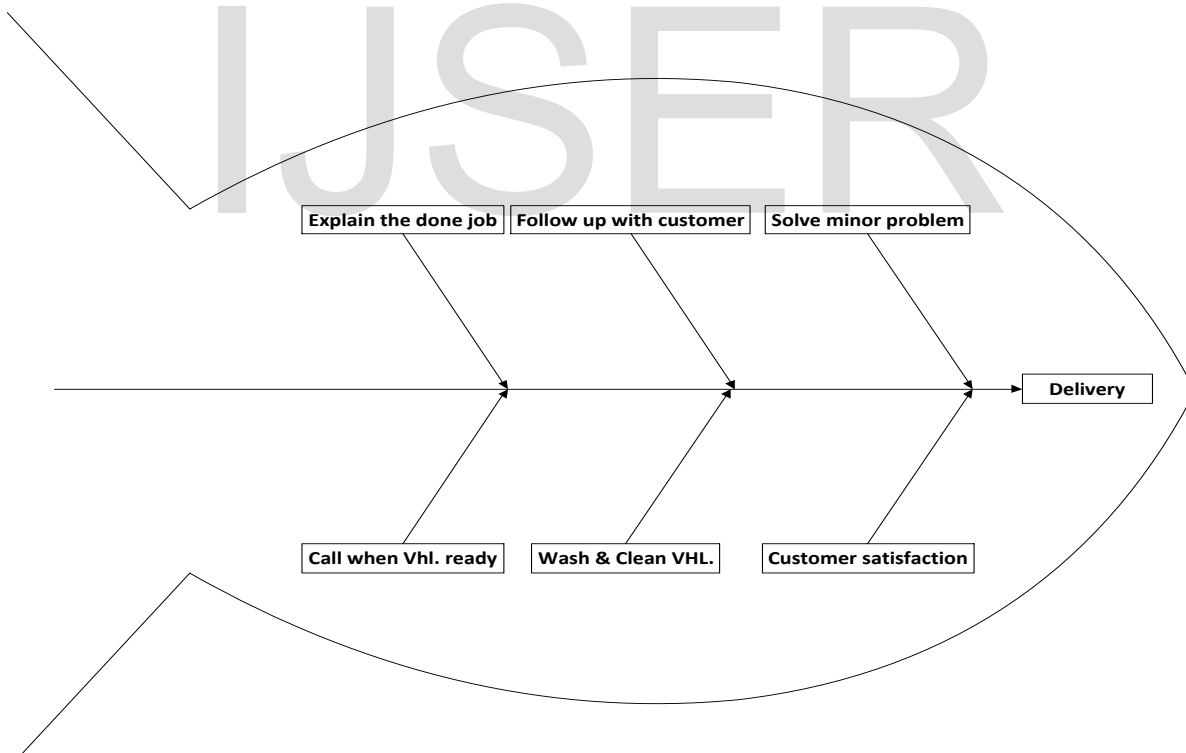
Delivery section was created upon demands towards customer satisfaction, and help service advisors to do their role efficiently as they are the pump of the service center.

Delivery duties including: explain job has been done to vehicles: explain the bills in easy words far away from technical expression to make it easy for customers to understand it and feel the value for their money that paid, try to solve minor problems that happened during collecting vehicles by customers and escalate to

superior the major ones, call customers when vehicle is ready, try to improve delivery mission by asking about the time and date of collecting to avoid bottle neck "a lot of customers are coming to collect their vehicles at the same time", make sure that vehicle is washed and as clean as or more than it was when entered, follow up the service advisor job in case of absence or sick leave, make sure that customers are happy and satisfied about the whole experience by encouraging them to participate in the exit survey, show them the way to cashier and advise for any required future work or next service.



**Figure 8:** Service advisor tasks and responsibilities  
 After creating delivery section



**Figure 9:** Delivery section tasks and responsibilities

**5.2 VEHICLES' ENTRANCE**

Total path is minimized by designing and implementing new vehicle entrance layout, Also, We reduce the resources

from floor space and overall receiving vehicle time to 15- 20 minutes maximum.

Now customers have five entrances to enter their vehicles, in every entrance two service advisors, the new entrance

layout is very similar to petrol station's layout. Customers don't have to come out of their vehicles as service advisor desk is just next to them. Service advisor will check customer's requests and type them down in the computer next to him/her, and make the vehicle walk around check...etc. customer will take his/her stuff from vehicle at the same time. Finally driver moves the vehicle to parking

or workshop. If customer decided not to do the work, she/he has only to turn left till gate# 6 and exit the dealer. Reception is near to the vehicles' entrance area (with new modification like wider space, many seat locations so customers feel comfortable, Free Wi-Fi ...This point is not discussed in this paper).

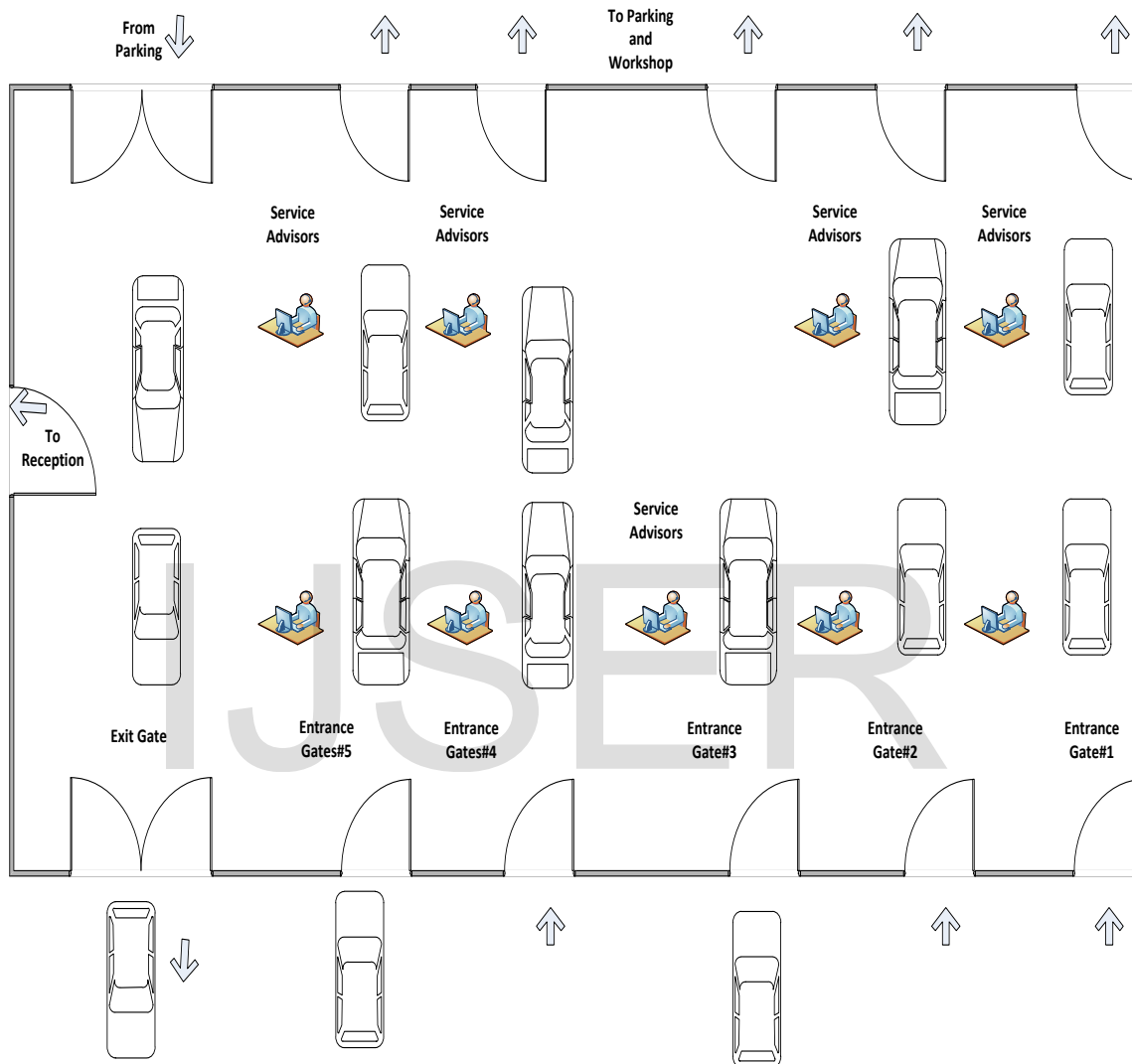


Figure10: New vehicle entrance layout

## 6. DISCUSSION AND CONCLUSION

The purpose of using LEAN tools was to gain customer satisfaction, higher quality product and service, eliminate all kind of wastes in after-sales service center, reduce lead time, use fewer resources "staff, money, floor space ...etc.". LEAN becomes part of the culture when employees at all levels implement it as part of their regular jobs. The first journal publication on the Toyota Production System was authored by Sugimori et al. Their view on effective

production logistics differed fundamentally from the direction taken by many contemporary scientists and production engineers in the USA and Europe. Sugimori et al. criticized the lack of respect for humans in production organizations that were controlled by computerized planning. They stated: "It is not a conveyor that operates men, while it is men that operate a conveyor, which is the first step to respect for human independence."

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