./

Learning Report – Applied System Development Life Cycle and Software Testing



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# NEEDS FOR A CAR

* In this Modern world, managing our personal and professional lives can be hectic. If we do not have your own personal mode of transportation, life can become even more hectic.
* To make our life easier, we should have a reliable and personal transportation.
* The main reason why cars have become a preferred mode of transportation is that it is easier to reach the destination with it and it is more convenient but with a public transport this is not included and
* With cars we have privacy and get a personal liberty to travel to the exact place we need in less time than the former.
* When compared to public transportation, cars are much safer. They come equipped with numerous safety features including airbags, adaptive cruise control, collision detection, lane departure warnings, tire pressure, safety belts and blind-spot monitoring, and brake assist.
* Cars gives a liberty to travel to any place at any time and to take any deviation from the route we are taking.

**MARKET ANALYSIS AND RESEARCH**

* There has been a greater number of cars today than ever before and the need is continuously increasing as the World is modernizing and the standard of living of developing countries has risen since 1990, this boom in economy has encouraged people to buy more cars.
* The price of the car which averages around Rs. 10,00,000 in India is the major driver of the market.
* The need for Petrol Cars are increasing due to government regulations on diesel cars this has created a market.
* The Government duty on imported cars is very kept at higher rates, this has helped create a market for local manufacturers.
* The market demands for a more robust, highly efficient in terms of mileage and all digital packages included.

As mentioned in the needs its almost impossible to imagine a life without a car and the need for having a car is turning out to be a necessity in the broad spectrum of market some players play a huge role in that.

* They may be the Ford motors which is an American multinational and the largest manufacturer of SUV’s and midrange automobiles which includes the Ford Mustang, Ford Figo, Ford EcoSport and more
* Tesla, which manufactures electric cars exclusively along with its driverless feature is a right package in the market. It produces Tesla Model 3 a mid range car and Tesla Model S, Tesla Model Y and Tesla roadster.
* Toyota is a Japanese manufacturer which produces both mid and high end cars which mostly is the second largest manufacturer in the world and huge driver of the market, it produced Toyota Innova, Toyota Fortuner and Toyota Prius.

**TECHNICAL FEASIBILITY.**

* In the given current technology implementing imaginable is very much possible in case of automobile industry for example taking into consideration of any electric car self-driving was almost a failure in case of google and faraday but with Tesla it was a success.
* No matter how efficient a car it can only pack a certain amount of energy in case of a electric car a few hundred miles for a charge and in case of IC cars say a 500 KM for a full tank
* Comparing the features of an auto parking system, Anti-Lock Braking system are readily implemented in just like plug and play.
* Use of Internet to know the location and status of car from a remote location but is impossible to drive it around using the same process due to latency.

**PRODUCT REQUIREMENTS**

* The requirements usually specifies what the product is all about but sometimes the requirements are way different from de-facto requirements.
* Taking an example of a Roll’s Royce car, where a user wanted the manufacturer to fit the interior roofs with gold which may be possible for an automaker which makes less than 5000 cars a year.
* In the general sector of requirements, it usually is what is expected to the current trend unless we a maker makes his own trend.

Again, these requirements can be broken down into High Level and Low Level

* It may be an Anti-Lock braking system (ABS)
* Air bags for both passenger and the driver.
* A Sun roof.
* Power Steering with tilt adjust.

Since these are not universal all the above comes under low level requirements.

* Good pick-up and mileage.
* Seat belts for the driver and the passenger.
* Plug and play multimedia communication with charging ports.
* An extra space for luggage and enough leg space for passengers

Since these are what forms/ defines a car these days it comes under High Level Requirements.

**SWOT ANALYSIS**

SWOT stands for strengths, weaknesses, opportunities, and threats we use it to determine how well can our product perform purely based on these factors.

In case of cars the SWOT analysis is especially important as it determines the range of scalability of the manufacturing and an opportunity that can be exploited

* The key strength in this case is the price which is usually the mid-range or an average which helps customer focus on it and the mileage that the product gives is a key as it is the only thing which makes the car a needful thing.
* The weakness is the one which makes the product more vulnerable in the market and is the one the customer looks out for since it is a burden on him it may be a price or the cost of maintenance etc...
* The opportunity is where the product exploits to make its presence in the market making it a high demand product, in case of tesla car or any electric car manufacturer the rise in trend for the electric car was the opportunity and the reason for that trend may be rise in environmental concerns, auto driving feature etc.…
* The threat in the market is the one that inhibits the product’s competition or its presence in the market it may be some government regulations or new tax slabs for the product or import duties or competition from the rival makers which has better market share than us.

**4 W’s and 1H**

Which is nothing but What, Where, When, Why and How

* **WHAT?**

Cars are nothing but a 4-wheel drive with 4 or more seaters which provides a customer a personal place to drive and to travel, these may be a fuel engine or electric powered this can help you cover distances within a shorter period compared to mass transport, usually used for daily commute.

* **WHEN?**

There arises a need to travel from your location to a certain destination which may be possible from various public transport but will not be feasible if we want to reach a specific location at any time, with personal space.

* **WHY?**

In an evolving world racing with time is a must, and we cannot do that with us depending on the public transport. With raising fare prices for the cabs, it is also not feasible to take an inter-city ride.

* **WHERE?**

From daily commute to an intercity ride for personal use to emergency use, cars have been de-facto standard whether it may be a passion to race or for genuine use it is the private mode of transport.

* **HOW?**

The use of the product involves a person’s input and his complete attention towards the road and his hands on the steering for navigation, speed control, braking etc.… It may also involve switching gears when different speed is required or an acceleration.

**GANTT CHART**

**Chart

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A GANTT Chart is a kind of bar chart which is used to visually represent the project schedule. It has two parts a Vertical and Horizontal, Vertical axis represent each activity to be done on a project and the horizontal represents the time scale required to complete them. It is named after its inventor Henry Gantt.

**UML ON DESIGN AND ARCHITECTURE**

**STRUCTURAL AND BEHAVORIAL**

**STRUCTURAL**

This is what determines what an outer skeleton of a product is, the product may be a high- end and having high number of distinguishing features but it comes under the same category as the others similar products out there, for example an iPhone may distinguish the other phones in the market with faster processor, face lock, but under the hood its still a smartphone which has all the basic features what a regular device would have.

So Structural design can be broken down into 2 parts.

1. **HIGH LEVEL REQUIREMENTS**
2. **LOW LEVEL REQUIREMENTS**

In the High-Level requirements all the requirements that define the product at the basic level is added. In case of a car, it may be a Braking system or an odometer with display system, seat belt system which together with indicator system constitute High Level, and in the same way the air bags system, sunroof system, auto-parking system which are the special characters or a unusual requirements are low level requirements.

**BEHAVIORAL**

Structure determines what the product is made of. Behavior determines what the product should do with that feature say in case of a car the Anti-Lock braking system when applied the car must stop within a certain distance or deaccelerates this is the behavior of that structure.

In the same way as Structural the Behavior can be broken down into 2 parts the High level and Low-level parts.

1. **HIGH LEVEL REQUIREMENTS**
2. **LOW LEVEL REQUIREMENTS**

In High Level behavioral the behavior of the system for a High level requirements is described in case of seat belt indicator system where the indicator indicates if seat belt is worn or not, in the same way the sunroof system which takes an input based on the user to slide open or close is a part of Low level behavioral

**HIGH LEVEL STRUCTURAL**

Diagram

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**LOW LEVEL STRUCTURAL**

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**HIGH LEVEL BEHAVIORAL**

**Diagram

Description automatically generated**

**LOW LEVEL BEHAVIORAL**

Diagram

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