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Product Life Cycle and Quality Planning Oriented Production in Automobile Engineering

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Abstract- the aim of this paper is to demonstrate all the steps of manufacturing of an Automobile, this assists to comprehend the process, logistics and circulation system that an Automobile go through in its Product Life Cycle. The vehicle manufacture takes years of study and Development beginning from planning, testing the product organization from all levels, making sample model, analyzing the sample model, confirming the automobile which is being produced. This paper also illustrates the function of quality planning and life cycle management. Quality planning and administration is about decreasing the unpredictability in goods and operations, quality expenses and to supply highest contentment to the buyers by providing enhanced product performance.

Keywords: - Automobile, manufacture, product life cycle, Quality

I. INTRODUCTION

Automobile Industry is acompound and vibrantindustry in the department of engineering and one of the engineering miracleformed by mankind. Recently there is araise in production of automobile in the industry due to brutalcompetitiveness, producesupply chainalteration, also araise inbuyerdemand. With quickerexpansion in the region,Automotive industry's main issue isrelated withcustomers' requirement for diversity, variant, diversity in design, security,contentment, and inside the industrialdomestictroubleconnected toremoval of contaminant in process, Process effectiveness, productioneffectiveness and progress in completeEquipment Effectiveness. Because of these worldwideapprehension, the majority of the Original Equipment Manufacturersare changing the productionsetting where industryfocus only on heart of themachinery of the Automobileinternally and outsourcing majority of the vehiclemachinery**.** [1]

In the automotive production, there are a bunch ofsteps that starts from the collection ofvariety of materials for the production of theAutomotive. Employees of the automotive companyconduct abunch of experimentation even for designing of a singleconstituent. [2] The modern industry does notsettle for less on the characteristic of the quality of its goodsbybalancingup to the mark standard to flourish in the market.

Quality is a universal concern of producers of goods. Itis afeature that is normallyutilized toshow the level of precision in production ofa produce. It is simple to understand that this level ofprecision is in reverserelative to inconsistencypresent in the procedure. All construction procedurecontainsresources, labor and machinery and it consists mostly component of intrinsicdiversityand also hasaccountable variability, which can beused to make it financially beneficial[3]. Decreasingdiversity in manufacturing is identicalwith increasingvalue of the good.

A. Raw materials

Raw materials must be assembled to convert the automobile from adesign to a reality. Many automobileindustries are looking for more practical, as well as lightweight and quality, materials for their automobiles to flourish in these times of brutal competitiveness.

B. Design & Engineering

Automobile plan must keep in view the public's requirements and desires for an automobile. Once the design is made, it'll go through analysis to perfect it. The insideand outside must be fashioned so that it is eye-catchy to probablecustomer while also consisting of pioneering technologies that make the automobile remarkable and competitive to other companies**.** [4]Miniature models will be prepared in 2Dimension and 3 dimensions to examine the car's design. Engineers will test for aerodynamics, security, weather resistance, fuel saving, electrical function, cost examination etc. Afterthe design and engineering have been permitted, then the production can start.

II. STEP-BY-STEP PROCESS OF MANUFACTURING AN AUTOMOBILE

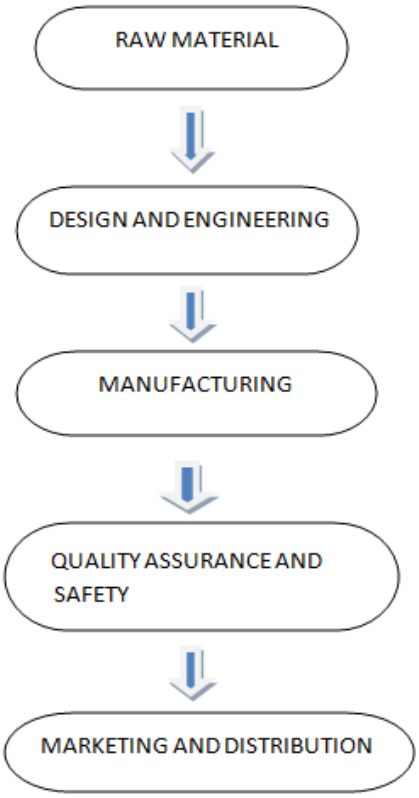

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Fig. 1Flow chart of automobile manufacturing

C.Manufacturing

The metal elements for the framework are shaped and assembled by robots. These components form surface frames,hoods, doors and top of car, which are later oncombined with the mainframe of the automobile. After the frame is made and the constituent are ready to be forged, the automobile will be put on a production line. The automobile will move along a moving assembly line in an industry as robots and workers will work on them. Manufacturing plant employee will put together parts to the car and will work together with robots for some tasks. Robotic labour cells will work without help to fuse, solder, attach, and glue parts onto the automobile. Once the constituent of the body are manufactured onto the automobile, it will go throughdetailing**.** [5] This consists cleaning, layering chemical formulas for guard against decay and scratches. Ultimately, the engine,axles, tires,transmission and exhaust are installed into the automobile.

D. Testing & Quality Assurance

Now that the automobile is all set to drive, it will be examined for quality guarantee and security. The vehicle is tested for any problems or inconsistencies in the internal and external design. The automobile will go through a sequence of tests comparable to those given at a DMV: the engine is ignited several times, the steering configuration is accustomed, the headlights are tested for intensity and reach, brakes are examined for security etc. [6].

1. Then, the automobile will be checked under high water pressure to find leaks.
2. The car's programming will be examined, and the electrical units will be tested to ensure security and user-friendliness.
3. Finally, collision testing will be done to examine how the car reacts to impacts, and to examineairbag and seat belt efficiency.
4. If the car has no further problems in design and is safe to use, then the car can be introduced in the market.

E. Marketing and Distribution

After conducting market research, creating a marketing theme, and deciding the value of the car, the car will be manufactured for car dealerships and private companies to put up for sale to the public.

III. QUALITY PLANNING

Quality drafting is the essential part of total quality control and is a crucialactionintended to prevent quality relatedproblems andconsists of:

1. Making quality goals
2. Incorporating quality in the design
3. Method to measure quality
4. Reduction of defected component
5. Checkingproduct during process and quality ofend product
6. Examination and quality check preparation
7. Management and solving of clientcomplaints
8. Instruction and guidancefor quality standards

Procedures for productionare made by understanding theclientneeds and after these areclearlyanalyzed and it is confirmed that the corporation'spolicy, measures, and goalsare inagreement with the need of client, one maygo on to develop asuccessful quality plan.Balancing the planned design with thecustomer needs, consisting of dependability andmaintenanceneeds, confirms designefficiency.[7]

IV. PRODUCT LIFE CYCLE MANAGEMENT

Managing product supply chain is theaction of supervising a brand's productwith lots ofEfficiency all along thesupply chain. This permitsacorporation to takeovercharge of its goods. With thegoods becoming more compound,clients becoming extra demanding, need for havingless product manufacture time, andatmosphere of competition in the marketplace, modernization, subcontracting of product manufacture, modification to meetclientneeds, product increased long life, PLM [8] supports inbringing improvedgoods in the minimum time possible to the marketplace,gives improvedclientassistance and decreases thevalue of a product.

PLM aids inincreasing theworth of a product regarding its supply chain. Allcorporations are requiredto administerinteractions and data with theirclients through clientRelation Managementprovidedwith the help of Supply Chain Management (SCM).Resource planning within the company helps in asset management. Aproductionindustry has to expand, explain, handle and communedata about their goodswith the help of PLM and also PLM aids indecrement in the time ofmanufacture of goods,betterment of productefficiency, decreasesmodel sampleexpenses, helps ininvestmentsby the recycling of information, decreasescontaminant, and leads toefficient use of money inthe wholeamalgamation of engineering processesand thereforegives a outline for goods optimization [9].The heart of PLM is in the formation and centricadministration of all goodsinformation and the machineryutilized to get this data and information.

V. CONCLUSION

In this paper,the step by a step manufacturing procedure of an Automobile andquality and life cycle oriented production engineering hasbeen discussed.Automobile sectoris blooming gradually worldwide, and with raise in customerrequest forarray of alternatives in Automotive it is imperative to comprehendthe course and intricacy of Automotive in bidto decrease the manufactureperiod for quickermanufacture, improved utilization of machinery and anincrement in overall effectiveness of equipment.

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