



# PROCEDURE REPRODUCTION AND IMPROVEMENT OF AUTOMOTIVE PAINT SHOP

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## ABSTRACT

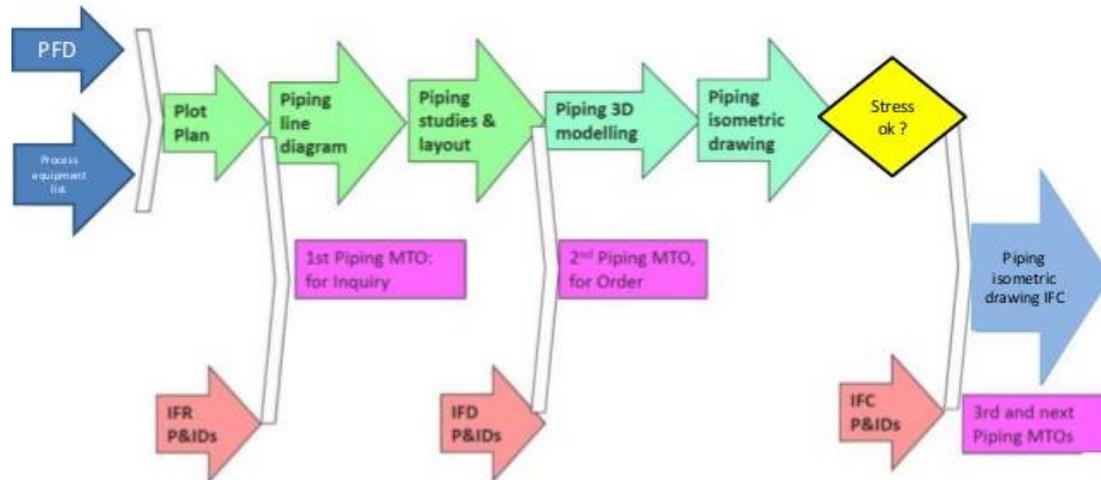
*The automotive business in Kingdom of Thailand is underneath constant pressure to enhance production performance whereas at the same time eliminating production bottlenecks and up method potency. The demand of automotive grows on a daily basis. Then just in case of the unbeatable assembly line, it's terribly troublesome to manage and optimize the assembly system while not perturbing the particular system. method simulation is appropriately applied for finding out and analyzing the system. This analysis presents a way to implement simulation tools within the real production designing. Our goal is to scale back the bottleneck downside in an exceedingly paint look method. The procedure starts with input file assortment, information fitting. Then simulation model building, model validation, Identification of bottlenecks, and developed strategies to enhance production performance consequently.*

## 1. INTRODUCTION

WITH the growing demand for luxury cars within the association countries, one among the massive German automotive firms in Kingdom of Thailand is forced to extend the assembly capacities during this region. the corporate predicts Associate in Nursing increasing in production of concerning two hundredth within the returning years. therefore Thonburi Automotive manufacturing plant (TAAP) is that the partner of them in Kingdom of Thailand as approved computer program of completely-knocked-down (CKD) rider cars, TAAP realizes to early inure it. to attain the assembly target, a customary time of ten minutes per digital computer must be achieved. However, essentially several workstations cannot reach this point. so TAAP is functioning terribly intensively to optimize the assembly line. Associate in Nursing automotive manufacturing plant of TAAP has 3 major sections with regard to the stages of the assembly process: Body look, Paint look and Final assembly (See Fig. 1). one among major bottlenecks is that the paint look, that was put in concerning twenty years past. Except the dipping method, all alternative major processes within the paint look need fifteen to twenty minutes every. The longest civil time seems within the high coat painting digital computer with concerning twenty minutes. This paper extracts a number of the analysis to debate the utilization of model to style and cut back the bottleneck within the high coat painting method.

## 2.BACKGROUND

The painting processes begin once the body of car is assembled. the aim of this processes square measure to relinquish a lot of enticing look to the vehicles and to supply the layer of protection against corrosion and weathering. There square measure four major processes in painting processes; (a) pre-treatment and electro-deposition (ED), (b) PVC protection, (c) primer painting and (d) high coat painting [2]. This paper can specialise in the highest coat painting method because it is that the biggest downside within the production. The TAAP's high coat method has many steps, for instance surface improvement, dirt processing, wiping, painting and nail down with baking. the entire diagram is shown in Fig. 2 and Fig. 3. Except the paint baking kitchen appliance, each method needs manual human operators.



**Fig:-1** The work flow of the top coat process

### 3. OBJECTIVE

The simulation and analysis of various forms of systems was conducted for the needs of: developing in operation or resource policies to enhance system performance and testing new ideas before implementation while not perturbing the particular system. the most plan for optimizing this production system is to arrange the station and cut back the bottleneck within the system to create the higher work flow. The Siemens PLM computer code, Tecnomatix Plant Simulation was utilized in this study [3].

### 4. MODEL VALIDATION

The applied mathematics information were applied to the simulation computer code, Tecnomatix Plant Simulation, to model the system and to represent the particular method, as shown in Fig. 5. The model can not be with confidence used if it's not valid. The model validation is that the method of insuring that the model represents reality [6]. applied mathematics validity was performed by statistically scrutiny the output from the particular system with the information from the model that was developed victimization the computer code. The twenty samples from the system and also the model were collected and tested for a null hypothesis by Minitab. The t-test was accustomed confirm applied mathematics significance. The ensuing t price of one.01 was between the important values of - two.093 and +2.093 at 0.05 levels of serious. as a result of the model wasn't statistically considerably completely different from the particular system, it had been thought-about to be valid.

### 5. BOTTLENECK IDENTIFICATION

The helpful feature of the computer code is ready to displays the applied mathematics information of station utilization that was recorded throughout the simulation run [3]. the placement of the bottleneck was known by the share of obstruction. the information facilitate programming and coming up with the new models which can be shown within the following topic.

### 6. EXPERIMENTAL

Styles 3 coming up with different models were conducted from the Model A (See Fig. 6) that represents a gift production method to enhance the performance of the prevailing system. the varied alternatives during this analysis targeted on rearranging the workstations, dividing the task of every station and reducing the bottleneck within the system to create the higher work flow. every different was analyzed within the read of sensible practicableness and no effecting to the standard of item with regard to employees and engineers' opinions.

One major bottleneck of Model A appeared at the bottom coat station (See Fig. 10) that is that the method of 2 layers base coat painting. One risk to scale back the interval of it's to divide the tasks of the station into 2 stations, the area at base coat station is employed for the primary layer painting and also the area at the bottom coat color set station is employed for second layer painting and color setting as diagrammatical by Model B that illustrated.



The last different is Model D, it had been thought-about to scale back all major bottlenecks within the system. With regard to Model C, to scale back the interval of Base coat1 station, the examination task was split from Base coat1 station and Blow-off station was removed and was replaced with Base coat1 station

## **7. RESULTS AND CONCLUSION**

Four models were run with TAAP's operating hours (eight hours of 2 shifts with one hour break time every shift) in condition of decent variety of employees.

The performance of models was measured by variety of throughputs per day. The result clearly showed that Model D performs higher than alternative alternatives. Bottlenecks within the system were reduced and achieved higher work flow, by scrutiny with Model A and Model D as illustrated in Fig. 10 and Fig. 11. However, this report was simply incontestible the tactic to search out the higher answer. If the model are going to be chosen to use, the value analysis ought to be thought-about additionally.

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