

# Modeling and simulation of production workflow at manufacturing company

by ARENA software system

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## ABSTRACT

This study is investigating the production workflow in manufacturing company to know their performance to produce the product. ARENA software was used for the model development as well as simulating the current performance and scenario analysis. Its to identify the potential bottlenecks occur in the plant and to suggest the production improvement using scenario analysis. Through the model, study also able to know the plant capacity , queue length and other. A series experiment known as “what if analysis” was done to the system as way to increase system performance, production and better decision to the operation.

## INTRODUCTION

- This study the simulation model is use to develop the workflow of organization toward the productivity performance.

## OBJECTIVE/S

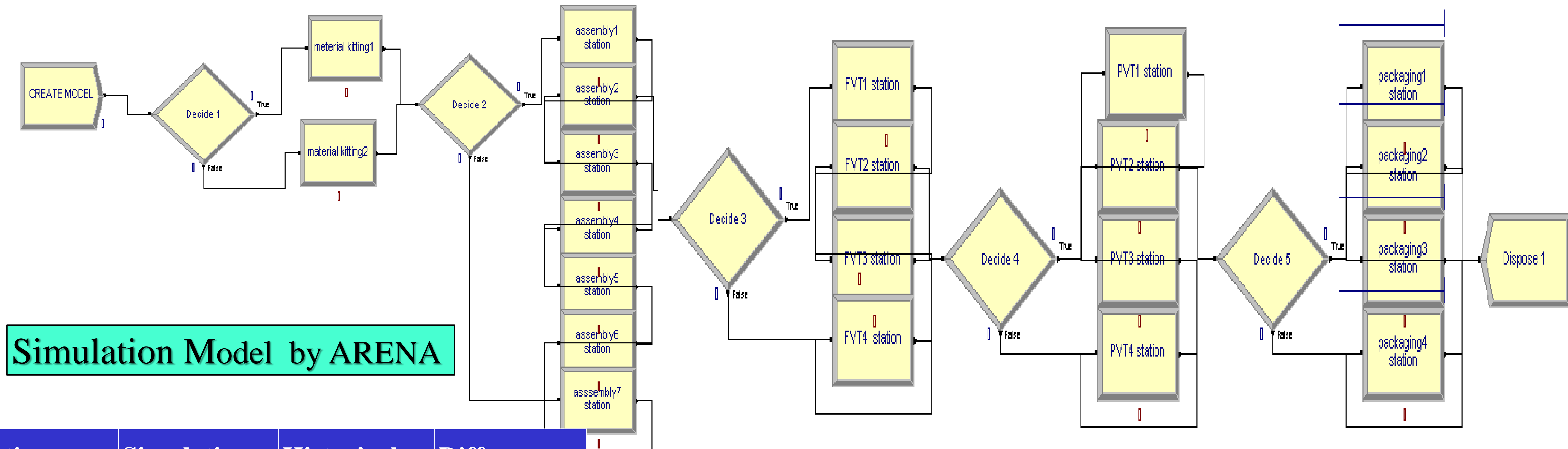
- To develop a simulation model to enhance the workflow performance in production.
- To identify the potential bottlenecks occurs on the plant
- To suggest the production improvement using scenario analysis

## METHODS

### ARENA simulation modelling software

- ☐ Discrete event system
- ☐ Data Collection
  - Observation-This method is observed the process involved in operation at the plant.
  - Interview-The data are also collected through an interview with relevant people whom responsible at the plant were conducted
  - Historical data-The data are also referring to the data from the historical record of the company factory in certain period

## Model Simulation



Simulation Model by ARENA

Stations	Simulation output(min)	Historical data(min)	Difference
Material kitting	8.1	11.49	3.39
Assembly component	31.5	35.09	3.59
Functional Verification test(FVT)	33.0	35.09	2.09
Product verification test(PVT)	9.7	14.83	5.13
Packaging	7.3	14.83	7.53

### Validation and Verification

Difference (%)=simulation output(-)actual data divide by actual data and multiply 100  
 $373-340=33$ .....step 1  
 $33/373*100=8\%$  ..... step 2  
(validation)

Difference result is below 10% so that follow the condition.

### Scenario analysis

- Scenario 1:Reduce 9% quantity printers order at station 1(material kitting)-The waiting time decreases 1.05 minute.
- Scenario 2:Remove 4 number working line for station 2 (component assembly)-The output number increases to 93.
- Scenario 3 Make combination both scenario-increases 25% throughput.

## CONCLUSIONS AND RECOMMENDATION

When bottleneck happen it causes the production activity slow and cannot get the right productivity for the company target or aims. The waiting time and queue is decreases by 1.05 minute by the changes that reduce 9% quantity printers order at station 1, remove 4 numbers working line station 2 to reduce the bottleneck happen and the waiting to increase the production of printer. The company should always up to date the new technology that can make the better way of production and create one system that can know effectively if any problems can occurs in the production line. In future the company can always move forward to compete with others manufacturing company in the world.